PSL UNIVERSITÉ PARIS

THÈSE DE DOCTORAT
DE L'UNIVERSITÉ PSL

Innovation in Financial Services Industry: Comparative Case-studies of Large Commercial Banks and Giant FinTech Firms in China

Supported by

Kok Lian, WOO

Doctoral School ED 543

SDOSE doctoral school

Specialty

Management Science

Jury composition:

Antoine, RENUCCI
Professor, *Université de Pau et des pays de l'Adour, Rapporteur*

Veronique BESSIERE
Professor, *Université* de Montpellier, *Rapporteur*

Pierre, ROMELAER
Professor, Université Paris-Dauphine-PSL, Président du jury

Christine MARSAL
Maîtresse de Conférences, *Université de Montpellier, Rapporteur*

Herve ALEXANDRE
Professor, *Université Paris-Dauphine-PSL, Directeur de Thèse*

Dauphine | PSL UNIVERSITÉ PARIS

Abstrait

Cette étude vise à comprendre le processus et le modèle d'innovation financière adoptés par les grandes banques commerciales et les grandes entreprises FinTech opérant en Chine. Une étude qualitative basée sur un modèle de processus et une vision épistémologique interprétiviste ont été appliquées dans cet article. Six banques ont été sélectionnées pour des études de cas étendues et multiples en utilisant une méthode de «mise à l'échelle de la différence maximale» pour identifier les thèmes et modèles clés. Les principales théories appliquées dans cette étude sont les théories de l'innovation et du changement institutionnel.

Les résultats suggèrent que chaque banque de cas a adopté une approche et un processus d'innovation financière différents. Le choix du modèle d'innovation dépend de la structure institutionnelle, de la propriété, de la trajectoire, du modèle commercial, de l'approche réglementaire et des objectifs d'innovation de la banque de cas. Chaque entreprise a entrepris une voie différente de changement institutionnel et leurs choix ont affeszie
cté collectivement l'arrangement institutionnel global. Nous avons trouvé des preuves de modèles d'innovation BankTech et FinTech conduits respectivement par de grandes banques commerciales traditionnelles et des entreprises FinTech. Le premier entend conserver son influence traditionnelle sur le marché et son monopole, tandis que le second vise à redéfinir les arrangements institutionnels pour établir un nouveau modèle de service bancaire. Les résultats ont également révélé diverses formes de changements institutionnels dans le système bancaire chinois, y compris la conception institutionnelle et la diffusion des prêts P2P, le paiement mobile et la distribution en ligne de produits financiers en Chine, l'adaptation institutionnelle de l'innovation centrée sur l'utilisateur et les actions collectives institutionnelles vers une banque ouverte. modèle.

En témoigne l'expérience de la réforme bancaire en Chine au cours des 20 dernières années, un modèle de progression institutionnelle a été utilisé pour expliquer comment les arrangements institutionnels évoluent et progressent vers l'équilibre. L'isomorphisme institutionnel restera stable jusqu'à ce qu'il soit perturbé par les pressions institutionnelles. Le modèle de progression institutionnelle aide à répondre aux questions de savoir ce qui appelle un changement institutionnel, pourquoi l'institution adopte une voie différente de changement et comment l'arrangement institutionnel passe d'un état à un autre.

Mots clés

Changement institutionnel | Innovation financière | Dialectique de régulation | Banque chinoise et FinTech

ABSTRACT

This study aims to understand the financial innovation process and model adopted by large commercial banks and large FinTech firms operating in China. A qualitative study based on process model and an interpretivist epistemological view were applied in this paper. Six banks were selected for extended and multiple case studies using a "maximum difference scaling" method to identify key themes and patterns. The main theories applied in this study are innovation and institutional change theories.

The findings suggested that each case bank adopted a different financial innovation approach and process. The choice of innovation model is affected by the case bank's institutional structure, ownership, trajectory, business model, regulatory approach and innovation objectives. Each firm undertook a different path of institutional change and their choices collectively affected the overall institutional arrangement. We found evidence of BankTech and FinTech innovation models driven by large traditional commercial banks and FinTech firms respectively. The former intends to conserve their traditional market influence and monopoly, while the latter aims to redefine the institutional arrangements to establish a new banking service model. The findings also revealed various forms of institutional changes in China's banking system, including institutional design and diffusion of P2P lending, mobile payment and online distribution of financial products in China, institutional adaptation of user-centric innovation, and institutional collective actions towards an open banking model.

Evidenced by China's banking reform experience over the past 20 years, an institutional progression model was used to provide an explanation to how institutional arrangements evolve and progress toward equilibrium. Institutional isomorphism will remain stable until being disordered by institutional pressures. The institutional progression model helps answer the questions of what invoke an institutional change, why institution adopts a different path of change and how institutional arrangement moves from one state to another.

Keywords

Institutional Change | Financial Innovation | Regulatory Dialectic | Chinese Bank and FinTech

DECLARATION

I solemnly declare: The submitted thesis is the result of my independent research under the guidance of my supervisor. To the best of my knowledge, unless already noted, the contents of references and the research results of this thesis do not contain any copyright content of other people. Other individuals and organizations who contributed to the thesis have all been clearly acknowledged in the thesis.

Signature：_____Date：_____

CONFIDENTIALITY AND AUTHORISATION

There is a need to protect the confidentiality of information provided by the interviewees and their organizations. For this reason, the data and other materials included in the thesis have been presented in such a way as to protect the interests of the participants.

Furthermore, the author is fully aware of and understands the relevant policies of Université Paris-Dauphine regarding the reservation and usage of the thesis. Specifically, the University has the right to retain copies of the thesis and allow the thesis to be accessed and borrowed; the University may publish all or part of the contents of the thesis; and the University may save the thesis by photocopying, microprinting or other means.

Signature：_____ Signature of Supervisor：_____ Date：_____

Acknowledgements

The completion of this PhD study was made possible thanks to those who inspired me along the way. Special thanks go to my advisor, Professor Hervé Alexandre, for being my steady anchor throughout the whole process. Prof. Alexandre gave me tremendous support, both professionally and personally. He read and provided critical comments on all my revised manuscripts, regularly engaged in lengthy discussions with me over zoom calls, and showed me tremendous patience. Most importantly, he taught me what good research is all about. I am also especially indebted to the pre-defense committee members for their challenging and critical, yet, insightful and constructive comments. The process of meeting their challenging demands was certainly one of substantial learning for me. I am equally grateful to the all the senior executives, officers and professionals of the case banks who made time to participate in my study.

A large academic network has contributed to my PhD learning. Many thanks to Université Paris-Dauphine for its guidance and company along my academic journey. I am thankful to Professors Anne-Laure Mention and Marko Torkkeli for commenting on my manuscript published in the *Journal of Innovation Management* (2017) and introducing me to join the innovation and professional networks. I owe a debt of gratitude to Professor Bernard Fernandez, who remained supportive. Besides, I could not have completed this study without the support, encouragement and assistance from my PhDmates. I have faith that our friendship will continue after the completion of this program.

A major part of my research journey was a lonely and tremendously frustrating process of daily struggles with the nitty-gritty details of research. I was continuously dealing with the unknown - finding a way, reading yet some more, re-examining, reconstructing, and re-writing again and again. I kept shifting between theories, practices and models in order to understand the world of innovation management and regulatory dialectic. Lastly, I would like to thank my family for always supporting my choices. Their support gave me confidence and strength to realize what I set my mind to.

Table of Contents

Acknowledgements **0**
List of Figures **5**
List of Tables **7**
List of Abbreviations **8**
Chapter 1: Introduction **11**
1.1 Financial Innovation Issues in China's Banking System 12
1.2 Research Objective, Questions, Significance and Epistemological Approach 18
1.3 Structure of This Thesis 19
Chapter 2: Literature Review **20**
2.1 Financial Innovation 20
2.1.1 Definition 21
2.1.2 Empirical Results 24
2.2 Institutional Change Theory 36
2.2.1 Institutional Design 42
2.2.2 Institutional Adaptation 52
2.2.3 Institutional Diffusion 56
2.2.4 Collective Action 60
2.3 Innovation and Regulatory Debate 73
2.4 Summary 77
Chapter 3: Research Methods **79**
3.1 Research Design 79
3.1.1 Case Study 80
3.1.2 Pilot Study or Exploratory Interview 86
3.2 Case Selection and Research Setting 92
3.2.1 Case Firms 93
3.2.2 Participants 99
3.2.3 Data and Theoretical Saturation 100
3.3 Data Collection 102
3.3.1 Interviews and Written Materials 103
3.4 Data Analysis 107
3.4.1 Within-case Analysis 109

3.4.2 Cross-case Analysis 111
3.5 Research Reliability 114
3.6 Ethical Considerations 116
3.7. Summary 118
Chapter 4: China's Banking Reform 119
4.1 Early Stage of China's Banking Reform (1949 to 1997) 119
4.2 Modern Stage of China's Banking Reform (1998 to 2020) 123
4.3 Key FinTech Developments in China 132
4.3.1 Peer-to-Peer (P2P) Lending in China 132
4.3.2 Mobile Payment in China 136
4.3.3 Online Financial Product Distribution in China 137
4.3.4 FinTech Impacts on Regulation and Innovation 139
4.4 Financial Liberalization and Its Impacts 141
4.4.1 Liberalization of Bank Interest Rate 141
4.4.2 Internationalization of Renminbi (RMB) 142
4.4.3 Liberalization of Financial Market and Access 143
4.11 Summary 145
Chapter 5: HSBC Case Study 146
5.1 Business Environment 148
5.2 Business Strategy 150
5.3 Business and innovation performance 153
5.4 HSBC: Aspects Related to Research Questions 155
5.4.1 Financial Innovation Process 155
5.4.2 Regulatory Dialectics Reconciliation 160
5.4.3 Financial Innovation Management 164
5.5 Summary: An Actor-networked Innovation Process 167
Chapter 6: CCB Case Study 171
6.1 Business Environment 174
6.2 Business Strategy 176
6.3 Business and Innovation Performance 178
6.4 CCB: Aspects Related to Research Questions 180
6.4.1 Financial Innovation Process 180
6.4.2 Regulatory Dialectics Reconciliation 186
6.4.3 Financial Innovation Management 187

6.5 Summary: A “Layered Responsible” Innovation Process 192
Chapter 7: Ping An Bank Case Study 199
7.1 Business Environment 200
7.2 Business Strategy 204
7.3 Business and Innovation Performance 207
7.4 Ping An: Aspects Related to Research Questions 212
7.4.1 Financial Innovation Process 213
7.4.2 Regulatory Dialectics Reconciliation 218
7.3.3 Financial Innovation Management 221
7.5 Summary: An Interactive Concurrent Innovation Process 227
Chapter 8: MYbank Case Study 234
8.1 Business Environment 236
8.2 Business Strategy 245
8.3 Business and Innovation Performance 249
8.4 MYbank: Aspects Related to Research Questions 250
8.4.1 Financial Innovation Process 251
8.4.2 Regulatory Dialectics Reconciliation 262
8.4.3 Financial Innovation Management 266
8.5 Summary: An Agile situational-based Innovation Model 273
Chapter 9: WeBank Case Study 278
9.1 Environment 280
9.2 Business Strategy 282
9.3 Business and Innovation Performance 285
9.4 WeBank: Aspects Related to Research Questions 291
9.4.1 Financial Innovation Process 291
9.4.2 Regulatory Dialectics Reconciliation 300
9.4.3 Financial Innovation Management 303
9.5 Summary: An Open Banking and Micro-innovation Model 311
Chapter 10: Du Xiaoman & aiBank Case Study 314
10.1 Business Environment 318
10.2 Business Strategy 323
10.3 Business and Innovation Performance 326
10.4 The Fall of Du Xiaoman 328
10.5 Baidu Finance: Aspects Related to Research Questions 332

10.5.1 Financial Innovation Process 333
10.5.2 Regulatory Dialectics Reconciliation 338
10.5.3 Financial Innovation Management 340
10.6 Summary: A User-centric Innovation Model 343
Chapter 11: Cross-case Comparisons 345
11.1 Answering the Research Questions 347
11.1.1 Innovation Process and Model 347
11.1.2 Regulatory Dialectics Reconciliation 354
11.1.3 Financial Innovation Management 357
11.1.4 Innovation Learning and Competency Development 360
11.2 Institutional Change in China's Banking System 364
11.2.1 Major Events and Key Institutional Change Actors in China's Banking System 364
11.2.2 Impacts of Regulation and Innovation on Institutional Changes 370
11.2.3 Institutional Design and Diffusion: Branchless Banking Model in China 372
11.2.4 Institutional Diffusion: P2P Lending, Mobile Payment and Online Distribution 390
11.2.5 Institutional Adaptation: User-centric Innovation 397
11.2.6 Collective Actions: Cross-industry Co-creation in China 404
11.3 Summary 413
Chapter 12: Discussions and Conclusion 414
12.1 Regulation: A Catalyst or a Hindrance to Financial Innovation 414
12.2 Determinants: Financial Innovation and Performance 415
12.3 Multidisciplinary Project Team's Impacts on Innovation Performance 417
12.4 Customers' Involvement in the Financial Innovation: Easier Said than Done 418
12.5 Institutional Progression Model: A Process Approach to Institutional Change Theory 420
12.6 Academic Implications 425
12.7 Managerial Implications 426
12.8 Limitations 428
12.9 Suggestions for Future Research 429
Appendix 1: Interview Guide 430
Appendix 2: An Overview of Participants 433
Appendix 3: Data Collection Details 434
Bibliography 437

List of Figures

Figure 3-1 Cross-case analysis structure 113
Figure 4-1 China's mono-bank system (1949-1977) 120
Figure 4-2 China's two-tiers banking system (1978-1993) 122
Figure 4-3 China's three-tiers banking system (1994-1997) 123
Figure 4-4 China's three-tiers banking and AMC systems (1998-2002) 125
Figure 4-5 China's modern banking system with foreign interest (2003-2007) 127
Figure 4-6 China's modern banking system with diversification (2008-2012) 129
Figure 4-7 China's modern banking system with FinTech and CBIRC (2013-2020) 131
Figure 5-1 Financial innovation process at HSBC 159
Figure 5-2 The actor-networked innovation model at HSBC 168
Figure 5-3 Innovation process: The "Behavioral" model 169
Figure 6-1 Financial innovation process at CCB 182
Figure 6-2 Innovation performance assessment at CCB 191
Figure 6-3 "Layered approach with vertical communications" (macro level) 193
Figure 6-4 The "rational" innovation model (micro-level) 196
Figure 7-1 Ping An's Organizational Structure 200
Figure 7-2 Market Share by Types of Banks in China (2019) 201
Figure 7-3 Ping An's development strategy 204
Figure 7-4 Ping An Top-down Innovation Process 214
Figure 7-5 Ping An Bottom-up Innovation Process 215
Figure 7-6 Ping An Traditional Waterfall or Sequential Innovation Process 216
Figure 7-7 Ping An Interactive Concurrent Innovation Process 217
Figure 7-8 Ping An Innovation and Compliance Reconciliation Model 220
Figure 7-9 Ping An Innovation Management Approach 223
Figure 7-10 Ping An Integrated Marketing and Service Platforms 226
Figure 7-11 Ping An Innovation Competence Development Approach 227
Figure 7-12 Simplified Scheme of Nonaka's (1990) "Concurrent Engineering" 228
Figure 8-1 Alibaba Group Structure - MYbank 235
Figure 8-2 FinTech ecosystem of MYbank 235
Figure 8-3 Alibaba's Self-developed Sesame Credit System 250
Figure 8-4 MYbank innovation process 256
Figure 8-5 MYbank agile development method 257

Figure 8-6 “SPRINT”Innovation model 260
Figure 8-7 Alibaba / MYbank Organizational Change Process 267
Figure 8-8 MYbank’s project management approach in product development 269
Figure 8-9 Innovation process: The “Progressive” model with “intrapreneur" 275
Figure 9-1 WeBank’s Weilidai 278
Figure 9-2 WeBank’s Wechedai 279
Figure 9-3 WeBank’s concepts of branchless banking 282
Figure 9-4 WeBank’s FinTech patents 287
Figure 9-5 WeBank’s Open Banking Model 292
Figure 9-6 Chesbrough’s Open Innovation Concept 294
Figure 9-7 WeBank’s Inclusive Finance Concept 295
Figure 9-8 Micro-innovation Process 296
Figure 9-9 WeBank’s Collaborative Network Approach 310
Figure 10-1 Baidu Finance 315
Figure 11-1 The role of regulation in the institutional field changes 371
Figure 11-2 The role of innovation in the institutional field change 372
Figure 11-3 The degree of branchless banking 373
Figure 11-4 FinTech operation model (conceptualized based on MYbank) 376
Figure 11-5 FinTech system architecture (conceptualized based on MYbank) 378
Figure 11-6 The BankTech operation model (conceptualized based on Ping An) 384
Figure 11-7 The system architecture of the BankTech model 386
Figure 11-8 The user-centric innovation model 400
Figure 12-1 Institutional Progression Model 421

List of Tables

Table 2- 1 Four main definitions of innovation..... 20
Table 3-1 Case-studies banks (traditional banks and FinTech firms) 97
Table 3-2 Models of saturation and their principal foci in the research process..... 101
Table 4-1 CPC Central Committee's Decision on Major Issues Concerning Comprehensively Deepening Reforms..... 131
Table 5-1: Process comparison between two types of innovation products..... 158
Table 8-1: Competitive strengths of traditional banks and FinTech 239
Table 8-2: A comparison between traditional banking and FinTech 240
Table 8- 3 Development comparison between a mobile application and a FinTech product. 251
Table 8-4: A comparison between Chinese and Japanese borrowed innovations 259
Table 8-5: Comparison between adaptive and predictive innovation development..... 274
Table 11-1: Traditional and Direct Banks Comparison..... 346
Table 11-2: A comparison of innovation approaches and processes 349
Table 11-3: Generic innovation characteristics: Traditional Banks Vs. Direct Banks 353
Table 11-4: A summary of the changes in institutional arrangement (2010-2020) 364
Table 11-5: Major antecedents and consequences of institutional field change (2010-2020) 367
Table 11-6: Key actors in institutional change and their respective roles (2010-2020)..... 369

List of Abbreviations

ABC: Agriculture Bank of China

ABCD: A.I., Blockchain, Cloud Computing and Big Data

AIIB: Asia Infrastructure Investment Bank

API: Application Programming Interface

BOC: Bank of China

CBA: China Banking Association

CBIRC: China Banking and Insurance Regulatory Commission

CBRC: China Banking Regulatory Commission

CCBs: City Commercial Banks

CDS: credit default swaps

CIRC: China Insurance Regulatory Commission

CPC: Communist Party of China

CRC: Credit Reference Center

CRM: Customer Relationship Manager

CUP: China Union Pay

DFA: Dodd-Frank Wall Street Reform and Consumer Protection Act

ECM: extended case-method

ETF: exchange-traded fund

FATE: Federated AI Technology Enabler

FDI: foreign direct investment

FISCO: Financial Blockchain Shenzhen Consortium

FOSS: free and open-source software

FSA: Financial Services Authority

FSG: Financial Services Group

FSI: foreign strategic investors

GBM: Global Banking and Markets

GPL: General Public License

GPCM: Global Payments and Cash Management

GTRF: Global Trade and Receivable Finance

HFT: high-frequency trading

HKBAN: Hong Kong Business Angel Network

HKSTP: Hong Kong Science and Technology Parks Corporation

IMF: International Monetary Fund

JSCBs: Joint-Stock Commercial Banks

JVM: Java virtual machine

KPI: key performance indicator

LCBs: Large Commercial Banks

MBOs: mobile network operators

MMF: Money Market Fund

MNEs: multinational enterprises

MOF: Ministry of Finance

MSP: multi-sided platform

MTN: medium-term note

NDRC: National Development and Reform Commission

NFCS: Net Financial Credit System

NPC: New Product Committee

NPD: New product development

NPLs: non-performing loans

OECD: Organization for Economic Co-operation and Development

OTC: over-the-counter

PCA: Principal Component Analysis

P2P: peer-to-peer

PBOC: People's Bank of China

PCAC: Payment & Clearing Association of China

PPP: public-private partnership

PRC: People's Republic of China

RCCs: Rural Credit Cooperatives

REIT: real-estate investment trust

RPA: robotic process automation

SAFE: State Administration of Foreign Exchange

SASAC: State-Owned Assets Supervision and Administration Commission

SCIS: Shanghai Credit Information Services

SEPA: Single Euro Payment Area

SFTZ: Shanghai Free Trade Zone

SME: small and medium-sized enterprise

SMVCBs: small and medium sized & village commercial banks

SOCBs: state-owned commercial banks

SOE: state-owned enterprise

TLAC: total loss absorbing capacity

TQM: Total Quality Management

UCCs: Urban Credit Cooperatives

WTO: World Trade Organization

WMP: wealth management product

Chapter 1: Introduction

Financial services represent a considerable economic sector at a global scale. In Europe, for example, financial services accounted for roughly 6% of gross value added in 2019 (Eurostat, 2019). In OECD countries, financial intermediation, real estate, renting and business activities accounted for almost 30% of total value added in 2019 (OECD, online library). Financial services took up about 10% of China's GDP in 2019, a year-on-year increase of 17% (China Daily, 2019). Despite its crucial role in the economy, the financial services sector has been largely neglected in innovation studies partially since financial innovation is largely hidden, intangible and hard to visualize. Financial institutions do not really have a dedicated innovation or R&D department per se. In addition, they have long been adopting a conservative approach to innovation. The risk-adverse attitude towards financial innovation, combined with the common belief that most financial innovations are only imitations of existing products, has resulted in the lagging capacity for innovation in the financial services sector over the past decades (Mention and Marko, 2014).

Recently, innovation in financial services has attracted increasing attention and criticism following the rapid rise of FinTech or Finance Technology (FinTech) in China. FinTech, in this sense, refers to peer-to-peer (P2P) lending platform, mobile payment, crowdfunding and online wealth management product (WMP) distribution. The Chinese government and IT giants have been vigorously driving financial innovation in recent years. Specifically, the Chinese government promotes inclusive finance through private-owned banks pilot program that lowers the base-lending rates and a healthy development of FinTech through deregulation. China's Premier Li Keqiang described financial innovation as one of the driving forces for entrepreneurship and employment. And people's demand for financial services can accelerate reforms in the sector. (*China Daily*, 2014). IT giants apply new technologies such as mobile Internet, big data analytics, cloud computing and QR code payment to drive innovations in FinTech. As pointed out by Jack Ma, Chairman of Alibaba and Ant Financial Group, online banking and FinTech provide two big opportunities in the future financial industry (New York Times, 2014).

The recent closure of P2P lending firms and financial scandals, however, raised concerns over "aggressive financial innovations", financial investor and consumer protections, as well as social and financial stability. For example, in Nov 2020, the Chinese government halted the

Initial Public Offering (IPO) of Ant Financial a few days before it goes public due to worrying of it may accelerate the debts ratio in the country through its innovative financing products. However, innovation in financial services should not be feared, as it is an acknowledged driver of economy growth, international business and market competitiveness, and therefore, it should bring benefits to the society. As Mention and Marko (2014) properly noted, attention should be paid to the design, sustainability and implementation of innovation instead of resisting to innovation.

1.1 Financial Innovation Issues in China's Banking System

The Third Plenary Session (Nov. 2013) of the 18th Central Committee of the Communist Party of China (CPC) adopted the Decision on Major Issues Concerning Comprehensively Deepening Reforms (the "Decision"). It was decided to deepen China's financial system reforms, including establishment of privately-owned banks, Renminbi internationalization, interest rate and Renminbi capital account liberalization, deposit insurance scheme and financial institutions' market exit mechanism. The overall theme was "to liberalize and let the market economy drive innovation". In July 2015, the Guiding Opinions on Promoting the Healthy Development of Internet Finance (the "Opinions") was released to encourage healthy innovation in the financial service industry and lay out measures to prevent potential risks. The Opinions formalized the governance bodies, operation guidelines and disclosure requirements for different segments of Internet finance in China.

The reform in the financial system has also changed the operation landscape of financial institutions in China. After a long period of monopoly, China's state-owned banks have limited experience in dealing with the dynamics of open competition and declining profit margin. Although they have access to policy advantages in government-led financial inventions such as Shanghai Free Trade Zone, the challenge they face is the lack of talents and competence to develop innovative financial products. State-owned banks are also imposing transaction ceilings on third-party payment tools in response to competition from online Money Market Funds (MMFs) such as Yu'e Bao of Alipay. Another prominent issue in China's banking system is shadow banking. Standard & Poor's (S&P) estimated the size of shadow banking in China to be $50 trillion (equivalent to 250% of China's GDP) as of the end of 2019. The rapid expansion of shadow banking in China is possibly the result of financial innovation trying to meet the financing needs from real estate industry and provincial governments, investment needs from

investors for higher returns than bank interest rates, and lending needs from banks to avoid supervisory and regulatory controls on loan-to-deposit ratio (75%).

Innovation in the financial services industry is required to enhance competitiveness of state-owned banks and bring sunshine to shadow banking. With these objectives in mind, the People's Bank of China ("PBOC") remains committed to the perception, direction and policies of encouraging innovation in the industry by closely following principles laid out in the Decision and the Opinions. PBOC also prevents local and systemic risks by establishing a diversified and multi-layered financial system that focuses on developing statistics to determine actual conditions and promoting continued financial reform, including the liberalization of interest rates, development of financial inclusion and encouragement of financial innovation.

Research on financial innovation remains lacking as to how it happens, what its antecedents and consequences are, who the main actors are, what innovation facilitators and barriers are, and what its effects at different levels are. Recent literature and trends have stressed that the challenges for innovation in financial services are multifold and mainly stem from the undeniable role of regulation, the relative lack of formal appropriability mechanism, the dominant use of new technologies including social media, the shift in behavior and towards accrued customer centricity, the automation of processes, and the rebuilding of trust and confidence (Mention and Marko, 2012). A new set of norms, legitimacy and business models will emerge after the institutional change brought by regulation, technology and competition. Chinese banks are facing managerial and operational dialectics in institutional arrangements and are undergoing some significant and industry-wide institutional changes.

The establishment of China Banking Regulatory Commission (CBRC) in 2003 (later renamed China Banking and Insurance Regulatory Commission (CBIRC) after merging the supervisory roles of banking and insurance under one agency in 2018) marked the beginning of modernization measures for the Chinese banking system. The main responsibilities of CBRC included prudential regulation and supervision of banking risks, while the role of PBOC is to develop monetary policy. CBRC introduced a provincial administrative model, whereby general policies were enacted by central CBRC, and they were adopted, detailed and enforced by provincial CBRC offices. The creation of CBRC also represented the Chinese authorities' acknowledgment of a deficiency in its banking regulatory system, particularly a lack of market discipline and inadequate regulation of risk management (Shi, 2004).

The current legislation stipulates that PBOC supervises interbank markets as well as the payment, settlement and credit information systems. PBOC remains the ultimate guardian of

the stability of the entire Chinese banking sector. In the absence of a formal deposit insurance scheme in China, the Chinese government plays a guarantor role for public deposits in the event of a financial crisis. For example, during the global financial crisis in 2007, the Chinese government provided an implicit guarantee for retail deposits (Kang, 2010) to insure against the unraveling of the financial system and economy.

Besides CBRC and PBOC, the other four governmental departments relevant to China's banking regulatory framework are the State Administration of Foreign Exchange (SAFE), the Ministry of Finance (MOF), the National Development and Reform Commission (NDRC), and SASAC. SAFE takes regulatory responsibility for all banking businesses related to foreign currencies; MOF is the major executive agency for government financial policies; NDRC regulates the pricing of banking services and products; and State-Owned Assets Supervision and Administration Commission (SASAC) oversees state-owned enterprises (SOEs), most notably Chinese banks.

Chinese authorities can have a significant impact on innovative financial products of foreign banks operating in China. For example, from 2008 to 2009, some SOEs suffered considerable losses, reportedly more than USD 2 billion, in dealings with derivative products via foreign banks. Consequently, SASAC issued a notice prohibiting SOEs' use of speculative derivative transactions. This intervention took foreign banks by surprise and caused significant losses to their derivatives business in China (He, 2012).

This incident demonstrates that banks operating in China (foreign and domestic) run a significant risk of sudden unexpected changes in government policies (with regards to new financial products) and resultant interference in banking activities in a manner and to a degree that they may not be accustomed to in their home countries or other jurisdictions. Another example of regulatory interference in financial innovation is CBRC's regulation on banks' loan-to-deposit ratios of 75% daily from June 2011. The rationale for this ratio derived from the fact that banking business conducted by Chinese banks was mainly loan focused, thus a loan-to-deposit ratio requirement was a simple way to control loan size and ensure adequate liquidity in Chinese banks. However, this constrained the ability of banks to leverage by applying innovative financial instruments (He, 2012).

All banking products or services fall within China's banking regulatory framework. One of CBRC's specific objectives is to increase public knowledge of financial products, services and the related risks through education and information disclosure (CBRC, 2009). Approval of banking products must be sought from CBRC on a case-by-case basis. Overall, CBRC takes a

broad and rigorous approach to the regulation and innovation of banking products and services. CBRC performs its rule-making and supervisory functions on a pervasive basis, often regarded as over-supervision of its current resources and capabilities. Such "heavy touch supervision" is less evident in developed economies (He, 2012). Another example of regulation of the same nature lies in CBRC's regulation of banks' internal management that encompasses appraisal of directors' and officers' performance by setting appropriate codes of conduct and evaluative performance criteria.

Besides remaining as a prudential and business conduct regulator, CBRC also helps facilitate and guide the commercial undertakings of banks towards better internal management and risk management practices. However, some regulatory measures may put foreign banks at a disadvantage compared to Chinese banks and anti-innovation (He, 2012). In 2009, CBRC issued new requirements on customer authentication, whereby representatives of new corporate customers shall visit bank premises in person and banks are required to videotape the contracting process. This new regulatory initiative placed foreign banks at a disadvantage as they normally do not have an extensive network of local outlets for customer access. Reportedly, a foreign bank incurred a substantial loss as a customer was not willing to travel to comply with this compulsory regulatory procedure (PwC, 2010). Some innovative products in other markets are not easily transferable to the Chinese market due to regulatory constraints.

There is a major regulatory incursion into the internal business management processes of banks by CBRC through regulatory means. It reflects a historical association between the regulator and the regulated in China (He, 2012). The equity interest held by central and local governments in Chinese banks (via SASAC) and the active role played by governments in China's banking reform (Song, 2008) have also significantly influenced CBRC's regulatory approach. Chinese banks' inexperience in corporate governance, risk management and product innovation has also made it necessary for CBRC to undertake paternalistic regulation. In this regard, the goal of CBRC is to improve the "competitiveness" of Chinese banks (Garcia-Herrero *et al.*, 2007), promote the safety and soundness of banking industry, maintain public confidence, and protect the interests of depositors and consumers (under the public interest theory) (CBRC, 2010).

Foreign banks are known to have a competitive edge in product innovation with sound risk management control, and they can leverage on the existing products that have already developed in home markets (Achhorner *et al.*, 2006) to China in short time-to-market. Foreign equity participation has been viewed to assist Chinese banks in overcoming their lack of managerial experience, risk control capacity, and corporate governance (PBOC, 2002). CBRC

and Chinese banks are learning from their foreign bank partners via joint ventures and supervisory reviews. There has been an observable trend of continuing growth and expansion of products and services by Chinese banks (PwC, 2010).

The degree of regulatory openness is limited to a level that allows Chinese banks to learn from the practices of their foreign counterparts, gradually eroding foreign banks' competitive advantage (He, 2012). Wealth management is a good illustration. Since 2007, CBRC has been "controlling" the pace of approval of new WMPs in foreign banks, allowing Chinese banks to nurture (KPMG, 2007). Few years later, Chinese banks flourished in WMPs, and now foreign banks can only compete with Chinese banks by providing better services (PwC, 2010). We can reasonably conclude that CBRC has the ultimate regulatory power and vested interests to control the velocity of financial innovation to protect the safety and soundness of the banking industry as well as the security of domestic deposits (He, 2012). Mr. Wang Qishan, former Vice President of CBRC, articulated that acceptance of foreign entrants (and the innovations brought about by them) is firmly based on the premise that the safety of China's banking system remains assured. Under CBRC's paternalistic regulatory approach, the innovativeness of the banking sector depends on the readiness of Chinese banks to compete in the open and volatile monetary market.

CBRC also adopted a government policy-based regulatory approach. Commercial banks are engaged in significant SOEs and state-directed lending while CBRC still has macroeconomic policy goals as its mandate (Bell and Chao, 2010). Through its regulatory directives, CBRC directed credit to rural economy in the west and agricultural production. It is widely accepted that the increasing availability of financial services (Olson, 2003) and boosting economic development (Alllio *et al.*, 2004) are legitimate goals for banking regulation. Increasing financial services in rural areas has been a long-standing characteristic of banking regulations in emerging economies (Nair and Kloeppinger-Todd, 2007). In this regard, financial innovations that are well aligned with the government's macroeconomic policies are most likely supported and gain popularity from the regulators. However, there is a concern about the danger of making credit lending decisions without adequate commercial considerations, which may be detrimental to the stability of the banking sector in the long run. It also undermines the interests of the regulated entities, violates market principles and distorts banks' commercial motivations. Banking policies should encourage banks to operate efficiently and make sound capital-allocation decisions based primarily upon commercial considerations (Barth *et al.*, 2006).

Although a well-established regulatory framework ensures clarity in regulatory expectations and certainty in implementations is necessary for a high level of compliance, a

rules-based approach to regulation may not work well for emerging markets (Ping, 2011). In China, command-control regulation is dominant. But principles-based regulation and self-regulative approach have emerged in response to regulatory demand for innovation (CBRC, 2007a). For example, derivatives business relating to equities and commodities are approved by CBRC on a case-by-case basis (Han, 2007). The regulation of derivative business was also addressed by the Guidelines for Financial Innovation of Commercial Banks (2006) (the Guidelines) which set out general principles governing financial innovations like derivatives. Specifically, commercial banks shall know its own business, know its own risks, know its own customers, and know its own counter-parties. The regulatory intention was to meet the needs of the economy and require institutions to establish a self-administered process. Compliance with CBRC policy, or at least non-violation thereof, is the first yardstick for innovation approval process. Evidence of sound internal management and risk management procedures on the innovative products are approval accelerators (He, 2012).

In addition to rules and directives, CBRC also used Window Guidance to advise commercial banks on lending limit to certain sectors (Geiger, 2008). It consisted of verbal communications between the regulatory officer from CBRC and the compliance office at a bank. It enables regulators to act in a prompt manner to changing circumstances and allows for a tailored approach to regulating banks of different sizes and levels of complexity (He, 2012). Using this soft tool, CBRC can "differentiate" the regulated entities and "promote" certain innovations in a "small scale" manner. The verbal measures provide the regulators with constant interactions with banks, room for regulatory discretion, and a channel to execute political concerns to "*effectuate policy considerations*" (He, 2012).

As illustrated above, despite dominance of traditional command-and-control regulation through rules-based regulation, principles-based regulation has been gradually incorporated into the regulatory process to promote innovation and productivity among banks (CBRC, 2007a). Through delegating some interpretative power to the regulated entities and external third parties, it is evident that principles-based regulation has emerged as a supplement to command-and-control regulation (He, 2012). However, this does not mean the regulated has a "free-hand" under the principles-based self-regulative regime. For example, after the subprime mortgage crisis in the US and Europe, CBRC has tightened the scrutiny of derivative products in China. Foreign banks are prohibited from marketing their offshore derivative products to onshore clients. Therefore, the financial innovation process in China is dependent on both the internal policy and the external market.

The above analyses highlight the uniqueness and complexity of financial regulation and

operating environment in China.

1.2 Research Objective, Questions, Significance and Epistemological Approach

The objective of this study is to understand how financial innovation happens in China, especially in large commercial banks (LCBs) and FinTech firms, using a pragmatic approach. The following three core research themes and questions are put forward accordingly.

1. **Innovation process**: What are the representative financial innovation processes or models in China? How are they different between LCBs and FinTech firms?
2. **Regulatory dialectics**: How do commercial banks and FinTech firms manage and adapt to regulatory changes in China? What are measures they take to resolve the dialectics?
3. **Institutional change**: How was China's banking system transformed over the past 20 years? What are the roles and actions of institutional actors and agents in this process?

To address these questions, this study intends to explore the implications of different models of financial innovation, together with the theoretical assumptions and practical considerations that underpin them, for the varying purposes of regulatory dialectics reconciliation that may result in different institutional change processes. In doing so, this study will contribute to the emerging and growing literature that has critically examined the concept of financial innovation and extend the discussions around the methods and approaches taken by traditional and branchless commercial banks in China. The study argues for not only greater awareness and conceptualization of financial innovation in China, but also a more thorough consideration on the part of regulatory, institutional, and technological implications that relate to state policy, organizational trajectory, and product distribution. It helps to identify different journeys of financial and institutional innovations in China's commercial banking which can be generalized to other types of financial service and different financial regulatory frameworks. It also provides ideas to regulators in developing a balanced approach to innovation and protection.

This study adopts a new approach to analyze China's banking system reform over the past 20 years from the institutional change perspective, which advocates a new lens of viewing institutional change, in the forms of institutional design, adaptation, diffusion and collective

action, as part of the continuous progression towards a state of equilibrium instead of discrete explanation of individual change phenomena. Finally, this study uses an interpretivist approach (sometimes referred to as constructivist). The case study method emphasizes the ability of the researcher to construct meaning by reading and observing the phenomena in real-life scenarios.

1.3 Structure of This Thesis

The thesis is structured in the following way: Chapter 1 describes the background of this study and the current issues in China's banking reform. The research objective and questions are put forward with a view to filling the gaps in the existing literature on institutional change and innovation theories – using a process research approach based on six case studies in China. Chapter 2 discusses the theoretical foundation for this research, including the literature on financial innovation and institutional change theories. Literature and research gaps are identified and further addressed. Different schools of thoughts are also discussed, and the theoretical choice of the author explained. Chapter 3 addresses the methodological considerations, with an emphasis on the research design, data sources and data analysis. A pilot study was conducted to refine the research questions and scope. The research adopts multiple case-studies. The approaches for selecting the case firms are also explained. Chapter 4 explains China's banking reform over the past 20 years, providing a context especially for those not familiar with the banking system, reform and regulatory influences in China. Chapters 5 to10 present the empirical findings of the six case banks. Each case study is structured and presented in a consistent way. It starts with an introduction of the case bank, followed by the operating environment, strategy and performance of the bank. Then the empirical data and explanations obtained from interviews and documentary reviews in relation to the research questions are presented. Each chapter ends with a summary of the innovation model observed in the case bank. Chapter 11 presents findings based on cross-case comparisons results – answering the research questions more holistically with an aim to derive generalizability. Finally, Chapter 12 contains a concluding discussion of the main findings. Limitations and suggestions for further research are given to inspire new interest in this field.

Chapter 2: Literature Review

Innovation, the process of introducing new products, new services and/or new practices to institutions, is an important topic in business research today. While innovation helps create new demands, improve quality and lower price, it does not have a universal and authoritative definition. Innovation is a broad subject, one that involves a variety of business disciplines including strategic management, business model design, product and service development, process engineering, change management, organizational behavior, marketing and economics. Research on innovation has proceeded in many academic fields, using a process and/or a variance approach and focusing on distinct aspects of innovation from creation, design, development, adoption, diffusion, legitimation to business evolution evidenced in institutions and institutional fields.

Based on the literatures review with an annotated bibliography covering the period from 1960 to 2020, it is argued that there remain several gaps and deficiencies in the institutional change literature, especially in relation to the institutional, product and process innovations in the financial service sector. To address this deficiency, this study contributes a research agenda, which will help heighten appreciation of key issues, such as regulatory compliance, actor network, political influence, in the continued development of change and innovation theories in the financial services firms and industry.

This chapter provides a further discussion on the definitions, characteristics and meanings of financial innovation – the what, how and why. Then, an in-depth review of the literature on institutional change is presented focusing on theories, empirical studies and practical issues relating to institutional design, adaptation, diffusion and collective actions. Then, the issues and dilemma of regulatory dialectics are addressed before an integrated view of financial innovation and regulatory compliance is presented.

2.1 Financial Innovation

In general, innovation can be defined based on different schools of thought. Table 2-1 lists the four main definitions:

Table 2-1: Four main definitions of innovation

School of Thought	Author/Organization	Year	Definition

The **Classic definition**	Schumpeter	1934	"*a **historic and irreversible change** in the method of production of things" and "**creative destruction***"
The **OECD definition**	OECD	2005	"*the implementation of a new or significantly **improved product (good or service), or process, a new marketing method, or a new organizational method** in business practices, workplace organization or external relations*"
The **Theory of Change definition**	Roberts & Amit	2003	"*a combination of invention and exploitation: the invention process covers all efforts aimed at **creating new ideas and getting them to work**; the exploitation process includes all stages of commercial development, application and transfer*"
The **Knowledge Creation definition**	Acs, Anselin & Varga	2002	"*a tool for the **creation of new knowledge.** The use of new products, services, processes and paradigms that are embedded into existing innovation leads to new ways of thinking and new knowledge*"

So, what is financial innovation then?

2.1.1 Definition

There is no consensus on the definition of financial innovation in literature. According to Mention and Torkkeli (2012), financial innovation should encompass both the process and the outcome, can be developed internally or jointly with partners, and should bring overall benefits to the industry, society and regulation maturity. More specifically, they define financial innovation as "***changes in the offerings of banks and other financial institutions**, **as well as modifications to internal structures and processes, managerial practices, and new ways of interacting with customers and distribution channels***" that bring overall enhancement to the industry maturity, benefits to the society and financial stability in the county.

In 2006, CBRC issued the Guidelines, defining the term "financial innovations" as *"the various innovative activities in respect of strategic decision making, system arranging, institutional setting, personnel preparing, mode of management, business flow and financial products and so on, which are carried out by commercial banks through bringing in new technologies, applying new methods, expanding new markets and establishing new*

organizations in order to adapt to the development of economics, and which are finally embodied into continuous improvement of the risk management capacities of banks, and the creations and updating of service products and service methods offered to customers." The Guidelines also placed further emphasis on the importance of consumer protection and risk management by acknowledging the principle of putting the interests of the consumers at the core and recognizing the numerous roles financial innovation plays in the sustainable development of commercial banks.

This study adopts Mention and Torkkeli's (2012) definition which is largely aligned with CBRC's financial reform goals and motives. Therefore, this study will focus on three key aspects of financial innovation, namely institutional change, innovation process and innovation management adopted by traditional banks and FinTech firms operating in China. Wang Zhaoxing, Vice Chairman of CBRC, emphasized the need to vigorously promote financial innovation to enhance the competitiveness and avoid financial risks (*Xinhua News*, 24 March 2017). According to Mr. Wang, CBRC would intensify monitoring and ensure that risks from financial innovation are kept under control. Financial innovation in China would stick to the bottom line of no systemic financial crisis. In a broader sense, financial innovation of commercial banks in China refers to "*various new activities developed by commercial banks in aspects of strategic decision, institutional arrangement, institution setting, personnel preparation, management model, business process and financial products by means of new technology introduction, new method adoption, new market exploration and new organization construction to adapt economic development requirements*" (CBRC, 2007). For example, China's regulators set a red/bottom line for financial institutions, crossing which will result in heavy penalty, suspension of activities or revocation of banking license. To limit the credit risk exposure to third party platforms, PBOC caps the maximum amount an individual can transfer into their mobile payment account daily. While regulators adopt a tolerant approach to financial innovation, they also impose regulatory barriers to non-compliance and conduct more rigorous audits on new forms of financial activities and new product development (NPD).

How does western literature define and interpret financial innovation? Lerner and Tufano (2011), for example, define financial innovation as "*the act of creating and then popularizing new financial instruments, as well as new financial technologies, institutions, and markets.*" This definition emphasizes on products or outcomes of financial innovation, which in the last decade were typically financial instruments and ICT-based financial products, including exchange-traded funds (ETFs), hybrid complex medium-term notes (MTNs), sovereign credit default swaps (CDS) and liquidity swaps, Islamic banking and on new trading practices such

as high-frequency trading (HFT) (Muniesa and Lenglet, 2013), ICT-based financial products such as crowdfunding, Internet banking, mobile banking, P2P lending, public-private partnerships (PPPs), third-party payment, online financing, insurance and WMPs.

Financial innovations demonstrate two related dynamic features, namely, the innovation spiral and a change in how products are used over time (Lerner and Tufano, 2011). Merton (1992) coined the term "*innovation spiral*" to describe the process whereby one financial innovation begets the next. Sometimes this spiral has one successful innovation providing the raw materials, or building blocks, for another. For example, the innovation of a futures market in a commodity can allow financial engineers to build specialized and more complex over-the-counter (OTC) products using dynamic trading strategies. The financial innovation adoption process is typically characterized by an S-curve (or logistic function) that plots the number of adopters as a function of time. Innovation partners (issuers and investors) are often informally part of the product development process, consulted by the bankers who are trying to bring the product to market. The inventors are more informed about the strengths and weaknesses of a product than a late majority adopter, who might take a product's widespread usage to signal its lack of flaws (Lerner and Tufano, 2011). This definition focuses on the "continuity" nature of financial innovation.

However, financial innovation has been slow, limited and prudent. Goetzmann and Rouwenhorst (2005) documented only 19 major financial innovations that span the past 400 years, ranging from the innovation of interest to creation of Eurobonds. Frame and White (2004) found that most literature on financial innovations concentrate largely on the "backend" of the innovation process, focusing on the diffusion of these innovations, the characteristics of adopters, and the consequences of innovation for firm profitability and social welfare. Anderloni and Bongini (2009) concluded that the ways in which banks organize their R&D activities and promote innovation and the organizational choices conducive to innovation are not sufficiently studied in literature. A vast majority of the studies focusing on the innovation process in financial services can be traced back to the literature on the major antecedents and consequences of financial crises, financial risk modelling, financial regulation development, financial information technology and organizational behavior. Only a handful of studies have made detailed analyses of the innovation process in financial institutions using a case study approach (Vermeulen, 2004; Costanzo and Ashton, 2006;). Adopting a systematic approach to service innovation through effective and formal new service development process, which may be equally important to that in manufacturing, may yield higher returns and is now

commonplace in financial service firms (Mention and Torkkeli, 2012). The following section will introduce some of the empirical studies in financial innovation over the past 20 years.

2.1.2 Empirical Results

Financial innovation can be a responsive or a proactive action to exogenous and endogenous change. Mishkin (2007) classified financial innovation into three types: (1) financial innovations as responses to changes in demand conditions. Examples are financial products and services meant to attenuate the interest rate risk under the interest rates volatility regime; (2) financial innovations as responses to changes in supply conditions. Examples are credit and debit cards, e-bank, commercial papers and securitization from the benefits of IT advancement; (3) financial innovations meant to avoid regulations. Examples are cooperation between banks and trust companies to issue loan through trust products.

There are different views on the financial innovation outcomes – it could be a change agent or a toxicant to the society. Financial innovation can bring real values or only benefit a specific group of people. Mason (2008) classifies financial innovations into "real" and "nominal". Real financial innovation provides important economic benefits to the community and creates values (and protection) to financial customers, while nominal financial innovation is a vehicle that mainly raises the compensation in Wall Street, with few real benefits. Thus, Pol (2009), defines a "toxic" financial innovation as being "a nominal innovation which single or jointly with other financial innovations provokes a financial crisis." Krugman (2007) echoed regarding securities regulation: "The innovations of recent years—the alphabet soup of C.D.O.'s and S.I.V.'s, R.M.B.S. and A.B.C.P.—were sold on false pretenses. They were promoted as ways to spread risk, making investment safer. What they did instead—aside from making their creators a lot of money, which they didn't have to repay when it all went bust—was to spread confusion, luring investors into taking on more risk than they realized."

Financial innovation can induce specific product risks or systematic risks depending on its contagion effects. Schwarcz (2008), after compiling the various definitions that had been used in policy circles, suggested the following definition: the risk that (i) an economic shock such as market or institutional failure triggers (through a panic or otherwise) either (X) the failure of a chain of markets or institutions or (Y) a chain of significant losses to financial institutions, (ii) resulting in increases in the cost of capital or decreases in its availability, often evidenced by substantial financial-market price volatility.

In terms of the objectives and intentions of financial innovation, drawing from qualitative data gathered through 51 semi-structured face-to-face interviews with senior managers responsible for different functional areas of ten UK-based financial institutions, Costanzo and Ashton (2006) found that bank managers are emphasizing **on "*speed to market*" and ability to "*adapt quickly*" to changing market conditions. The concept of innovation is more process-oriented rather than product-based.** Bankers are extending their "*reach*" or increasing their "*distribution*" of financial services or products to consumers rather than NPD per se. Innovation in banking is interpreted as modifications to an existing line of product (*exploratory innovation*). Previous studies (Avlonitis *et al.*, 2001) suggested that **the intangible character of many financial services or products and the lack of a proper patentability system for innovative products are the main causes of fast and easy imitation of new products from competitors**. In Costanzo and Ashton's (2006) interviews, bank managers acknowledged that fulfilling shareholders' short-term expectations and convincing market analysts of the long-term profitability of truly innovative products were the main barriers to developing radical and highly differentiated products in financial services. Besides, some interviewees tended to "blame" the conservative and risk-averse attitudes of customers towards innovative products for being an obstacle to the development of new sophisticated products. However, the study was conducted before the subprime mortgage crisis and did not include the views of regulators, investors and financial consumers**. The objectives of financial innovation have been dramatically changed after the crisis with the imposition of Dodd-Frank Wall Street Reform and Consumer Protection Act (DFA).**

In China, the traditional banking business model that heavily relies on branches and distribution hubs (bricks model) are challenged by Internet platforms that reach customers through technology and smart phones (clicks model). E-commerce and e-financing have a wider customer coverage, lower transaction costs and greater friendliness. These technology firms have access to high market valuation and capitalization facilities via private equity and public listing which allow them to buy into retailers and logistics companies to compete with traditional banks on costs, market reach and scale on payment processing and consumer financing. FinTech in China is changing consumer and investor behavior, as well as production, distribution and marketing business models in China. **The challenge for policy makers lies in harnessing disruptive technology as a catalyst for growth and imposing stricter regulations to curb usury, exploitation and fraud in these ICT-driven innovations. These new forms of financial innovation cut across the jurisdictional lines of traditional regulators. Consequently, the lack of disclosure, capital and provisioning standards as**

well as the absence of a level playing field make regulation and enforcement problematic (Li and Yi, 2016).

Regarding the issue in the adoption and mutation of financial inventions, Gennaioli, Shleifer and Vishny (2010) argue that a financial innovation can address the market demand for a particular set of cash flows and thus be socially beneficial, but the **risks associated with these new products may be systematically underestimated by the investors (and perhaps also the issuers, bankers and regulators) until critical mass adoption and risks alert.** In this case, there may be excessive issuance of novel securities by financial institutions. Once the investors suddenly realize these risks, they will initiate an exodus back to traditional and safer products. In this way, financial innovation can add to the fragility of the overall financial system. The US subprime mortgage crisis is a typical example showing how financial innovation could significantly affect the financial stability of a nation.

The foundations for the financial innovations are permanent transformation in the institutional, market and monetary environment. Financial innovation is therefore a permanent process (Casu, Girardone and Molyneux, 2006; Frame and White, 2002). **Financial innovation can be radical and incremental**. For example, as underlined in KPMG (2007), the retail banking innovation focuses mainly on new ways or modalities of doing business rather than on radical new products. Generally, the new retail products are incremental developments of the basic existent products such as loans or savings. In comparison, other financial sectors, such as investment banking, are characterized by "*constant and creative product innovation*".

Despite the lack of incentives towards full experimentation with truly innovative products in real markets, slightly differentiated products that are appealing to the consumer needs and user experiences can be attractive to customers although they offer little differentiation from competitors (Alam, 2003). From a strategic point of view, innovative products and services will provide positive impacts on firm reputation, customer loyalty and market leadership. Therefore, it is advocated that **financial services companies should have a balanced portfolio of innovations** (Avlonitis *et al.*, 2001), and the appropriate mix (incremental and radical innovations) will depend on companies' resources, innovation systems, talents and creative minds, top-management's priorities and market opportunities. There are firms now offering financial innovation laboratory service which provides modeling simulation on financial impacts from new product before launching (regulatory sandbox testing service). It helps to quantify the new product deployment feasibility and sustainability in different scenarios and markets.

Using a longitudinal multiple cases study method, **Vermeulen (2004) studied the product innovation team and process of ten largest Dutch financial companies and** found that (1) Multidisciplinary project teams were setup to develop new financial products. Project members were generally part-time and from different functional departments. Project leaders were from either marketing center or project manager center. Team members expected project leaders to know everything about the product that was being developed. (2) Financial product innovation process encompasses the following phases: idea generation, concept development, building, and implementation (Vermeulen, 2004). Many firms did not have a systematic mechanism to collect new ideas. The product features specification is very important to form the basis for further development. Implementation involves introducing new products to the distribution channels and the instruction of personnel and intermediaries. (3) Communication among project members in general was at a low level in most projects. The innovation process rarely involved customers, front office personnel and intermediaries in the product concept development. (4) Four barriers to innovation in the financial service firms are (a) functionally departmentalized structures that lead to conflicting priorities and battles for resources; (b) limited use of NPD tools to foster inter-functional collaboration; (c) conservative organizational culture with most managers being risk-averse; and (d) constraining legacy IT architecture resulting in product concepts that seem promising but cannot be developed without major changes in the IT systems.

Consistent with Vermeulen's (2004) findings, the lack of innovation success in financial organizations were due to (i) Functional managers tried to avoid losing control and wanted to remain influential over the project. Project members, even managers, were sometimes threatened by politics and power within organization. In the literature, project leader and core team working on a full-time basis have a higher rate of success in accomplishing the objectives (Wheelwright and Clark, 1992). **(ii) It is extremely hard for individuals to go beyond the boundaries of organizational trajectory.** The promotion and incentive systems form an important part of organizational behavior and culture. It takes a lot of courage to destroy and recreate the trajectory. To become more innovative, financial firms need to designate explicitly a 'place' for innovation and change. The size does not matter. Many large US companies such as 3M, General Electric, Johnson & Johnson and Wal-Mart have shown that "*a large size needs not be antithetical*" to innovation (Block and MacMillan, 1993).

To understand the roles and challenges of the New Product Committee (NPC) in financial innovation, Armstrong *et al.* (2012) conducted two case studies to review the operations of NPC in two financial institutions in France. One is the opening of an access to a new market within a brokerage house. The other one is about the construction of a complex derivative in an

investment bank. They made the following observations: (i) NPCs in the financial industry are generally open to a multiplicity of parties but limited to the internal perimeter of the credit institution or the investment firm; (ii) The current practice of NPCs is in principle open to the expression of multiple viewpoints. The organizationally embedded character of NPCs is very dependent on the local culture of the financial firm; (iii) A robust risk department, fully independent from business lines and directly reporting to the top management, can play a pivotal role (iv) The decision to go ahead with a financial innovation usually results in the production of documents signed by involved parties (in the NPCs), which therefore certify that signatory parties are made accountable; (v) In both cases, follow-ups, reviews and audits are included within the organizational architecture leading to the expression of concerns and the traceability of decisions, thereby contributing to the development of internal organizational learning; (vi) NPCs are not always popular among bank employees. The fact that NPCs somehow produce legitimacy and allow new products to join the chain of existing products may not be sufficient to make it attractive; and finally (vii) Within NPCs, compliance officers could indeed trigger a new kind of relationship towards innovation, where discussions with regulators, whenever needed, can take place to get approval or pre-investigate official positions on some aspects and specifications of the product under consideration.

What stimulate financial innovation? Tufano (2003) listed six stimuli of financial innovation. Specifically, innovation exists to complete inherently incomplete markets; innovation persists to address inherent agency concerns and information asymmetries; innovation enables parties to minimize transaction, search or marketing costs; innovation is induced by regulation and taxes; innovation is fostered by increasing globalization, volatility and risk; innovation is stimulated by new technologies, including 'intellectual technologies'. The relations of transaction costs, regulation and technology are relevant to financial innovation in China. However, due to the acceleration of information distribution over mobile Internet, it seems the stimuli of incomplete markets and information asymmetries may need a re-examination in the context of mobile and branchless banking.

Mention and Torkkeli (2012) synthesized six key determinants of financial innovation including size, ownership, market and geographic diversification, competition, organizational structures and past performance. First, the impact of size, usually measured in terms of assets, on the propensity to innovate remains widely debated in the literature, with conflicting results. Damanpour and Gopalakrishnan, (2001) and Vives (2001) argued that larger institutions benefit from economies of both scale and scope and can access larger pools of resources, including funding sources, and to manage their risks more effectively by spreading

them over a wider range of lending activities. However, larger firms suffer from inertia and hindrance by bureaucratization, and may thus be slower to adapt and less agile (Damanpour, 1992). Second, Akhavein *et al.* (2005) confirmed the importance of both organizational structures and geographic location on the probability and rate of innovation adoption as more centralized organizations (namely, banks having fewer separately chartered banks and more branches) show a higher probability to introduce financial innovation. Third, diversification has mainly been identified as negatively related to the likelihood of innovation. Vives (2001) also discussed the emergence of diseconomies of management and agency problems in diversified banks. Forth, literature suggests that banks are more likely to innovate as a response to competition and to address institutional challenges rather than to launch novelties which represent *ceteris paribus* business opportunities (Batiz-Lazo and Woldesenbet, 2006; Costanzo and Ashton, 2006). Fifth, Yildirim and Philippatos (2007) evidenced that foreign ownership and the ratio of foreign institutions to the total banking population are negatively associated with performance measures (ROA and net interest margin), thus improving the efficiency of the overall banking system. Batiz-Lazo and Woldesenbet (2006) argued that larger banks are more inclined towards process innovation than product innovation, as they aim to increase efficiency of operations instead of venturing into new products and markets. Sixth, Ciciretti *et al.* (2009) contended that banks' positive past performance increases the likelihood to introduce technologically-induced innovation. Institutions holding large market shares and operating in concentrated markets are also more likely to be early adopters of process innovations (Bofondi and Lotti, 2006).

Alt and Puschmann (2012) identified four drivers of banking innovation, namely, the consequences of financial crises, the changing behavior of banking customers, the pace of diffusing innovative downstream IT-solutions, and the emergence of non-banks. In recent years, non-bank players are emerging with new IT-based business models, and they provide more innovative and customer-oriented IT solutions to meet the market needs. IT solutions offered by these new actors include third-party payment solutions and social web applications, such as mobile wallets, online investment communities and P2P business models. Examples of these services include Covestor or Prosper in the US, Alibaba's Yu'e Bao in China and "Facebook Credits" in selected countries. Alt and Puschmann (2012) observed three aspects of the banking IT innovations in the new social media paradigm. First, most banking IT innovations focus on a specific customer need within a customer process. Second, many banking IT innovations are based on mobile and, in particular, social web technologies (C2C processes). Third, low interoperability and standardization in the existing banking IT innovations are provided on

those platforms. These determinants (Tufano, 2003; Mention and Torkkeli, 2012; Alt and Puschmann, 2012) are important in this study especially given the need to analyze and explain why one bank is more or less innovative than another bank.

With the development in FinTech and the US sub-prime mortgage crisis, **financial innovation has attracted increasing attention and different opinions**. Critics of financial innovation argue that most innovations in the financial system are not aimed at the enhancement of the ability of the financial sector to perform its social function, but rather embraced opaque pricing including billing tricks and traps that encourages unsafe lending practices (Lerner and Tufano, 2011). Supporters of financial innovation claim that innovation has triggered a reshaping of the industry, with increasing linkages among market players, either through cooperation or to a large extent, co-opetition, leading to the emergence of a new ecosystem (Mention and Torkkeli, 2012). Besides institutional industry change, financial innovation also brought other benefits to the society, such as financial inclusion for rural poor, new financing for small and medium-sized enterprises (SMEs) and households, economic growth and employment for FinTech, new product offering and better service from banks.

According to Mention and Marko (2012), **innovation in financial services has wide consequences,** which may affect the operations and performance of financial firms themselves and may also impact society through the rapid diffusion and wide adoption mechanisms of their novelties. The intended and unintended effects of financial innovation on society have attracted much interest recently. Sveiby (2012) discussed the pro-innovation bias and stated that innovation may have unintended and negative consequences affecting society. A similar phenomenon is happening in China's FinTech innovation boom with the strong promotion of entrepreneurial innovation under the "Vanguard Initiative" by the government. Den Haan and Sterk (2010, p.707) contended that financial innovation plays a role in moderating business cycles, by reducing frictions in lending and thus allowing financial intermediaries to "*continue to fulfill their role efficiently during an economic downturn*". Lerner and Tufano (2011) underlined the interconnectedness of the financial system, with the inevitable consequence that financial innovation will "*generate a complex web of externalities, both positive and negative*".

Goddard *et al.* (2007) stated that major changes to internal systems in the banking industry, such as "customer relationship management systems, business management technologies, core processing technologies and various support and integration technologies" have positively impacted performance and profitability. In a survey of 58 financial innovations spanning from 1974 to 1986, Tufano (1989) found evidence **that innovators from the investment banking industry capture higher market shares than followers with their introduction of new**

products, despite the rapid release of imitative products. His study further uncovered that the development costs for imitators can be halved compared to first movers. In their analysis of the effect of new products and processes on financial performance, measured by ROA, in the Australian retail banking industry, Roberts and Amit (2003) concluded that **banks which actively and consistently pursued innovation activities over time and whose portfolio of innovation activities was slightly differentiated from the industry enjoyed superior financial performance.** Interestingly, their study uncovered no evidence of first mover advantage and confirmed that products only new to the firm may lead to competitive positions. This echoed the findings of Lopez and Roberts (2002) who evidenced that a pioneer's competitive advantage, measured by the evolution of its market share, may erode quickly if subsequent entrants invade the market rapidly after the introduction of the innovation. Conversely, Abir and Chokri (2010) concluded that being a **first mover product innovator bestows banks with improved profitability while first mover process innovators enjoy superior profitability and efficiency** in the emerging Tunisian banking industry.

Rossignoli and Arnaboldi (2009) found that the **most innovative UK banks experienced a more significant decline of their cost-income ratio but failed to identify a significant correlation between innovation and profitability.** Relying on 38 performance measures from income statements and balance sheets, DeYoung *et al.* (2007) contrasted early adopters of transactional websites with their 'brick-and-mortar' counterparts. Their study evidenced that this additional delivery channel led to non-trivial increases in bank profitability, primarily resulting from the willingness of customers to pay for extra fee-based services. They also concluded that transactional websites complemented rather than substituted other delivery channels. Likewise, Hernando and Nieto (2007) contended that internet banking is a complementary strategy to reach customers. Their study of Spanish commercial banks uncovered that the adoption of internet banking practices as an additional delivery channel had significant positive effects on banks' profitability, measured in terms of return on assets (ROA) and return on equity (ROE), after 18 months and three years respectively. By analyzing the Italian banking industry, Ciciretti *et al.* (2009) found evidence of a strong association between the adoption of transactional websites to offer new services and profitability measures. Yet, they unveiled a marginally significant correlation between risk measures and internet banking activities, which may be attributable to the diversification of assets and broader geographical reach. Their findings suggested that further research on the effects of such practices on risk is needed.

In their qualitative exploration of the commercial banking industry in the UK, Batiz-Lazo and Woldesenbet (2006) concluded that **being a first mover to the market was not perceived as a key innovation driver** by senior managers and management consultants, who reported contrasted views on whether being a first mover entails a competitive advantage. Their study further delineated the effects of product and process innovations on performance, contending that they both contribute in their own ways to performance, either in increased revenues or improved efficiency and cost reduction. By studying the impact of new service on performance, Avlonitis *et al.* (2001) concluded that the degree of novelty has a strong influence on the financial performance, measured in terms of profitability and market share development. Their study unveiled an inverted U-shaped relationship between financial performance and the degree of innovativeness of new services, thus concluding that **new delivery processes and service modifications are contributing most to profitability and market share growth.**

Relying on a mix of factual and perceptual measures of performance, Damanpour and Gopalakrishnan (2001) investigated whether product innovation precedes process innovation in high-performing commercial banks. Their findings partially supported this sequence, but a further analysis suggests that **high-performing banks tend to introduce synchronous processes and product innovations.** Joint strategies of product and process innovations allow simultaneous benefits from efficiency improvement and a wider range of offerings to address market and customer needs.

Vermeulen (2004) revealed that innovation is usually conducted by multidisciplinary teams, consisting of members that remain, first and foremost, representatives of their functional departments and who dedicate only part of their time to the NPD project. These teams are set up on an ad hoc basis after positively going through the screening stage, and rarely involve front office personnel and intermediaries. According to Vermeulen (2004), **customers are rarely involved in the innovation process and products often end up on the market without prior analysis of customers' interests for these novelties**. This finding echoed the conclusion drawn by de Brentani and Cooper (1992), according to whom "*most new service products are not market tested"*. It also resonated with the conclusions of Costanzo and Ashton (2006) who argued that the innovation process is more market-oriented than customer-oriented, thus targeting the quick introduction of slightly modified offerings as a response to competition rather than truly identifying and meeting customers' needs. The lack of systematic efforts to collect ideas and source information from the front office personnel is also evidenced by Vermeulen and Dankbaar (2002).

Recent studies have explored the applicability of total quality management (TQM) methods such as Lean, Six Sigma, Lean Six Sigma, and the theory of constraints in financial services (Azis and Osada, 2011; Kumar *et al.*, 2008; Lin, 2008). Others have investigated business process reengineering methods and their effects on the introduction of novelties and on performance improvement (Akamavi *et al.*, 2001; Maull and Childe, 1994; Shin and Jemella, 2002), or focused on improvement to financial services and operational efficiency using process mapping techniques and flowchart (Akamavi, 2005). Studies have concluded that these approaches support process innovation and facilitate incremental innovation (De Koning *et al.*, 2008), make it possible to quickly identify the weaknesses in service and transactional processes, and focus on areas where improvement yields higher returns in terms of true savings and revenue growth (Uprety, 2009). **Despite the rich content of literature on financial innovation process, the existing literature has not really studied the day-to-day innovation process, the innovation interactions between provincial and HQ banks, and the interplay between front office and product development team.**

What facilitate innovation in financial institutions? De Brentani and Cooper (1992) revealed **five main determinants of service innovation success**, namely, meeting customer's needs, quality of marketing activities, existence of synergies between the existing offerings and the novelty, skills of the personnel in charge of provisioning the service, and finally the positioning of the new service, its differentiating factors and uniqueness features. Storey and Easingwood (1996) extended this list by adding two success factors, namely, distribution strength and effective communication. In the same vein, Johne and Davies (2000) stressed that achieving realistic appraisal of market opportunities, realizing the potentials of distinct market segments and designing new ways of approaching the markets are essential success factors. Athanassopoulou and Johne (2004) emphasized the benefits of involving continuously carefully selected customers in the new service development process. Menor and Roth (2008) further concluded that **market acuity, defined as the ability to simultaneously comprehend the competitive landscape and to anticipate and meet customers' evolving needs, is the most important new service development competence**, which in turn affects new service development performance. Listening to customers' feedback and complaints can positively affect innovativeness, conditional upon the quality of the information and relationship (Yang *et al.*, 2009). Carvalho Viera *et al.* (2004) highlight the influence of strategic factors such as global quality, marketing effort, degree of innovativeness to the market and existence of a lot of new service development (NSD) process on the overall success of new financial services innovation

but fail to uncover the effects of environmental factors such as market competitiveness and regulation.

Papastathopoulou *et al.* (2006) emphasize the importance of **involving frontline personnel as well as operations staff throughout the process due to their essential role in service quality and their knowledge of customers**. Johne and Davies (2000) stressed that achieving **realistic appraisal** of market opportunities, realizing the potentials of distinct market segments and designing new ways of approaching the markets are essential success factors. In contrast, **operations and IT functions hold a dominant role** in the development of imitative products, where emphasis should be on improving the delivery process and addressing the failures of competitive offerings (Papastathopoulou *et al.*, 2006). Lievens and Moenaert (2000) examined the **impact of communication on the innovation process and its success**, integrating the peculiarities of services as mediating variables. Their investigation uncovered the crucial effect of intra-project communication on resource, technological and customer uncertainty reduction as well as the essential role of the so-called information gatekeepers (front office personnel) and organizational liaisons as predictors of the uncertainty reduction about customers and competitors, respectively. The innovation facilitator constructs of customer contributions, marketing and communication effectiveness, and IT capability are interesting and shall be studied on the context of China's banking system. Nevertheless, it seems the total customer involvement is difficult to achieve in financial innovation. Also, **the construct of government policy support has not been discussed so far in literature.**

What constrain innovation in financial institutions? Drew (1995) identified **organizational barriers and enablers to fast new product and service innovation**. Barriers to fast innovation process include the lack of a focused strategy, insufficient support from senior management, organizational inflexibility and employee turnover. External factors, such as poor economic conditions, also affect the rapidity of the new product and service development process. His study highlighted the importance of market orientation, relying both on customer and employee insights, the adoption of a proactive attitude to product development, the essential role of designing strategic plans and setting goals for innovations, the positive effect of having separate unit for R&D and innovation, and the crucial role of skills and diversity rewarding schemes as enablers of a speedy innovation process.

Vermeulen (2004) further identified **four major barriers to product innovation** in the financial industry, namely, functionally departmentalized structures, which inevitably lead to resource conflicts and prioritization of daily activities, with subsequent product development delays; limited use of NPD tools, including project management as organizational mode and

lack of communication among team members; conservative organizational culture and risk aversion and constraints from legacy IT systems, preventing adaptability and interoperability. According to Vermeulen and Dankbaar (2002), if innovation usually originates from multidisciplinary work groups, most of the work is conducted in mono-disciplinary teams, leading to vertical communication flows rather than horizontal ones. The innovation barrier constructs of management supports, organizational trajectory, functional duality and communication barriers are interesting and shall be further studied. **It also seems that the government's influence as a potential innovation restriction has not been discussed so far in literature**.

Based on the above analysis, financial innovation is highly intangible, multifaceted, multifold and has wide impacts on the society and the financial stability of a country. The outcome of the innovation process usually relies on a bundle of new products and services, which are offered through innovative channel to customers. Recent literature and trends have stressed the challenges for financial innovation which mainly stem from the undeniable role of regulation, the relative lack of formal appropriability mechanisms, the dominant use of innovative technologies, the shift in behavior and towards accrued customer centricity, the process automation and the rebuilding of trust and confidence among financial consumers (Mention and Torkkeli, 2012). **But literature on China's banking system regarding the innovation process, model and the institutional change impacts is extremely lacking.**

Based on the above literature on innovation consequences, it seems that financial innovation generally helps improve a bank's performance and financial inclusion to the society. Nevertheless, there are many comments on the potential negative effects of financial innovation, including risk to financial consumer/investor protection and financial stability of the system. However, **it seems that the mechanism of how banks evaluate the performance metrics of new product innovation has not been discussed in detail, presenting a gap in literature.**

How is innovation conducted and managed in financial institutions? According to Mention and Marko (2012), a vast majority of the studies focusing on the innovation process in financial services can be traced back to the literature on new product and service development stream and organizational behavior. **Adopting a systematic approach to service innovation through an effective and formal new service development process, which may be equally important** to that in manufacturing, may yield higher returns and is now commonplace in financial service firms. **There seems to be a gap in research on financial innovation using a case study approach to China's banking reform.**

Summary

To conclude, financial innovation can be broadly grouped into three categories: institutional, process and product innovations. Institutional innovation refers to developing a new form or arrangement of organization or management. Process innovation can be divided into innovation in the production process (back office) and innovation in the delivery channel (front office). Product innovation encompasses the process of translating ideas into actual products, from idea generation to concept development, building and application of the innovative products. Six key determinants of financial innovation are organizational size, ownership, market and geographic diversification, competition, structures and past performance. **This study focuses on the institutional change, which is brought by and/or triggers financial innovation, the processes and models of financial innovation, and the factors affecting them.**

The next section will further review the main theory of this study, namely, institutional change theory.

2.2 Institutional Change Theory

According to the new institutional economists, institutions are the humanly devised schemas, norms and regulators that enable and constrain the behavior of social actors and make social life predictable and meaningful. In an institutional arrangement, an organization can act as though it is a person with specific rights and duties. An institutional arrangement can be applied to a single actor (such as a firm's innovation process), an industry (such as technology standards), a society (such as mobile payment ecosystem), or people in multiple countries (such as international settlements). This study will focus on the process of institutional innovation or change, rather than institutional theory per se.

Van de Ven and Hargrave (2004) defined institutional innovation or change as the difference in form, quality, or state over time in an institutional arrangement. Institutional change can be determined by comparing two or more points in time on a set of dimensions (such as frames, norms, or rules) and then measure the differences over time in these dimensions. Institutional change happens when there is a noticeable difference in one or more of the dimensions over time. If the change is a novel or unprecedented departure from the past,

then it represents an institutional innovation. The term "institutional change" will be used in the following paragraphs to represent both incremental and radical change. To study institutional change, this study adopts a process theory that explains the temporal order and sequence of the events based on a story or historical narrative which provides casual and effective explanations.

Hargrave and Van de Ven (2006) classified institutional change into four distinct perspectives of institutional design, adaptation, diffusion, and collective action. Each model provides a complete and coherent explanation of institutional change focusing on different aspects of generative or causal mechanisms.

- The ***institutional design*** focuses on the purposeful creation or revision of institutions to address conflicts or social injustices. It locates the purposeful strategic action of individual actors. In this view, institutional arrangements reflect the pursuit of conscious choices and behavior within the bounds that society judges to be prudent and reasonable.
- The ***institutional adaptation*** seeks to explain how and why organizations conform to forces in the institutional environment. Relying on the metaphor of organic growth, we use a life cycle generative mechanism to prescribe how change unfolds programmed or regulated directions. Institutional environment is considered the key mechanism that shapes the structure and actions of institutional actors.
- The ***institutional diffusion*** focuses on how and why specific institutional environments are adopted (selected) and diffused (retained) in a population. Evolutionary process is used to explain how change is driven by competition for scarce resources among entities inhabiting a population.
- The ***collective action*** focuses on processes of institutional change at the interorganizational field level. It explains how a new institutional arrangement is constructed through the political behavior or collective actions of actors who play diverse and partisan roles in the institutional filed or network that emerges around a social movement or technical innovation. It relies on a dialectical theory of change, where confrontations emerge between conflicting entities espousing opposing thesis and antithesis that collide to produce a synthesis, which in time becomes the thesis for the next cycle of a dialectical progression of change.

Table 2-2: Four key perspectives on institutional innovation

Dimension	*Institutional Design*	*Institutional Adaptation*	*Institutional Diffusion*	*Collective Action*
Question	What actions and roles do individual actors undertake to create or change an institutional arrangement?	How do individual organizations adapt to their institutional environment? Why do organizations adopt similar institutions?	How do institutional arrangements reproduce, diffuse, or decline in a population or organizational field? Why are organizations so alike?	How do institutions emerge to facilitate or constrain social movements or technological innovations?
Focal institutional actors	Individual entrepreneurial actor(s) with bounded agency: affordance and partisan mutual adjustment	Individual organizational actors adapting (proactively or reactively) to institutional environments	Population or industry of organizations exposed to same institutional environment	Networks of distributed and partisan actors in an interorganizational field who are embedded in a collective process of creating or revising institutions
Generative mechanism	Purposeful social construction and strategies by actor to solve a problem or undo an injustice	Institutional environmental beliefs, pressures, or regulations to which organizational actor must adapt to be legitimate	Competition for scarce resources forces actors to imitate and conform to legitimate institutional practices	Recognition of an institutional problem, barrier, or injustice among groups of social or technical entrepreneurs

Process: event sequence	A dialectical process of creating work rules that resolve conflicts or address unprecedented cases	Coercive, normative, and mimetic processes of internal organizational adaptation and change	Evolutionary processes of variation, selection, and retention of institutional forms	Collective political events dealing with processes of framing and mobilizing structures and opportunities for institutional reform
Outcome	New "rules of the game" that enable and constrain actors by changing their rights, duties, or roles	Organizational legitimacy by adopting isomorphic institutional arrangements	Institutionalization or de-instituionalization of institutional arrangements in a population of actors	Institutional precedent, a new or changed working rule, an institutional innovation

Source: Van de Ven and Hargrave (2004)

Powell & DiMaggio (1991) introduced the notion of institutional entrepreneurship in institutional studies to explain how actors can contribute to changing institutions despite pressure towards stasis, and thereby reintroducing actors' agency to institutional analysis. Early institutional studies considered mainly the constraints under which actors operate and other effects of institutions on actors and works on institutional entrepreneurship aimed at building a theory of action. However, when it came to explaining change, the role of actors and action in the creation, diffusion, and stabilization of institutions was unclear (Battilana *et al.*, 2009). Most organizational and agency studies considered that actors are embedded in the institutional environment which already defined and confined the "actions" of institutional actors. Such simplistic view of imposing agency constrains on institutional actors would have undermined the importance of institutional entrepreneurship as change agents who initiate divergent changes, namely, changes that break the institutional status quote in a field of actions and thereby possibly contribute to transforming existing institutions or creating a new one. It presents to the author an opportunity to study actors-driven institutional change (the actors' framing, mobilization and political actions) considering the field characteristics (sociopolitical effects), degree of divergent change, external network dynamics and internal network cohesiveness.

Why was institutional change selected as the main theory for this study? China's FinTech firms have established a new ecosystem of consumer e-finance such as mobile payment, e-banking, P2P lending and online WMPs. It starts challenging the dominance of traditional banks' lending and deposit business. The trend of a cashless society also threatens the sovereignty of Renminbi as some businessmen prefer mobile money over cash. In return, traditional banks lobby the regulators to impose a daily cap on the amount of cash an individual can transfer between their mobile and bank accounts. With the launch of NetsUnion, a clearing house for mobile payment in China, regulators are putting more supervisions on mobile transactions, addressing its concerns over money-laundering, depletion of banks deposits and the weakening of banks' competitiveness. In response to regulatory changes, FinTech firms start leveraging technology instead of financial services, by stressing their roles to help banks identify smaller borrowers, manage lending risks, and expand financial inclusion to rural areas for the unbanked.

China's banking revolution shows that a few individuals or groups, such as FinTech firms, envision the need for some forms of institutional change to address existing issues (such as poor financial inclusion and innovation) or grasping opportunities (such as mobile banking and e-finance) and then initiate actions consistent with their intentions (such as challenging the financial industry inefficiency and monopoly power). However, in the beginning, they did not have the resources, power or legitimacy to initiate institutional change by themselves to restructure the institutional arrangement. Instead, they engaged in a grassroots form of organizing networks to build their coalition, and then allied themselves with other activists and groups with complementary interests and resources (such as promoting the use of QR code mobile payment). Groups with an opposing view did the same (such as developing their own e-commerce platforms and instituting the NetsUnion platform to acquire e-consumers' transactional data). As a result, many diverse and partisan actors (such as FinTech operators, bankers, regulators, insurers, trust firms, merchants and financial consumers) became engaged and embedded in the path-dependent processes involving numerous vents over an extended period (as detailed in the previous section on "FinTech and its implications on China's financial system).

In the case of China's banking reform, institutional innovations at industrial and firm levels were developed through a political process in which actors contributed to a larger solution by recombining inherited practices, emerging technologies, new institutions, polices, industry protocol and organizational structure to address their own unique and partisan interests. In this classical case, the leaders of the movements (such as Alipay and WeChat Pay representing the

FinTech group and big four state-owned commercial banks (SOCBs) representing the traditional bank group) displayed political savvy, due to the nature of China's socialist market economy, in understanding the interests of the other players and regulators in the actors network, as well as the ability to frame the change agenda in ways that appealed to the interest and identities of these actors and the overall society in general.

At firm level, institutional actors (such as FinTech firms and banks) instigated a series institutional design activity to redefine their institutional structures, norms, rules, competencies, procedures, powers and duties to address the conflicts, challenges and opportunities brought by the competing actors in the industry. To create a normative, cognitive and coercive institutional environment, China's regulators, such as CBRC, issued new financial policies, rules and regulations to frame the work rules for the new institutional environment. Institutional actors were required to adapt, either proactively or reactively, to the new institutional environment to be legitimate. Finally, some smaller players in the industry replicated and confirmed to the legitimate institutional practices created by the dominate actors to stay in the game.

At industry level, this process of change reflects the working of a dialectical model in which a synthesis of new institutional policies and structures emerges from conflict and contestation among the colliding groups espousing opposing thesis and antithesis. In China, a new form of hybrid FinTech-bank institutional arrangement emerges whereby FinTech firms are making equity investment in banks and vice versa. Their business relationship also changed from direct competition to co-opetition. Technological innovation in FinTech also induced social movements such as cashless society, consumer data protection, financial fraud and scandals, and exportation/diffusion of China's FinTech experience (Alipay and WeChat Pay applications) to Asian and European countries along with China's tourist footsteps.

The above analysis shows that institutional change theory can be used to explain the banking revolution in China. The next section will review some key concepts or theories in institutional design, adaptation, diffusion and collective action, identify the similarities and differences in depictions of institutional change, reveal some of the value-added contributions that each field makes to understanding processes of institutional innovation or change, and finally relate such literature to the literature on China's FinTech development and change. A contingent model of institutional innovation based on China's experience is considered to be an important addition that complements the existing collection of models of change in the institutional literature. Although the existing literature has provided a good understanding of how institutional arrangements are developed, adopted and diffused individually or collectively, there are limited explanations on how organizations select, adopt and advance from

one form of institutional innovation to another. Besides, while institutional researchers have begun to account for conflicts, power, and politics in their explanations of institutional change, further attention still needs to be devoted to the implications of these concepts for understanding institutional change or innovation (Hargrave and Van de Ven, 2006).

In the discussion part of this section, the author described how a contingent model fills an important gap that is not addressed by existing models of institutional innovation. This study will also explore how interactions among different models of institutional innovation and explain various stages and cycles in the temporal duration of an institution. The author will also compare and discuss the implications of the arguments and generalizability of this study and finally frame the research agenda of this thesis.

2.2.1 Institutional Design

Institutional design researchers view institutions as a reflection of conscious and intentional decisions and **actions that individual actors take to create or change institutional arrangements to resolve conflicts. They try to set new rules of the game that enable and constrain actors by changing their rights, duties, or roles** (Hargrave and Van de Ven, 2006). Institutional design economists can be broadly categorized into two groups, namely, the old and the new.

The old institutional economists are represented by John R. Commons (1950) and Douglas C. North (1990). Commons (1950) argued that an institution consists of a set of rights and duties for individuals, an authority for enforcing them, and some degree of adherence to societal norms of prudent reasonable behavior. North (1990) shared Commons' view. He defined institution as the "rules of the game" to reduce the costs of exchange and production by defining opportunities and directing efforts. Selznick (1957), Hurwicz (1987) and Ruttan (2001) extended Commons' traditional view to institutional change model where work rules emerge / are redefined to address human problems. Selznick (1957) believed that institutional change consists of processes that are intentionally initiated and shepherded by organizational leaders. Hurwicz (1987) held that institutional changes that appear to be induced by changes in external factors contain an element of invention reflected in conscious design. Ruttan (2001) viewed institutional change as endogenous to the system under investigation, and as induced by technological and resource factors (external determinants view).

The new institutional economists are represented by Powell and DiMaggio (1991), Oliver (1991), Stinchcombe (1997), and Barley and Tolbert (1997) respectively. Powell and DiMaggio (1991) argued that organizations adopt new business practices for not only efficiency, but also the need to maintain confidence among external stakeholders. The confirmative process makes them less creative and innovative in their practices and leads to institutional isomorphism. Oliver (1991) explained five strategic responses to institutional pressures, namely, acquiescence (habit, imitation, compliance), compromise (balance, pacification, bargaining), avoidance (concealment, buffering, escape), defiance (dismissal, challenge, attack), and manipulation (co-optation, influence, control). Barley and Tolbert (1997) proposed four stages of institutionalization, namely, encoding, enactment, revision or replication, and objectification or externalization. They viewed institutional change as primarily endogenous to the system of study, and as more likely to be intentional rather than unconscious. Lindblom (1965) described the process of "partisan mutual adjustment" where interdependent and opposing forces reach mutual decisions on public policy. Participants in this process manipulate each other through persuasion, authority, appeals to conventions, votes and wealth.

In summary, **the old institutional economists view institutional change as processes of collective action to resolve conflicts among individuals that are in opposition due to resource scarcity. The new institutional researchers consider that institutional change occurs when actors question the norm or "taken-for-granted" scripts. The change is intentional, purposeful, manipulative, responsive and confirmative to situational changes.** Both schools of thought regard institutional designs to be initiated within the boundaries of an organization or the broader institutional context or environment, within which the actors or change agents are embedded. **The author considers the new institutional economists' approach more relevant to China's institutional environment, whereby culture, institutions, politics and social relations are not just toolkits for actors, but also influence actors' cognition and actions in important and often unconscious ways.** Their status as social acts implies a need to account for institutions and social relations that constrain and enable the choices of actors, the influence of actors' actions and the structures in which they are embedded, and ultimately the recursive nature of relations between intuitions and actions (Battilana *et al.*, 2009). For example, "the socialist market economy with Chinese characteristics" is the economic system and model of economic development employed in China. The system is based on the predominance of public ownership and SOEs within a market economy. SOEs are much larger in size and fewer in number in China, with Chinese central government-owned SOEs clustered in "strategic sectors" including banking, finance, mining,

energy, transportation, telecommunications and public utilities. Profits retained by SOEs are used to pay managers excessively high salaries rather than being distributed amongst the population. Although the State has announced in 2014 that efforts would be made to put in place a plan to rationalize the salaries of SOE managers, they are still well-paid (including payroll, bonuses, child and medical benefits, accommodation and other living allowances) compared to their counterparts in the private sector. Under such arrangement, SOEs' actors are not motivated to challenge the norms nor initiate any divergent change in the existing institutional arrangement. To promote innovation in SOEs, the State must open the door to innovation in the private sector (such as FinTech) to force SOEs (traditional banks) to become more efficient and more market-oriented. These externalities and internalities, either positive or negative, shall be considered when analyzing intuitional design, change or innovation in China.

In the discussion of institutional design or creation, it is necessary to incorporate the actions and influences of institutional entrepreneurship. Institutional entrepreneurs are change agents, but not all change agents can be regarded as institutional entrepreneurs. **Only actors who initiate divergent changes, or changes that break with the institutionalized template or logics for organizing within a given institutional context and those who actively lead and participate in the implementation of these changes, can be regarded as institutional entrepreneurs** (Battilana *et al.*, 2009). **Changes that are diverse from the existing institutional arrangements are qualified as institutional design**. For example, in a low-trust society like China, online shopping was unpopular as buyers worried that sellers would not deliver the goods, goods were of low quality and/or it would be difficult to get refund or exchange after the sellers received the payment. To solve this problem, Taobao online shopping (a subsidiary of Alibaba Group) introduced an escrow service in 2004 that would hold on the payments until the buyer received their purchase before releasing the money to the seller. If the buyers were not satisfied with the goods, they would have seven days to regret and return the goods to the sellers. The on-hold money would be returned to the buyers. In this case, Alipay initiated a divergent change in the online shopping institutional arrangement whereby the online platform operator was acting as not only a retailer but also a trustee. By implementing a change that diverged from the institutionalized model for organizing within online shopping platform (originated from the eBay's and Amazon's model in the US), Alibaba acted as an institutional entrepreneur.

What are the enabling conditions for institutional design? Battilana *et al.* (2009) proposed two categories of enabling conditions, namely, **field characteristics and actors' social**

position. **Field-level conditions include economic and political crisis, scarcity of resources, social upheaval, technological disruption, competitive discontinuity, and regulatory changes that might disturb the socially constructed, field-level consensus and eventually invite the introduction of novel ideas** (Child *et al.*, 2007; Greenwood *et al.*, 2002). For example, after world war II, the US was simultaneously the world's largest producer and consumer of oil. The global market was dominated by a group of multinational companies known as the "Seven Sisters", five of which were headquartered in the US. Oil-exporting countries were eventually motivated to form OPEC as a counterweight to this concentration of political and economic power. The formation of OPEC marked a turning point toward national sovereignty over natural resources, and OPEC decisions have played a prominent role in the global oil market and international relations. The effect can be particularly strong when wars or civil disorders lead to extended interruptions in supply.

Degree of heterogeneity, the variation in institutional arrangement, can also give rise to institutional incompatibilities that become a source of internal contradiction, produce unstable tension in a given system and likely trigger actor's reflective capacity to question the existing arrangements, and possibility diverge from them (Blackburn, 1994). For example, the emergence of Java standard was to create a general-purpose computer-programming language that can run on all platforms that support Java without the need for recompilation. This helped resolve contradictions in multiple programming languages that required individual compilation and supporting infrastructures. Low degrees of institutionalization are also associated with higher levels of uncertainty (loose coupling) in the institutional order, which might provide opportunities for strategic action (Philips *et al.*, 2000). For example, the traditional banking system, more so SOCBs, is a highly-regulated industry with relatively fixed institutional arrangements and mature governance and controls. It is less receptive to divergent change compared to the FinTech industry which has a technology DNA that is innovative, fragile and less regulated.

Actors' social position might affect both their perception of a field (Bourdieu, 1977) **and their access to the resources needed to engage in institutional change or innovation** (Lawrence, 1999). Battilana *et al.* (2009) found that institutional design can be initiated at the center or periphery of the field depending on the field's heterogeneity and institutionalization. For example, **institutional change is more likely initiated at the center of a field, from the tone-at-the-top, and in high-status organizations such as large banks and multinationals. The intersection between fields in large organizations might more likely generate new ideas and spawn innovative practices from the actor's interaction at the core. On the**

contrary, new FinTech startups which have low field heterogeneity and institutionalization might have more divergent change generated from the periphery of the field through open innovation and cross-institutional/industrial collaboration. The status of the organization in which an individual actor is embedded as well as her hierarchical position and informal network position within an organization are also likely to influence, both independently and jointly, the likelihood that a given actor will engage in institutional change or innovation (Battilana *et al.*, 2009). This insight **requires further comparative studies on how interaction between individual and organizational levels of analysis influences the institutional entrepreneurship and the process by which divergent change is implemented.**

According to Battilana *et al.* (2009), **institutional design can be categorized into three key activities, namely, developing a vision, mobilizing people behind that vision, and motivating them to achieve and sustain it. Visioning involves framing the institutional change that (1) describes the problem it helps to resolve (*diagnostic framing*); (2) is preferred over existing arrangements (*prognostic framing*); and (3) is motivated by compelling reasons (*motivational framing*)** (Markowiz, 2007; Misangyi, Weaver & Elms, 2008). Diagnostic framing seeks to make explicit the failing of the existing organization or boarder field, expose problems with current institutionalized practices and assign blame (Suddaby & Greenwood, 2005). However, Leblebici *et al.* (1991) found that the powerful organizations in the field were not the innovators, unless requested by regulation, because they had invested their resources in maintaining the status quo or establishing new practices that confirmed established convention. Therefore, outsiders are needed to introduce new technologies and business models, disrupt the current institutional arrangement and redefine the actors' roles, duties and powers in the field. For example, the existing financial sector in China has long been dominated by the formal banking section, where large SOCBs (the big five SOE banks still controlling about half of the total assets in the banking industry in China) typically serve SOEs and high-net worth customers, leaving SMEs underserved, though they account for a large share of GDP, employment and innovations. Recognizing the financing difficulties facing SMEs and FinTech firms (such as Alibaba, JD.com and Suning) framed a problem statement in the current bank lending process. In response, an e-financing model was proposed by leveraging the credit and behavioral data of their customers through transactions and credit performance on their e-commerce platforms, which are able to develop proprietary credit assessment models to evaluate their borrowers' creditworthiness using big data analytical techniques to produce lending decision in a fraction of few seconds. Through this operation model, these **FinTech firms can provide an easy and convenient source of alternative**

finance to SMEs without the need for collateral. Such a *diagnostic framing* method help gain legitimacy from the regulators over the new institutional arrangement whereby a convergence of e-commerce and e-financing model begin to emerge.

***Prognostic framing*, involving casting an institutional change proposal as superior to a previous arrangement,** engages the institutional entrepreneur in de-legitimating existing institutional arrangements and those supported by opponents and legitimating stakeholders and other potential allies of the new institutional arrangement. This effort implies theorizing the institutional proposal in a way that resonates with the interests, values, and problems of potential allies (Suddaby & Greenwood, 2005). For example, in 2016, the Chinese government completed the abolishment of business tax (BT) and replaced it with value-added tax (VAT) as a concrete step to deepen reform of China's taxation sector. It took three years to complete the tax reform to reduce the tax burdens for all industries. The tax reform and structural tax cuts appealed very well to the interests of individual and corporate taxpayers. Although taxpayers needed to maintain proper records of VAT input and output taxes to be eligible for tax deduction, the increased benefits from lower tax payment certainly helped promote the institutional change in the finance, purchase and sales systems of records.

***Motivational framing* entails providing compelling reasons to support the new vision being promoted** (Misangyi *et al.*, 2008). Institutional entrepreneurs must possess sufficient social skills, including the ability to analyze and secure the cooperation, assess the configuration, and act according to their positions and the positions of other agents in the field (Fligstein, 2001). For example, socially responsible mutual funds companies operating as institutional entrepreneurs in the US relied on a form of motivational framing, which insisted on the fact that SR funds can deliver both access to high financial returns and effective social change. Another example is QR code payment promotion and adoption in China. Taxi drivers, food restaurant owners, sundry shops operators, fish markets and merchants were motivated to accept QR code payment to avoid the problems of having inadequate changes to customers. The digital currency can also be used to buy gasoline at petrol station, purchase goods from online shopping or other merchants, or withdraw cash from banks.

***Resource mobilization.* The mobilization process entails political strategies to tactically deal with "institutional defenders"** whose organizational privilege and social position within the organizational fields might be affected by the institutional change (Powell & DiMaggio, 1991). To challenge the key actors' powers in the intuitional arrangement, institutional entrepreneurs typically need to mobilize allies, cultivate alliances, and cooperate to secure endorsement and support for the implementation of divergent change (Battilana *et al.*,

2009). For example, worrying about large deposits of money continuously transferring out of the banking system into third-party payment accounts, traditional banks (led by large SOCBs) begin to lobby regulators to control or limit the amount of payment that can be processed by third-party payment platforms. In July 2016, PBOC made it clear that a strict daily transaction cap shall be placed on third-party payment service accounts, given that their original intent was to facilitate e-commerce, which typically involves smaller amounts per transaction. Based on the new regulation, third-party mobile payment service providers must ensure that each and every user account bears the real name of the account holder. In addition, accounts will be categorized into three types based on security requirements, capped with maximum annual payments. If transactions are verified using two-step verification without browser plugins, the daily limit is set a little under $800. When only one method of verification is used, the limit is set to the lowest threshold of just over $150.

Financial resources and resources relating to social position, such as formal authority and social capital, also play a key role in institutional change. Key actors use financial resources to subsidize or sponsor the transitional costs, bypass sanctions and/or provide additional values to gain support from important stakeholders. For example, Sun Microsystem was able to induce systems assemblers, software firms, and computer manufacturers to contribute to the network-centric approach to computing it was proposing to oppose Microsoft's Windows by providing free access to Java instead of charging for the resources (Garud *et al.*, 2002). Social position can also help institutional entrepreneurs mobilize allies to support the implementation of divergent change. For example, high-status organizations can leverage their status to impose divergent changes in a field of activity (Sherer and Lee, 2002). Formal authority refers to an actor's legitimacy power to make regulations and/or authority power to make important decisions (Phillips *et al.*, 2000). Formal authority can help institutional entrepreneurs legitimize divergent ideas, frame stories and promote acknowledgement and "consumption" of their discourse by other actors (Phillips, Lawrence & Hardy, 2004). Social capital refers to actors' informal network positions. It accrues to one's position in a web of social relations that provides access to information and political supports. Institutional entrepreneurs can leverage social capital to influence others, such as severing links between selected groups and leading or organizing collective actions among diversified stakeholders (Maguire *et al.*, 2004). However, until recently, the resources used by institutional entrepreneurs to mobilize change have seldom been studied (Battilana *et al.*, 2009).

The institutional design process is also influenced by field characteristics, such as level of institutionalization and fragmentation (Wijen & Ansari, 2007). Institutional entrepreneurs

who operate in fields with high levels of institutionalization frame discourses that resonate with the interests and values of members of the dominant coalition (Suddaby & Greenwood, 2005). When operating in less institutionalized fields, they might formulate a vision that aims to establish a common identity specific to the actors who will be part of the new fields (Markowitz, 2007) and legitimate the new field in the eyes of major stakeholders on whom field members are likely to depend (Rao *et al.* 2000; Dejean *et al.*, 2004; Koene, 2006). For example, when advocating divergent change brought by Alipay, Jack Ma, founder of Alibaba group, established himself as "disruptor" to the financial services and payments industry, a necessity to break the monopoly power and credit bias in traditional banking system with a new set of "rules of the game" to solve the difficulties facing SMEs and create access to financial inclusion for the unbanked groups. This is consistent with Tuzlukaya and Kirkbesogle's (2015) theoretical model which proposes that (1) in organizational networks with a high level of embeddedness, the probability of institutional change is higher compared to those with a low embeddedness level; (2) In an open organizational networks, the probability of realizing institutional change is higher compared to a closed networks; and (3) the probability of the realization of institutional change is higher if the density of sparse market relationships established with different network is high. Jack Ma used his social capital and embedded organizational network relationships to spread ideas and gain support to realize an institutional change movement. Compared to traditional banking, a closed social network in which actors are closely connected, share a common established ideology, and interact in a repetitive cycle, emergent technology networks are more open to forming new institutional collaboration, spreading and applying new ideas, and undertaking radical institutional change. The movement of new knowledge across different clusters in the technological networks also helps institutional entrepreneurs gain powers in terms of legitimacy, credibility and strategic importance (social capital) to initiate a change in the network.

However, **we know little about how institutional entrepreneurs mobilize financial and social resource, and what approach work best in which contexts** (Battilana *et al.*, 2009)**. The contextual issue in institutional design is obviously an under-researched area, particularly, in a socialist market economy environment, such as China, with rigorous regulatory controls and public policy influences.** Also, the activities involved in motivating actors to realize and sustain a vision, or to institutionalize change, have been studied the least in the literature on institutional design and remain the subject of future research. This presents a fantastic opportunity to explore and advance the body of knowledge in the areas of embedded agency, contextual framework and change sustainability in institutional design.

Collective institutional design can also be the outcome of uncoordinated activities. Dorado (2005) labeled it as "institutional partaking" in which institutional change is a result of the accumulation of countless institutional entrepreneurs' uncoordinated divergent actions. When agency is considered to be distributed, politics and collective mobilization become central to understanding how diverse actors can coalesce. Developing a distributed view of agency should also lead to understanding of how institutional entrepreneurs are able to ensure stabilization and possible diffusion of institutional design at the field level (Battilana *et al.*, 2009). After all, institutional design is a complex process that involves different types of actors (such as individual, group, organization and allies). Multi-level studies that take account of the filed, community, organizational and individual-levels of analysis remain to be developed (Reay *et al.*, 2006; Scott, 2001; Strang & Sine, 2002). **This presents a research view of "decoupling" and then "recoupling" the embedded complexity within the institutional field to study the institutional design issues, factors and processes from different lens and distances.**

Another emerging line of enquiry examines how field conditions shape entrepreneurial activities, which might, in turn, shape the field conditions. For example, in Sine and David's (2003) study of the US electric power industry, they documented how environmental jolts stimulate entrepreneurial activities by destabilizing the institutional structures that otherwise impede such activities. Encouraged by this destabilization and crisis, entrepreneurs generate new solutions or repackage existing practices and collectively create a "solution bazaar" of alternatives to the incumbent institution. Therefore, entrepreneurship and institutional design processes can be intertwined, as is the case when entrepreneurs develop business models that break the existing ones.

Below is another example in China on how institutional entrepreneurs leverage on filed conditions to initiate an institutional design and legitimate it. In 2016, Alibaba started to promote the concept of "New Retail" in China which combines elements of offline and online retail to make them an integral whole. Big Data stands at the core of New Retail. Data on consumers' preferences, shopping habits, and sales enable efficient delivery to consumers and reduce surplus inventory, which are the two major retail challenges. The integration of online, offline and logistics creates an omni-channel shopping experience (re-institutionalization), expanding the consumer base and increasing profitability. The New Retail model came at a time when the performance of traditional retail stores looked bleak, and e-commerce was approaching a bottleneck (the crisis). By repacking the "New Retail" concept, Alibaba successfully legitimatized a new institutional arrangement of "flagship e-commerce platform",

represented by Alibaba's Tmall, JD.com and Sunning, which have evolved to provide an "Omni-Channel" shopping experience that empowers brands with data. Leading brands began to set up virtual flagship stores in these mega e-commerce platforms to gain insights on consumer data (trends, preferences and behavior), manage their inventory and logistics mapping to optimize sales and lower supply chain costs. Traditional malls are transforming into restaurant stores, entertainment centers (amusement parks and cinemas) and experience stores or showrooms where consumers' presence and interactions are essential (repackaging existing practices). The "New Retail" emerged as a new consumer-centric model where brands begin to actively find ways to stimulate consumer needs, identify look-alike consumers and turn consumers into brand ambassadors using data generated from consumers' activities. Another example is AliLoan, an online commercial microfinance instrument that provides loans to low-income online platform operators and online consumers with sound credit rating based on knowledge about their transaction volume and activities in Alibaba's e-commerce platform. AliLoan can also be considered a form of institutional design, because it combined two potentially competing institutional logics in an innovative way, thereby diverging from both. On the one hand, it is driven by the value of social development – to help the poor disenfranchised from conventional banks by democratizing access to credit and other financial services. On the other hand, it is regulated by banking laws that require that fiduciary obligations towards investors and depositors be fulfilled (Battilana & Dorado, 2007).

The concept of institutional design is thus the process of introducing divergent changes in existing institutions in each environment. It involves the activities of institutional entrepreneurs to develop a vision, mobilize people behind that vision, and motivate them to achieve and sustain it. The institutional process could be influenced by the field characteristics and yield different results. This section also elaborated **the paradox of embedded agency in the institutional and agency theories which call for more research works to understand not only the divergent change process, but also how actors, in particular, policymakers, technocrats, traditions and the minorities, might reform institutions.** Adopting the view of new institutional researchers, from the perspective of institutional change logics, our research will analyze the activities of key actors in the context of China's financial system, how they create and/or redefine the institutional arrangement with an aim to break the current taken-for-granted practices by leveraging on the unprecedent opportunities brought by China's financial reform and FinTech technological movements. These changes may likely (in case of disruptive and generalizable innovation) set new rules of the game that may enable or constrain actions of other actors by changing their rights, duties, or roles. **The study also calls for an integration**

approach to institutional, agency, social movement, actors' network and entrepreneurship, change and contingency theories.

2.2.2 Institutional Adaptation

Researchers from the institutional adaptation school look at how organizations conform or adapt to the standard norms, beliefs, and rules in the institutional environment in order to achieve legitimacy, which enables them to acquire resources and improve their chances of survival. The institutional adaptation perspective is primarily concerned with changes in the characteristics of institutional actors in response to institutional arrangements in organizational environments (Van de Ven and Hargrave, 2004). Scott (2001) noted that Weber (1924/1968) was "*among the first social theorists to call attention to the central importance of legitimacy in social life*".

Adapt to survive. Meyer and Rowan (1977) were among the pioneer researchers who put forward that organizations adapt their structures to conform to the pressure from the institutional environment of peer groups. They argued that modernization drives the development and rationalization of institutionalized rules and elements of organizational structure, and that the organization's concern for legitimacy and survival causes it to adopt these institutional arrangements. They also argued that because conformity with institutional rules can conflict with technical efficiency considerations, organizations must decouple their structures from technical activities so that institutional "myths" are upheld, and legitimacy achieved. They also wrote that powerful organizations often impose their practices and procedures on other organizations as well as actively attempt to build their goals and procedures directly into society as institutional rules. The author cannot fully agree with the above views and offers six formal propositions structured around the key idea of rational organization. The hypotheses were not tested empirically in the thesis. In this conceptual thesis, the author argues that institutional rules enable organizations to incorporate and gain legitimacy, resources and stability, and enhance survival prospects. The adoptions are not immediately connected to any immediate or direct increase in efficiency. Many cases show that organizations adapt to institutional arrangements, which can not only help them gain legitimacy, comply with technical standards, operation rules and regulations, but also help uplift the operation efficiency and technical alignment of the incumbent. For example, using Java standard to write application and webpage can help reduce program compilation time as well as debugging and coding errors

by leveraging on the large Java user groups. Kraatz and Zajac (1996) found supporting evidence from US education system and concluded that organizations make changes in response to the technical environment rather than conform to the demands of the institutional environment. Their findings suggested that less prestigious colleges did not emulate elite one nor the colleges making illegitimate changes suffered harmful performance impacts.

Pressure to conform. DiMaggio and Powell (1983) argued that rationalization of organizations proceeds not so much out of the demands of the marketplace but because of the homogenizing pressure from the state and professions. They have identified three central mechanisms behind institutional isomorphic change and expressed as 11 distinct hypotheses at two levels of analysis, although these had not been tested empirically in the thesis. They described the coercive, mimetic and normative processes that cause organizations to adopt similar structural characteristics. Coercive pressures are those that come in the form of force, persuasion, or the invitation to collude. These might be government mandates or industry standards. Mimetic pressures are found when an organization feels compelled to respond to uncertainty by mimicking another organization. Normative pressures are exerted by professional networks, which diffuse organizational norms developed at universities and other training institutions. Both argued that the rational order that locked humanity due to power and bureaucracy is irreversible. Scott (1987) further identified seven distinct ways that institutions exert pressures on organizational structure, namely, imposition, authorization, inducement, acquisition, imprinting, incorporation, and bypassing of organizational structures. However, they did not explain the relations between pressures, organizational structure and contextual environment.

***Institutional isomorphism*.** Institutional isomorph is higher when organizations are highly dependent on the institutional environment, exist under high uncertainty or ambiguous goals, and/or rely extensively on professionals. In this case, normative pressures on firms are higher and more effective compared to coercive and mimetic pressures. In another example, banks operate in a highly regulated environment, formalize their organizational structures, share common practices, and copy-and-diffuse innovations regularly across organizations. In such case, the driver for high institutional isomorphism is mimetic isomorphic pressures to avoid uncertainties and regulatory dialectics. Galaskiewicz and Wasserman (1989) found that under conditions of uncertainty, organizations tend to mimic the behavior of other “leading” and/or “linked” organizations in the field. Organizational isomorphism (the degree to which organizations adopt similar structures, strategies, and processes) is a significant predictor of organizational legitimacy (the acceptance of an organization by external environment)

(Deephouse,1996). However, the author considers that this view may not be 100% supported in modern society, whereby the organizational structures, strategies and processes may not need to be alike in order to gain legitimacy. For example, Uber adopted a unique business proposition (not car renting model like AVIS, but a car hailing services platform) when it came to the market. It was first "rejected" by car renting industry but subsequently gained significant acceptance from rented car and private car drivers. Hoffman (1997) argued that the shifts in the constituency of the organizational field can drive changes in the field's institutions, which in turn led to changes in organizational structure and culture. He studied how petroleum and chemical companies moved from strongly resisting environmentalism to proactive environmental management from 1960 to 1993.

How do institutions respond to institutional pressures? Greenwood, Suddaby, and Hinings (2002) documented the shift in the profession from an "accounting and tax services only" business model to one of providing a broader array of business services. They found that while change was initiated by the large accounting firms, the professional associations played a key role in legitimating change by making change seem normal and resistance to change unnatural. The proposed a process model of institutional change that includes (1) a precipitating jolt that disturbs existing practices; (2) deinstitutionalization, in which the socially constructed consensus is challenged, and new actors and practices enter; (3) pre-institutionalization, in which organizations innovate independently; (4) theorization, in which deviations from prevailing conventions become abstracted and made available for wider adoption; (5) diffusion, which occurs after successful theorization; and (6) re-institutionalization, the stage at which new ideas and practices become fully institutionalized. They argued that theorization is likely to be more important in highly institutionalized settings. In settings in which instrumental logic dominates, legitimation is likely to take place during the diffusion process, whereas in more normative settings, legitimation shall occur during theorization stage. We will examine this Greenwood and colleagues' process model in the context of FinTech development in China, by inspecting the level of traditional banks' organizational responses to the institutional environment change that are contingent upon a variety of factors, such as organizational attributes, linkages with other actors in the environment, regulatory roles and influences, social-political changes, and consumers' collective response to technological movements. In another example, Scott, Ruef, Mendel, and Caronna (1999) examined the nature and extent of changes in health care delivery systems in San Francisco Bay Area during the period from 1945 to 1995. The changes occurred because of both pressures from the material environment (rising health care costs and technological developments) and institutional pressures such as federal

legislation. They found that it was new logics that resulted in a new governance and funding structure, which necessitated new organizational forms. Scott *et al.* (2000) developed the concept of structuration to explain their findings: *"Structuration is the master process operating at the level of the organizational field as it relates to its wider environments, both material-resource and institutional*". They argued that in a more structured organizational field, there is less room for autonomy and innovation. We will incorporate the theory of structuration in this study as China's banking system is undergoing a massive structural and social change in this respect. The duality of structures, meaning, legitimation and domination (power) shall be included in the study of institutional adaptation in China.

Innovation adaptation. Rogers (1995) claimed that it is misleading to assume that externally mandated innovations can be implemented by adopting organizations without their "reinvention". Reinvention is a process in which adopters modify an innovation to fit their local implementation setting. It facilitates the transition of innovation ownership from developers to implementers and permits tailoring an innovation to the adopting organization's specific needs and constraints. In addition, some autonomy and commitment are needed for adopting unity to identify with and internalize an innovation. Formal compliance or "following the letter of the law" is insufficient for innovation adoption as organizations may behave "bureaupathically" and therefore "negatively" affect the outcome.

Breath Vs Depth implementation. Lindquist and Mauriel (2001) compared two common alternative strategies (depth vs breadth) for adopting and implementing a site-based management institutional innovation in public schools. With the depth strategy, innovation was piloted and debugged in a unit before it is generalized to other organizational units. Breadth strategy, on the other hand, was to implement innovation through successive hierarchical levels across all organizational units simultaneously. They found that breadth strategy was more successful in institutional adoption. The finding was quite contrary to conventional wisdom that successful pilot starts small and spread incrementally will success (Greiner, 1970). They provided several explanations for this finding. With depth strategy, the demonstration project lost visible attention and institutional legitimacy from top-level managers, as their agenda became preoccupied with other pressing management problems. On the contrary, with breath strategy, top management stayed in control of the innovation implementation process increasingly and provided the commitment and budgetary supports. By the same token, it was facing less hurdles and resistances to change when a few components of an innovation were implemented across board to a few supportive stakeholders, than when all components of a program were implemented in depth with all partisan stakeholders involved. With a depth

strategy, it was easier for opposing forces to mobilize efforts to sabotage a "favored" demonstration site than it was to produce positive evidence of the merits and generalizability of an innovation. The author cannot fully agree that a broad strategy is more effective than a depth strategy in institutional adaptation. Instead, the author believes that the success of innovation implementation is linked to a variety of factors.

To summarize, Scott (2001) noted that institutional pressures vary with respect to their sources (for example, which agencies or publics confer legitimacy), the mechanisms by which they are transmitted (such as norms or laws), and their power to shape organizational structure. They also vary over time and space. As we can see above, organizations responses to institutional pressure also vary in terms of adaptation and reinvention. Greenwood and Hinings (1996) found that (1) "organizational resistance to change derives from the normative embeddedness of an organization within an institutional context"; (2) the incidence and pace of radical organizational change will vary across institutional sectors because of differences in the structure of those sectors (the extent of tight coupling and the extent of sectoral permeability); and (3) the incidence and pace of institutional change will vary within sectors because of internal organizational dynamics. In particular, the level of "interest dissatisfaction" within an organization and the level of value commitments determine the organization's response to environmental pressure. In short, organizations do not simply react in the same ways to institutional adaptation. They respond differently and are contingent on various strategic and organizational conditions. It is, therefore, interesting to study the institutional innovations that are developed externally, such as financial technology and platform economy, and imposed on host organizations such as traditional banks, and how they adapt to the institutional environment change brought by the regulatory, technological and social movement changes.

2.2.3 Institutional Diffusion

The study of institutional diffusion focuses on the diffusion of an institutional form or practice within a group of organizations that are in the same institutional environment. In addition, institutional diffusion studies also tend to specify the conditions under which reproduction of an institutional form occurs, the rate at which it happens, and the degree to which it permeates a field of organizations or movement (Van de Ven and Hargrave, 2004). In other words, institutional diffusion studies the generalizability, promotion and retiring of the new forms of norm and practice in the entire industry. Scott (2001) asserted that institutional

diffusion can be usefully categorized with respect to whether diffusion occurs through regulative, normative, or cultural/cognitive processes of change. An evolutionary theory of variation, selection, and retention processes is often used to explain institutional diffusion (Aldrich, 1999).

***Network Ties*.** Rizopoulos and Sergakis (2010) found that MNEs'(multinational enterprises) influence on political decision-making (the host country regulation framework) depends on their insertion into policy networks, which define the institutional framework and the interaction patterns of business/government relations in different issue-areas. In short, organizational survival (and sustainability) is a function of both institutional embeddedness and legitimacy. Westphal, Gulati, and Shortell (1997) integrated institutional and network perspectives to examine the diffusion of an organizational practice, TQM, among U.S. hospitals during the period from 1985 to 1993. They concluded that the social network ties enabled early adopters of an organizational practice to learn about alternative practices so that they could customize their own practices, and they enabled late adopters to learn about and adopt accepted practices so that they could achieve legitimacy. In addition, Sherer and Lee (2002) also argued that legitimacy enables institutional change and that resource scarcity drives such change. Based on their study on the diffusion of human resources practices of law firms, they found that prestigious firms innovate first because they can get away with deviance due to their greater legitimacy, and that less prestigious firms adopt the innovative practices only after these practices have been legitimated. In their examination of the diffusion of the partner-associate structure among Dutch professional service firms during the period from 1925 to 1990, Lee and Pennings (2002) suggested that market feedback (a signal from the technical environment) could foster the legitimacy and therefore diffusion of a new form (a change in the institutional environment). They also noted that diffusion of the organizational innovation depended on size similarity, geographic proximity, and network ties.

For example, China Banking Association (CBA), established in 2011, is a nationwide non-profit self-discipline organization of China's banking sector. As of April 2017, CBA had 620 member units, 35 observer units and 31 professional committees. CBA serves the common interest of its members through the functions of self-discipline, rights protection, coordination and service so as to safeguard lawful rights and maintain market order of the banking sector, and promote the healthy and sustainable development of the industry. In February 2015, representing the LCBs in China, CBA rejected the imposition of adequacy of the total loss-absorbing capacity (TLAC) requirements proposed by FSB on global systemically important banks. CBA argued that the design and implementation of TLAC requirements should take into

consideration the reality and practical issues in emerging economies. China's banking system, for instance, is subject to more strict and prudential supervision compared to those in developed countries because Chinese banks carry out most of social funding functions in their countries and play a critical role in promoting economic development and financial stability. Chinese banks have relatively simple asset/liability structures in their balance sheets. They are less active in global markets and their overseas business account for a rather small part in their total risk weighted assets. It is also difficult for Chinese banks to issue complex structural TLAC debt instruments, as proposed by the new global standards, which might possibly result in competition disadvantage for them with banks from more developed economies. CBA further argued that Chinese banks already complied with the liquidity standard of NSFR issued by Basel Committee. The new TLAC requirements will force Chinese banks to take on their balance sheet large volume of wholesale funding and complex structural debt products, thus increasing their liquidity risk. Leveraging on the network power, CBA has effectively rejected the imposition of TLAC on China's banking system.

Regulative (or coercive) pressure. The state can impose pressure to make organizational procedures and/or structures conform to best practices, arising from the demands of actors on whom the organization is dependent for resources or even with the outright regulation and mandates. Its legitimacy is explained through imposing regulations that control and limit behavior. Behavior is enforced as an outcome of the costs associated with violating the regulations. In other words, regulatory institutions name the rules by which organizations and people operate (Scott, 2001). Using a population ecology approach, Wade, Swaminathan, and Saxon (1998) studied the impact of state-level prohibitions on alcohol production and consumption on the founding and mortality rates of breweries in adjacent, prohibition free states legislation. They identified a process of institutional diffusion in which norms in one state lead to the passage of regulations in that state, which in turn catalyzes the adoption of the norms and eventually regulations in adjacent states. They concluded that government regulations create resource-flow opportunities for organizations not directly affected by the regulations (breweries in adjacent states) but also impose normative pressures on those organizations. In examining the organizational deinstitutionalization process, Oliver (1992) concluded that changing government regulations are likely to be the most powerful external force of institutional change and that performance problems are likely to be the most powerful internal force of change. For example, according to the decisions made by the 18th National Congress of CPC to build an ecological civilization and vigorously promote green, recycling and low-carbon development, in order to profoundly implement the relevant macro-control policies, CBRC (2007) had issued

the Guidelines on Credit Granting for Energy Conservation and Emission Reduction and Green Credit Guidelines (CBRC, 2012), to effectively prevent credit losses and unfavorable impacts caused by environmental and social risks, and to properly carry out green credit implementation. In 2015, the key performance indicators (KPIs) of Green Credit formulated by CBRC were published. All banking institutions are required to facilitate and thoroughly carry out self-assessment of their green credit implementation following the requirements of the Green Credit KPIs and submit the results of the self-assessment to CBRC before May 31 of each year. By June 2018, China's banks had provided a total of 7.26 trillion yuan ($1.09 trillion) in "green credit", which amounted to 9% of total loans from 21 major banks and financial institutions. The loans covered energy saving, green transportation, pollution treatment and resource recycling. It clearly shows how state can exercise its regulative powers to accelerate institutional adoption and diffusion.

Innovation Diffusion Model. Oliver (1992) argued that political, functional and social pressures, both endogenous and exogenous, can result in institutional diffusion or disruption of existing organizational practices. Political pressures essentially are changes in power distribution; functional pressures exist when the functional utility of a practice is questioned, for example, due to automation, environmental and social responsibility; while social pressures include social fragmentation (such as high turnover, unionization and millennium workforce), external forces (such as changes in societal norms, labor supply and workplace expectation); and structural disaggregation, which reduces opportunities for interaction (such as unequal wealth distribution, promotion and leadership opportunity). She concluded that changing government regulations are the most powerful external force of institutional change and that performance problems are the most important internal force of change. Tolbert and Zucker (1996) developed a four-stage conceptual process model of the institutionalization process. In their model, stage (1) is innovation, in which new varieties are generated for efficiency or political reasons; stage (2) is habitualization, during which others try out the new innovation; stage (3) is objectification, which is the process by which the new structural element moves toward a more permanent and widespread status; and stage (4) is sedimentation, when full institutionalization takes place. While Tolbert and Zucker's model brought purposive institutional change into institutional theory by explicitly viewing interest groups as consciously playing a role in the institutionalization process, their model assumes a low resistance by opposing groups, and continued cultural support and promotion by advocacy groups, which do not always exist. Van de Ven and Grazman (1999) argued that the creation of new organizational forms and the diffusion and adaptation of particular forms must be understood

as **coevolutionary** function of influences from institutional environment events, managerial agency, and the accumulated history of an organization's culture, structure, and competencies. Hunt and Aldrich (1998) argued that community evolution involves three factors: (1) technological innovation, which acts as a catalyst for the creation of new organizational forms and new population; (2) entrepreneurial activities that promote and sustain the growth of communities and populations; and (3) processes of legitimation at multiple levels. Using the example of Internet evolution, they concluded that innovation activities are cumulative and incremental. Kraatz and Moore (2002) studied the intersection of environmental institutional pressure and strategic choice, and they argued that more attention should be given to actors as the carriers who promulgate the diffusion of institutional forms.

To summarize, institutional diffusion studies examine the spread and erosion of institutional arrangements within a population or organizational field. Some institutional researchers see reproducibility as a function of institutional and network characteristics. Others suggest the relative contributions of technical and institutional pressures to the diffusion of new organizational forms and practices in the organizational field. This study will apply the concepts and processes of institutional diffusion to study China's banking institutional arrangement reproduction brought by the recent financial reform and FinTech development.

2.2.4 Collective Action

The concept of collective action was first introduced in the literature on social movement (SM) (such as Civil Right Movement from 1964 to 1968) and Technology Innovation Management (TIM) (such as formulation of Java technology standards from 1995 to 2000). SM and TIM researchers generally agreed on using a collective action model to explain interorganizational institutional change, a model that explains change as emerging from a dialectical process in which opposing actors in the institutional field attempt to frame issues, leverage opportunities, build structures and networks to introduce new institutional arrangements. This section will review the collective action theories with a goal to identify how novel institutional arrangements emerge to address a social problem (such as raising of financial inclusion movement for SMEs and rural unbanked groups) and/or develop and commercialize FinTech technology (such as QR code-based mobile payment and cashless society) in China.

Regarding literature on SM , McAdam, McCarthy, and Zald (1996) pointed out that SM researchers have converged on three broad sets of factors to explain the emergence and

development of SM: (1) *mobilizing structures*, which refer to the network actors, organizations, and resources that are available to insurgents to mobilize and engage in collective action; (2) *political opportunity structures*, which are the institutional arrangements or political conditions confronting the movement; (3) *framing processes*, which are the processes by which social movement actors and incumbents strategically contest the meanings of social issues and events.

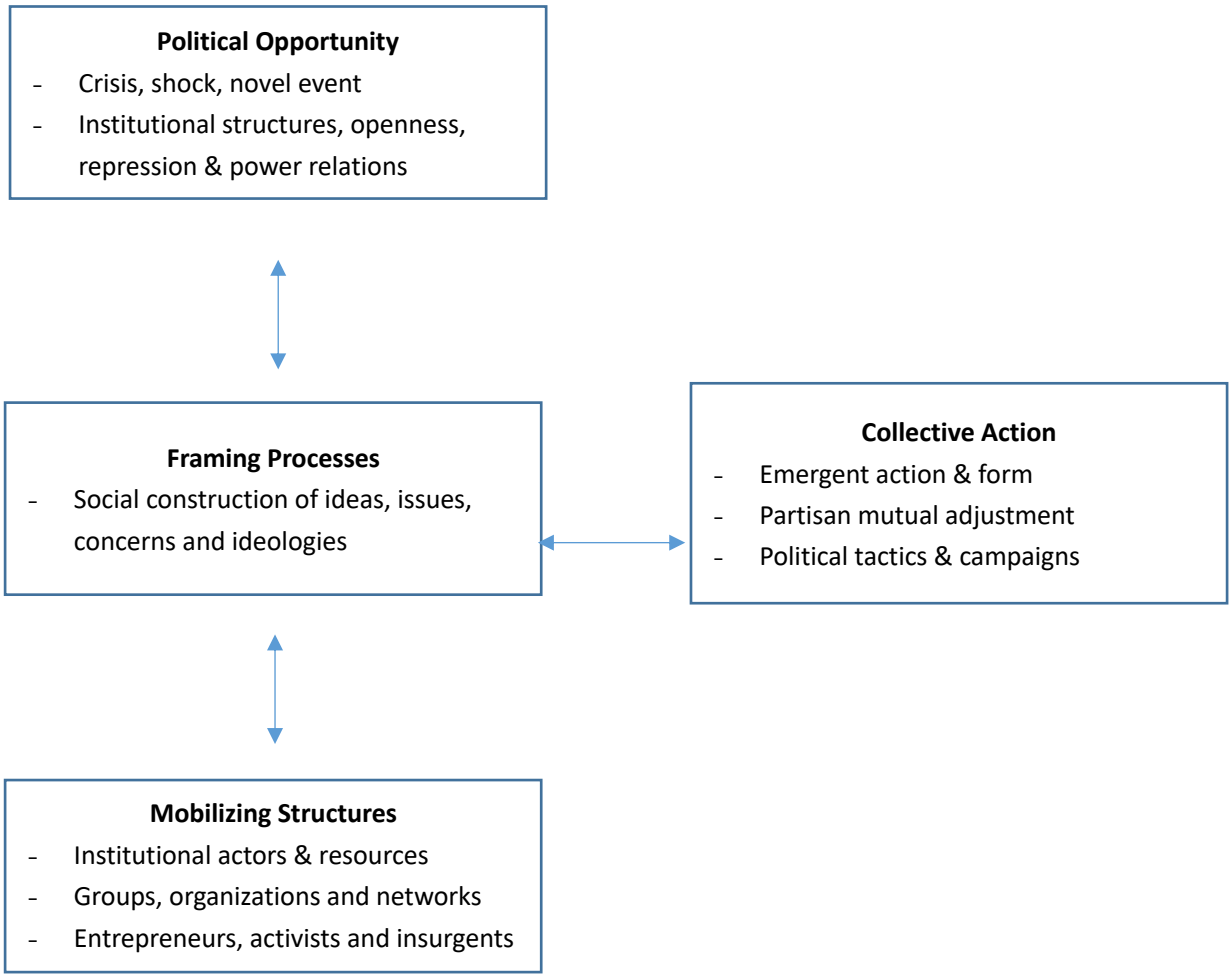

Figure 2- 1 Social Movements Model of Institutional Change

Source: Adapted from McAdam, McCarthy, and Zald (eds.), Comparative Perspectives on Social Movements: Political Opportunities, Mobilizing Structures and Cultural Framings

TIM researchers, on the other hand, took a more dynamic, political and economic view on institutional arrangements (such as intellectual property rights, standards, regulations, policies, legitimating practices and innovation processes) that help or hinder the development and

commercialization of new products, services and technologies. They increasingly view technical and institutional innovations as co-evolving and collective achievements in constructing an industrial infrastructure for economic development among actors who are distributed, partisan and embedded in path-dependent processes (Lounsbury & Ventresca, 2002; Schoonhoven & Romanelli 2001). A few TIM researchers represented by Hinings *et. al.* (2004), presented a stage circular model of the processes and dynamics of institutional change in organizational field. Initially, there are events (jolts) that destabilize established practices (Stage I). At Stage II these events allow the entry and operation of institutional entrepreneurs. But the latest ideas and practices put forward by these entrepreneurs are formulated and gaining legitimacy, constituting Stage III of the model. Stage IV suggests conflict and contestation that takes place at both field and organizational levels to formalize the new patterns of activity. Fields then achieve a degree of stability as they become re-institutionalized (Stage V).

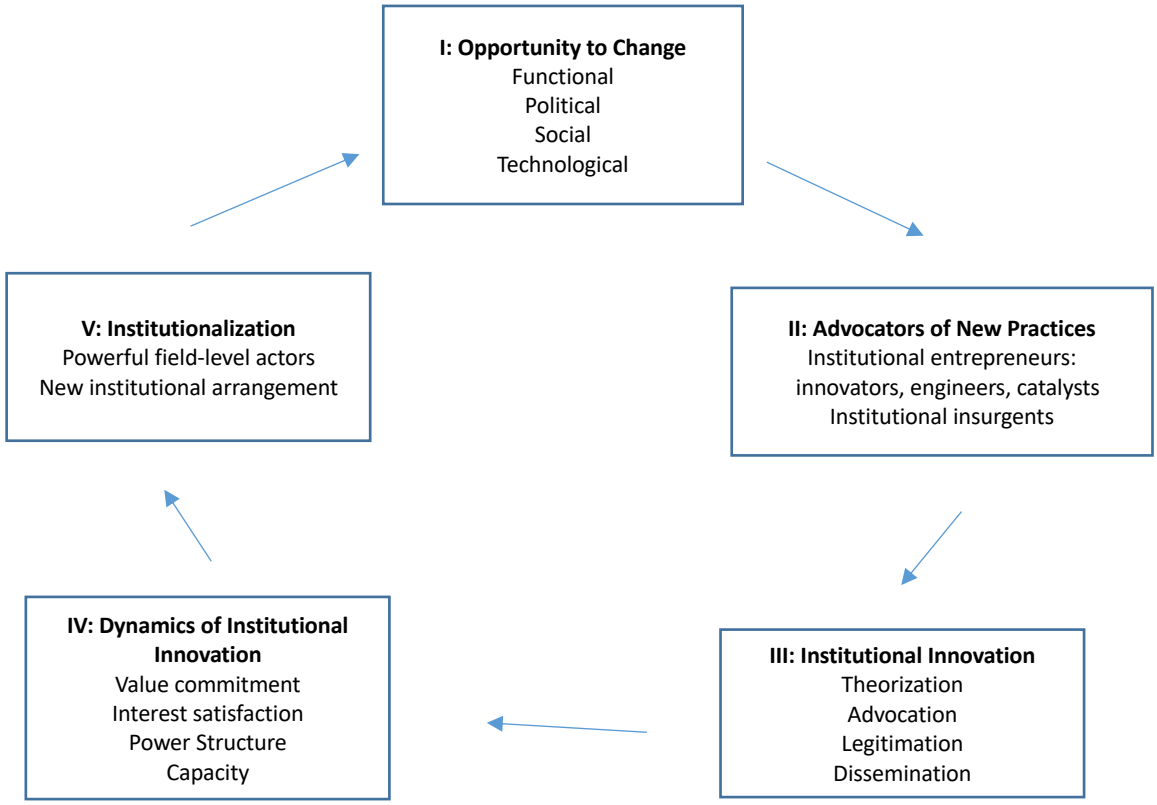

Figure 2- 1 Technology Innovation Model of Institutional Change

Source: Adopted from Hinings, Greenwood, Reay, & Suddaby (2004).

In general, according to Hargrave and Van de Ven's (2006), both SM and TIM researchers pointed out that institutional change involves *framing contests*, in which opposing actors, each seeking to achieve its goals, struggle against one another to frame the meanings of relevant

issues and technologies. They also called attention to the purposive efforts of institutional entrepreneurs to *construct networks* of complementary players that collectively possess the skills and resources needed to achieve success and enact the institutional arrangements that govern actions in the organizational fields. They also called out the *collective action processes of institutional innovation*, in which the form that change takes emerges as diverse and opposed actors collide, each seeking to effect institutional change to change material conditions and achieve its goals. It is important to note that, actors do not simply take the present institutional arrangements, coalitions of actors, and dominant frames as given. They attempt to influence and change the organizational field, although they cannot control the form and pace of change.

However, there are several theoretical gaps and practical limitations in the current literature. In McAdam, McCarthy, and Zald's (1996) SM model, some key facts have not been considered. For example, change always coexists with uncertainties and risks. The change advocator, besides able to leverage on political advantage and resources mobilization ability, needs also to consider adapting to the situational dynamics, altering the framing and collective action approach to optimize results and mitigate risks. Situational adaptation is a key concept in contingent and path-dependent theories. To mobilize the social change, institutional entrepreneurs, key actors who can leverage resources to create new or transform existing institutions, will need to either lead or constellate with other actors in the network to frame the new constructs which will appeal to the interest of the network members. Institutional entrepreneurship is therefore important to social change as a mean of individuals and groups of leadership roles in episodes of institutional building. Lastly, the new institutional arrangement will need to be sustained until the next cycle of change arises. Actors in the network must collectively maintain the system's legitimacy, policy and governance. Institutional entrepreneurship change agent and actor network theories are therefore important to institutional change and innovation. Hinings *et. al*'s (2004) TIM model clearly oversimplified and failed to include some key constructs like framing contests, network construction, collective action process, game playing among the network actors, first-mover advantage and regulatory dialectics in the process of institutional transformation. Game, contingency and compliance theories have not been included in the current TIM literature. For example, how institutional players collide and resolve conflicts between regulation and innovation, dilemma between organizational trajectory and transformation, dialectics between power, distance, control and gain share in the new arrangement have not been discussed in detail. However, both institutional transformation models advocated by McAdam *et al.* (1996) and Hinings *et. al.* (2004) have provided some good insights about political opportunity, framing process,

mobilization structure, collective action, actors network, open innovation, process dynamics and entrepreneurship effects in the institutional innovation process. These insights are considered the theoretical building blocks of this study.

By comparing SM and TM literature, Hargrave and Van de Ven's (2006) found that although a similar view of institutional change was emerging in the two bodies of knowledge, researchers in the two fields had taken somewhat different approaches to the change process. For example, SM researchers emphasized the framing activities in advocating change, while TIM researchers gave more attention to the temporal sequences of change events and stages. Table 2-2 below presents a comparison between these two school of thoughts.

Table 2-2: A comparison of SM and TIM Literature

Institutional Change Process	**SM (Social Movement) Literature**	**TIM (Technology Innovation Movement) Literature**
Framing contests	Calls attention to the creation and manipulation of the meanings of issues.	Deals little with the creation and manipulation of the meanings of innovative technologies.
Construction of network	Describes organizing forms and resources that activists have employed to pursue social change.	Calls attention to the creation of cooperative networks of innovation.
Enactment of institutional arrangements	Describes efforts of activists to challenge and alter "political opportunity structures".	Describes efforts of technology entrepreneurs to build the institutional infrastructure needed to realize innovations.
Collective action processes	Deals little with the dialectical sequences of events by which social change is made.	Describes the contested political processes through which innovative technologies emerge.

Source: Adopted from Hargrave and Van de Ven (2006)

Since the institutional arrangement transformation in China's financial system and industry was mainly driven by a social movement rather than a rapid development in FinTech, this study will discuss more on institutional change brought by technological advancement in the literature to identify gaps, limitations and conflicting views in this body of knowledge. Below are detailed analyses of the constructs in Table 2-2.

Framing Contests. Shared meanings in institutional arrangements are the product of social construction and settlement from battling views. Frame settlements are temporary truces to political conflicts and struggle among opposing coalitions. Representing SM researchers, Benford and Snow (2000) held that framing involves three core tasks: (1) diagnostic framing, which concerns how problems are defined and who is to blame for them; (2) prognostic framing, which involves the articulation of solutions and appropriate strategies for attaining them; and (3) motivational framing, which serves as a "call for action". In the case of China's financial system revolution, the framing processes to modernize the banking system were mainly driven by the Government, social media and researchers in confrontation with the organizational trajectory and inefficiencies at SOCBs, and eventually reshaped the meaning and understanding of inclusive finance.

Representative TIM researchers Rao (2001) and Swaminathan and Wade (2001) observed that, like social movement leaders, technocrats in emerging industries undertake the key task of gaining cognitive and sociopolitical legitimacy. In reviewing the FinTech development in China, both the proponents and opponents of mobile banking engaged in collective framing processes to influence the trajectory of FinTech in China. Traditional bankers who opposed FinTech because of competition disadvantage were to successfully thwart the emergence of FinTech movement because they framed their opposition around sociotechnical argument about potential money laundering, shadowing banking and irregularities in Internet banking that had significant impacts on the financial stability of the country and successfully connect to the "national security master frame" that has broad appeal. As a result, the government has put on-hold several financial innovation attempts, such as its suspension of the launching of QR code payment in March 2014. Later, however, FinTech firms succeeded in proposing mobile banking when they argued that the emergence of FinTech would support the government economic agenda including inclusive finance, consumer finance and supply chain finance to promote financial innovation (and GDP growth). They also reframed FinTech's competency to control financial risks, credit defaults and frauds using big data and advanced analytics capability. As a result, the government re-endorsed the legitimacy of QR code payment in July 2016.

Construction of Networks. SM researchers McAdam and Scott (2005) viewed mobilizing structures, as the resources and organizations through which change agents engage in collective action, the building blocks of social movements and revolutions. Actor network is an important means that enables collective actions. Networks serve as conduits through which new models, concepts, and practices diffuse and become part of an organization's repertoire (Campbell, 2002), the basis of actor network theory. TIM researchers also recognized the importance of

technocrats to enact the networks of actors needed to pursue the development and commercialization of modern technologies. In examining the development of wind turbines in Denmark and the US, Garud and Karnoe (2003) concluded that technology innovation involves distributed, embedded and partisan agency among multiple actors, such as designers, users, research centers and regulators. Each actor focuses on solving a small problem that is shaped by and embedded in the larger technology path, although the actors may have differing interpretive frames and their efforts are fused through a process of creative synthesis. Stuart (2000) further determined that the benefits of forming an alliance with an innovative or a larger firm were more pronounced for young or small firms because it signaled legitimacy for the smaller firms. For example, in 1990s, IBM was a leading brand in personal computer market. Small firms formed an informal alliance of "IBM compatible PC" to ride on IBM's brand value. "IBM compatible" became an important criterion for sales success and growth. At that time, only Apple Macintosh kept significant market share without compatibility with IBM PC.

Observed by the TIM researchers, as the number of organizational units and actors reaches critical mass, a complex network of cooperative and competitive relationships begins to accumulate. This network itself becomes recognized as a new "industrial sector, and takes the form of a hierarchical and loosely coupled system" (Van de Ven *et al.*, 1999). This emerging network consists of the key entrepreneurs and firms that govern, integrate, and play diverse roles in transforming a technological community into a commercially viable industry (Hargrave and Van de Ven, 2006). For example, the R3 blockchain consortium. R3 (R3CEV LLC) is a technology company which leads a consortium of more than 200 firms in research and development of blockchain usage in the financial industry. It has created an open-source distributed ledger platform called Corda for usage in the finance, insurance, healthcare, energy and government sectors. Current members of R3 consortium are represented by major banks in the world. In March 2018, Credit Suisse and ING completed the first live securities lending transaction worth €25 million using an application from HQLAx, a financial technology firm, that was built on Corda.

Enactment of Institutional Arrangements. Fligstein (1996) argued that markets are social constructions that reflect the unique political-cultural constructions of firms and nations and emerge through political processes to provide stability and solutions to competition. He asserts that the content of laws, their applicability to given firms and markets, and the extent and direction of state intervention into the economy are always disputed, and that laws always favor certain groups of firms. For example, during the 2008 financial crisis, the Chinese government adopted a proactive fiscal policy and a moderately easy monetary policy. It also formulated a

package plan to expand domestic demand and boost economic growth. To combat the crisis and maintain steady and relatively fast economic growth, China made timely adjustments to its macroeconomic policies and implemented prudential supervisory policies on financial innovation and risk management. Regulators imposed more stringent supervision over financial innovation and non-traditional banks. Institutional arrangement was conservative, traditional and prudential in general. This is consistent with Compbell's (2002) view on the political opportunity structure in the organizational field as a set of formal and informal political conditions that encourage, discourage, channel, and otherwise affect movement activities and eventually the institutional climax and environment.

TIM researchers have also examined the institutional infrastructure for developing and commercializing technological innovations. Van de Ven and Garud (1989, 1995) developed a framework of institutional infrastructure which consists of *Institutional Regulations* (government agencies, professional trade associations and scientific/technical communities that legitimate, regulate and standardize technology); *Resource Endowment* (advancements in basic scientific and technological knowledge, financing and insurance arrangements, and training of competent professionals); *Consumer Demand* (first movers and early adopters of new technologies); and *Proprietary Activities* (disruptive technologies developers, managers, organizers and promoters who produce the proprietary products and services to meet consumer demand). For example, in 1970s Visa and Master established credit cards system which enabled the cardholders to pay a merchant based on the credit line provided by the card issuer (usually a commercial bank). The cardholders' "promise to pay" for the amount they spent plus other charges to the card issuer had been legitimated by the legal and banking systems (the *institutional regulations*). Cardholders deemed the credit cards as recognition of their social status, credit worthiness and purchasing power. Credit cards also enabled merchants to sell more by relying on the card issuers to evaluate each customer's creditability and limit. Card issuers generated extra income on service fees and late payment interests from cardholders. Collectively, the cardholders, merchants and card issuers created the *consumer demand f*or credit card. Advancement in information security such as smart card (also called chip card or integrated circuit card), insurance arrangement and international collaboration scheme, personal authentication, real-time credit processing, and pin code protection to fight against credit card frauds formed the *resource endowment* for its continued development and mass adoption. Finally, the entire ecosystem and actors' network of cardholder, card-issuing bank, merchant, acquiring bank, credit card association, transaction network, affinity partner, and insurance providers were collectively forming and governing the *Proprietary Activities* in the system.

***Collective Action Process*.** Both SM and TIM researchers pointed out that the process of institutional change is often a political process of mobilizing campaigns to legitimate a social or technical innovation (Rao, 2001). Legitimacy has both cognitive and sociopolitical dimensions (Hannan & Freeman 1989; Aldrich,1999). Cognitive legitimacy refers to the taken-for-granted assumption that an institutional change is desirable, proper, and appropriate within a widely shared system of norms and values (Stryker, 2000; Scott 2001). So sociopolitical legitimacy consists of endorsements and the support of key constituents, such as financial investors, government officials, consumers, and others who play key roles in developing and implementing an innovation (Carroll & Hannan, 2000; Rao, 2001). New institutions gain cognitive legitimacy when entrepreneurs or activists succeed in framing their projects as valid, reliable, and useful (Rao, 2001). For example, the institutionalization of mobile payment (payment service supported by smartphone) at bank and non-bank institutions in Europe was cognitively legitimated by platform economy (Tiwana *et al.*, 2001), financial inclusion (Hannig and Jansen, 2010) and the emergence of Generation Z (born after 1995) which called for easy access, low price and high efficiency in banking transactions. A new payment service model that entailed flexibility, simplicity and speed in almost all the commercial transactions was expected from the service providers. Socio-politically, it was legitimated by the EU Payment Services Directive (PSD1 2007 and PSD2 2013) that was enacted to govern the operations of digitalized payment service for the Single Euro Payment Area (SEPA). They were also intended to encourage non-bank institutions to enter the payment market for relatively small payment and provide them the right to access banking data without having extra authorizations from and additional payments to banks after the transaction had been authenticated by the account owners. It is worth noting that the first Apple smartphone was released in 2007 and after which, the use of smartphones rapidly induced a structural change in consume behavior from social network, travel, mobility to consumption of banking services. The institutionalization process assembled a "political-cultural approach" to "architect the market" (Fligstein 1996) which suggested that the markets were politically negotiated orders, structured by powerful actors (regulators, platform owners and financial consumers) to solve the problems of competition and uncertainty which were information asymmetry, open access to consumer financial data and production of trust in financial transactions.

TIM researchers *Garud et al.* (2002) found that firms socially construct institutions, sponsor their creation, and try to catalyze their legitimation. The process of institutional entrepreneurship assembles dialectical challenges because agency in the structuration of the field creates opposition and mobilizes collective action. Institutional entrepreneurs must both

overcome inertia and take on vested interests. In addition, mobilizing collective action is made difficult by "legitimacy traps". In other words, others will view entrepreneurship as self-interested and not in the best interests of the field as a whole. Garud *et al.* (2002) also documented the problem of co-opetition, the difficulty of achieving cooperation among competitors. They noted that maintaining collective action may be difficult because others may want to start challenging the newly formed institution even as it is emerging. For example, the Java technology standards formulated by Sun Microsystems were challenged by Microsoft and Hewlett Packard where both the later accused the former biased the Java development process to serve itself rather than the interests of technology users.

Key Themes in Collective Actions.

According to Van de Ven and Hargrave (2004), field-level change is produced through collective efforts in which no single actor has power or authority to produce change by itself. Change results from a process of cumulative synthesis in which actors contribute to a larger solution by combining inherited practices, technologies, and institutions to address their own unique and particular problems. Lastly, the process of partial cumulative synthesis is path-dependent but not deterministic. Institutional change is path-dependent because high start-up costs impede the development of new ways; institutions are designed so that they are hard to dismantle; actors accumulate knowledge about how things work; and beneficiaries of the status quote reinforce existing institutions (Campbell, 2002). The author cannot fully agree with these views. Firstly, divergent change can be induced by institutional entrepreneurs. The change may bring reform to the institutional field arrangement through introduction of new technology and business model. Secondly, institutional change can be both incremental and radical. Radical change, such as disruptive technology, can reshape the institutional actor and value distribution networks. Thirdly, path dependence can be both an obstacle and a catalyst to institutional change. Proactive firms may acquire, combine and collide with compatible organizations to expand their institutional competencies, extend their value chains and introduce new thinking and operational models in their traditional business. A case in point is how Alibaba sparked a revolution in asset management in China. In 2013, Tianhong Asset Management teamed up with Alibaba to launch an MMF which would allow investors to access through Alibaba's e-commerce platform. The fund, named Yu'e Bao, lured more than 500 billion yuan ($81 billion) from tens of millions of investors in just nine months. By selling funds through platforms such as Alibaba and WeChat, fund managers managed to tap savings formerly locked up in term deposits at Chinese banks. Tianhong's Yu'e Bao, for instance, offered yields of more than 5%, well above traditional banks' 3.3% deposit interests, while giving investors the ability to

withdraw money at any time. To compete against the Tianhong-Alibaba juggernaut, most big fund managers introduced personalized online-accessible funds with innovative features. The surge in the demand for MMF through online platforms became the industry's most dramatic change. Other developments, such as the introduction of balanced funds, the rising demand for equity-and-bond-linked funds by institutional investors, and government liberalization policies aimed at encouraging equities investments, also fostered growth in the market. In this case, the institutional field change was induced by an organization, which radically changed the asset management model from offline to online and influenced other asset managers to follow the successful path of Yu'e Bao.

Theoretical gaps and pragmatic limitations in the existing literature on collective action

The current collective action model is based on a dialectical theory of change in which opposing actors in the institutional field frame issues, construct networks, mobilize actions, and engage in contested processes (a social-political behavior) to create and change institutions. This view emphasizes the importance of conflict, power and politics disparities in explaining the intuitional change process. The authors believes that this concept is undertheorized considering the following limitations from the dialectic view of change.

Firstly, the majority of the existing literature on SM and TIM suggested that conflict is the core generating mechanism of change and the means by which dialectical tensions play out. This view is rather restrictive and provokes a propaganda of "no conflict no change" in the institutional arrangement. In reality, some changes were brought by opportunity to enhance stakeholders' rents (usually majority) and/or to resolve problems in the current infrastructure. For example, the invention and institution of Java programming language was raised due to not only incompatible programing languages (such as C++ and XML), but also the need to create a general-purpose computer-programming language that is concurrent, class-based, object-oriented. and specifically designed to have as few implementation dependencies as possible, which was highly sought after in the developer community at that time. It was intended to let application developers "write once, run anywhere" (WORA), meaning that compiled Java code can run on all platforms that support Java without the need for recompilation. It helped improve the software engineering process by using a "common language" for machines and decoding, especially for Internet webpage development. Currently, Java remains a de facto standard, controlled through the Java Community Process, and Sun Microsystems made most of its Java implementations available without charge, despite their proprietary software status. It released much of its Java virtual machine (JVM) as free and open-source software (FOSS) under the terms of the GNU General Public License (GPL). As of 2016, Java had been one of the most

popular programming languages in use, particularly for client-server web applications, with a reported nine million developers. In 2007, Sun made all of its JVM's core codes available under free software/open-source distribution terms. In this regard, the author suggests expanding the theoretical building blocks of institutional change to include contingency, network and actor network theories.

Secondly, both SM and TIM researchers suggested that power is a necessary condition for the expression of conflict. Opposing parties must have sufficient power to confront each other and engage in struggle. Political strategies and tactics are the means by which parties engage in conflict. Opposing parties collectively engage in actions to gain support for their demands. The concepts of power and politics are based on the resource dependence theory (Pfeffer & Salancik, 1978) which asserts that firms that control resources on which others are dependent are able to influence (and thus control) the actions of the others. Resources are a basis of power. Power and resource dependence are directly linked. Power is thus relational, situational and potentially mutual. Resource, in a broad term, can include legitimacy power, technological breakthrough, influential leader, institutional trajectory, network power, talents and access to and/or control over critical resources or data. Control over critical resources can help an actor gain power to gain transactional cost economics, bargaining power to mobilize collective actions, and shape the course of institutional change. Researchers have presented rich documentation on political strategies and tactics used by institutional entrepreneurs to effect institutional change (Garud *et al.*, 2002; Rao *et al.*, 2003; Lounsbury *et al.*, 2003). Further work is needed to catalog these political strategies and identify the situations or contingencies in which they work. For example, when the government is strong, assertive or dictatorial (such as China's Communist Party), participative firms tend to compromise on the government policy, and institutional arrangement is shaped by regulators or spearheaded by SOE firms. When the government is weak, new enacted or liberal (such as the US and UK governments), participative firms tend to collectively lobby or bargain to optimize their benefits against the regulations, and institutional arrangement is often the result of collective bargains and powers struggle.

Summary: Institutional Theory Conclusion

Hargrave and Van de Ven's (2006) arrayed the four distinct models of institutional change (institutional design, institutional adaptation, institutional diffusion and collective action) into a typology that is based on the "mode of change" and "focus of analysis" as shown in Figure 2-3 below.

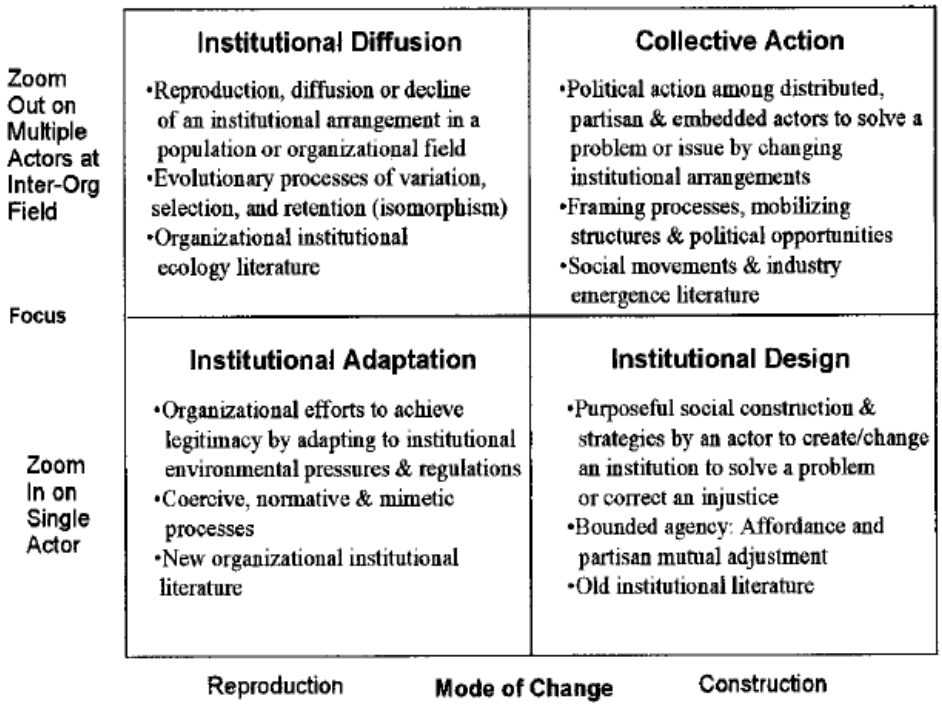

Figure 2-3 Perspectives on institutional change

Source: Van de Ven and Hargrave (2004)

Mode of Change. The institutional design and collective action models focus on the construction of institutional arrangements, whereas the institutional adaptation and institutional diffusion models focus on the reproduction of institutional arrangements among institutional actors through evolutionary and adaptive processes. The design and collective action models emphasize agency as the basis of action, whereas the adaptation and diffusion models emphasize the conditioning effects of institutions on actors.

Focus. The design and adaptation models "zoom in" on the behavior of focal actors who are engaged in designing or adopting an institutional arrangement, whereas the diffusion and collective action models "zoom out" to observe the construction or diffusion of an institutional arrangement among multiple actors at the levels of the industry, population, or interorganizational field.

Each of the four models of change emphasizes a particular mode of change (reproduction or construction) and a particular degree of focus (zoom-in or zoom-out). Each emphasizes a particular aspect of institutional change processes but does not capture the full richness and complexity of these processes. Thus, while each provides a coherent perspective on institutional change, all the perspectives are one-sided. Hargrave and Van de Ven's (2006) concluded that the four models represent a temporal stages or cycle of institutional change which unfold over

phases of emergence, development, implementation and convergence. In the emergence phase, institutional design takes place with key actors signaling their intention to address a social issue or develop a new practice. In the development phase, the network of actors emerge to introduce competing alternative approaches or designs that entail different proposals for institutional change. In the implementation and convergence phases, once a particular institutional design has become legitimated, the new institutional arrangements supporting the winning design are adopted and diffused while the proposals and designs of the losing groups are silenced and submerged (at least temporarily) until the next opportunity arises to mobilize a campaign to replace or change the dominant institutional arrangements. In practice, institutional change is multilayered, multi-model and nested in the hierarchy of institutional actors, arrangements and regulatory environments. The change process is influenced by different actors and conditions, and therefore different combination of motors play a prominent role during the creation, ratification, adoption, diffusion and demise of an institutional arrangement. In most cases, multiple change perspectives should be integrated to explain the observed processes of institutional change. For example, in the reform of China's financial system, some institutions interpreted and recast when they responded to the regulatory environment changes, some reproduced and diffused existing institutional arrangement, and some modified their structural responses and created new institutions and practices. The next section will explore and present a multi-motor theory of institutional change which emphasizing the roles and functions of collection action processes and institutional entrepreneurship in enacting their environment.

2.3 Innovation and Regulatory Debate

Over the past decades, financial industries have gone through some significant changes and shifts, which were attributable to changes in several contextual elements. According to Mention and Torkkeli (2012), such changes included changes in macroeconomic conditions; advancement in information and communication technologies (ICT); digitalization of monetary services; regulation openness; consolidation of bank-insurance conglomerates; large banking mergers and acquisitions, changes in user experience and preference; entrance of new market players; emergence of branchless banking; shift from intermediation business to off-balance sheet activities; and finally globalization and cross-border trade. **The relationship between financial innovation and regulatory compliance requires re-examination in the light of new forms of FinTech firms, implications of the COVID-19 pandemic, geopolitical tension between the US and China, deposit insurance, interest liberalization, private banking**

licensing, internationalization of Renminbi and a series of China's banking reform activities.

In China, regulatory compliance and risk management are prioritized against financial innovation. CBRC's Guidelines refer to financial innovations and risk management as "*two sides of the same coin*" and urge commercial banks to "identify, measure, monitor and control new risks" regularly. The document also requires commercial banks to be legally, administratively and politically compliant in the process of financial innovation. **In the process of financial innovation, China's commercial banks need to comply with the principles of fair competition, intellectual property rights, "know your business", "know your risks", "know your customers" and "know your counter-parties".**

Regulation, de-regulation and re-regulation have been identified as key drivers and hindrances to financial innovation and development. According to Mention and Torkkeli (2012), there had been debates on whether regulation acts as innovation catalyst or is a hampering factor to financial innovation. Miller (1986) claimed that regulation had been one of the main drivers for successful innovation, while Merton (1995, p.471) contended that regulation could hinder the proper function of the innovation engine and consequently constrain the proper functioning of greater efficiencies in the financial system. The following section looks at the nature of financial innovation, the issue in regulatory dialectics, and the interplay between innovation and compliance in the financial industry.

The relationship between financial innovation and regulation is complex. There has been much written about regulation (and taxes) as being an important stimulus to financial innovation. Miller (1986) expounded on this link at some length, and it is easy to find financial products whose origins or consequences can be tied, at least in part, to regulations or taxes. Regulation has been one of the main drivers for successful innovations. For example, bank capital rules have encouraged the creation or adaptation of a variety of off-balance sheet activity, securitization and WMPs. Likewise, financial innovation has also induced new regulations or reform in regulations. The widespread sovereign CDS which led to the 2008 subprime mortgage crisis resulted in the endorsement of DFA.

Not only does regulation provoke certain innovations, but regulators also need to "catch up" with new inventions, in a cat-and-mouse process that Kane (1977) labeled as "regulatory dialectic". Innovators look for opportunities that exploit regulatory gaps; regulators impose new regulations; and each new regulation gives rise to new opportunities for more innovation. Lerner (2006) further developed that regulatory burden may deter young and

inexperienced firms from engaging in the innovation process, due to resources scarcity and, therefore, provide argumentation that such regulatory burden may create innovation barriers. However, Mention and Torkkeli (2012) argued that regulation and de-regulation can induce innovations that provide rooms for newcomers (such as IT firms and MNOs) to explore new financial service models to meet the needs of those un-banked.

Lerner and Tufano (2011) considered the two issues in the current regulatory system. First, many regulatory bodies have mandates that are defined by either product or institution, rather than by function. Suppose that one wants to regulate equity exposures broadly, one would have to coordinate activities between multiple government and market agencies. Second, even a well-staffed, reasonably well-paid and highly talented regulatory agency is up against a world of potential entrepreneurs and innovators. In our view, the product-based or institutional-based approach to supervisory could not meet today's regulatory demands considering the increasingly convergent activities across banking, insurance, securitization, asset management and online banking and the emergence of financial conglomerates such as Ping An Group with banking, insurance and online banking (Lufax) operations under the same organizational control. **A functional-based supervisory framework that cut across product and organization boundaries will help resolve regulatory overlaps and gaps in modern banking operations.** This led to the formation of CBIRC in April 2018 by a merger of China's banking and insurance regulators, namely, CBRC and China Insurance Regulatory Commission (CIRC).

Banks were traditionally subject to a strict control for consumer (investor & depositor) protection and financial stability. **In recent years, with deregulation and financial liberalization (to promote financial innovation), the strict rules governing banking activities were gradually removed and replaced by less stringent requirements.** Kane (1977) introduced the **regulatory dialectic** concept. Basically, financial institutions resort to financial innovations to avoid strict regulations affecting their profitability. In turn, the authorities introduce other rules in response to the financial institutions action, and this "game" is endless. As Kane highlighted, banks always search new modalities to circumvent the regulations that affect their profitability. Therefore, a key-driver of financial innovation is regulation. For example, cross-border financing regulations were relaxed to promote RMB internationalization. Private banking pilot programs were established to help resolve SMEs' financing issues. Opinions and guidelines were developed to promote healthy development of FinTech to encourage financial innovations. However, regulations concerning shadow banking,

capital adequacy and disclosure requirements have been tightened by the regulators to avoid systematic banking risks (CBRC, 2017).

Based on the US experience, **three particularly important sources of innovation are financial deregulation, public policies toward credit markets and broader technological change.** From a consumer protection point of view, a key concern of excessive financial innovation is the surge of complicated financial products that are associated with reduced transparency in the products and an array of choices that are difficult for consumers to evaluate. Evidence shows that a substantial proportion of consumers make poor financial decisions, undertake little comparison of products, are often reluctant to switch products, and rely heavily on product information issued by financial services suppliers (Financial Services Authority (FSA), 2006). Quite like the U.S experience, **financial innovation in China is driven by regulatory support to FinTech development and the emergence of cashless society.** However, Chinese regulators has been concerned about the potential and impacts of systematic risks because of increased globalization of China's economy. Compensation & incentive structures to innovators sometimes can cause problems. For example, some incentive schemes linked originator revenue to loan features and volume rather than the quality of the loan. **Misaligned incentives and product complexity are threats to financial consumer protection. To address these issues, Chinese regulators adopted four lines of defense, namely, (1) increase consumers' financial literacy; (2) enhance disclosure to consumers; (3) exercise direct regulation, including the prohibition of certain practices; and (4) require lenders to set up compensation plans that induce behavior consistent with safety and soundness.**

Most of the regulation reforms toward financial consumer protection are therefore promoting greater transparency and justice on (1) how firms promote their business to customers, and (2) how a financial product is sold, (2a) whether information is forwarded in a clear and transparent manner and (2b) whether a sale should only occur when the customer is satisfied that the product sold is appropriate and (2c) whether the characteristics of the product have been clearly transmitted (FSA, 2006). Inevitably, **regulation will tend to react to innovations, typically with a lag.** From the perspective of systemic risk, this responsive approach may be appropriate, as innovations early in their S-curve adoptions are unlikely to pose economy-wide risks and are probably bought and sold by the more sophisticated set of adopters (Lerner and Tufano, 2011).

Silber (1983) suggested the "*Hypothesis of Restrain inducing innovation*", which regards **financial innovation as "self-defense" behavior** by financial institutions to get rid of or reduce

financial control of government and other foreign organizations. Isik and Hassan (2003) further pointed out that financial innovation with high leverage ratio may intensify various risks more easily. Loose financial supervision may cause excessive financial innovation and sharp increase in market risk. Finally, it is hard to avoid impacts on financial market because of these risks, and the financial system may be unstable. Based on a selected set of data for listed commercial banks in Shanghai and Shenzhen Exchange during the period from 2007 to 2011. Zhu (2013) studied the correlation between innovation capacity and risk supervision index of commercial bank. The result showed **that innovation capability of Chinese commercial bank was negatively related to non-performing loan ratio, and positively related to capital adequacy ratio and loan-to-deposit ratio.** However, liquidity ratio had no obvious effects on innovation capability (Zhu, 2013).

Finally, it is worth noting that, however, financial innovation did not manage to include SMEs, which were almost excluded by the government due to the low profitability, low/no collateral and high risk in SME financing. The situation changed recently with the help of ICT technologies, SME borrowers' behavioral, transactional and credit data generated from e-commerce platforms are analyzed, moderated and evaluated using modern big data analytics technology to ensure that credit processing to SMEs can be performed at substantially low cost and within a quick turnaround time. In addition, regulatory "sandboxes" also allow regulators and practitioners to test financial innovation in a controlled environment before they mature, so that innovative technologies and products can evolve without threatening the existing system. **Finding a right balance between financial innovation and risk control is important to spur innovation yet to contain risk. The specifications of regulatory roles and dialectics will be included in this research.**

2.4 Summary

This chapter reviews the key and relevant literature on innovation and institutional change theories, referring predominately to scientific works published between the 1990s and the 2010s from peer-reviewed journals. The literature shows that financial innovation has become a popular research topic or domain since the US subprime mortgage crisis, which occurred in 2007 , led to the U.S. financial crisis, and eventually affected the far east financial market such as Hong Kong and Tokyo. China's banking system was less impacted due to its closed-door policy but was not fully immune, either.

The empirical results in Section 2.1 explores the peculiarities of innovation in financial services firms and new players, discusses the determinants and success factors of the innovation process, and investigates its impacts. The literature also calls for further understanding of how financial innovation happens, and what the effects at different levels are, including firm-level performance as well as impact on the functioning of other firms and on societies. This leads to changes in institutional arrangements –at both firm and industry levels. Section 2.2 addresses the institutional change theories with empirical results observed and compared to China's banking system reform over the past two decades. This chapter also provides some explanations on the uniqueness and key issues pertaining to financial innovation and its debates with regulatory dialectics. Institutional change is considered the prime theory of this study, while innovation, change and regulatory theories the supplementary or secondary theories. The following methodology chapter will explain the research design and methodology to be applied in this empirical study.

Chapter 3: Research Methods

This chapter generally discusses the methodological considerations and choices that underlie the empirical research process. First, the research design based on a case-study approach is presented. Second, the research setting regarding types of financial organizations, products and participants is attended to. Third, the data collection process based on semi-structured interviews, working seminars, group workshops and review of written materials is addressed. Fourth, data analysis of within-case and cross-case comparisons is explained. Fifth, criteria for evaluating qualitative research are discussed. Sixth, a note on presenting the empirical materials is provided as a guideline to subsequent reading. Finally, a summary of the organizational and management research methodological issues is given.

3.1 Research Design

A research design refers to the choice of how to go about conducting the research. It is much more than a work plan to conduct the research. As pointed out by Yin (2009), a research design is a logical plan to realize the research objectives by defining the research questions and drawing conclusions from their answers. Such process is often realized through data collection and analysis. In short, a research design.

For case studies, five components of a research design are especially important, namely, the study's questions; its propositions, if any; its units of analysis; the logics linking the data to propositions; and the criteria for interpreting the findings. The research questions are to understand "how" and "why" financial innovation occurs in China's banking system, "who" the key institutional actors involved in the change process are, "where" the innovation and change occur, and "what" institutional change model or theory we can generalize from China's experiences. The study propositions as identified in the previous chapter (Literature Review) are the economic system of the country, the structure, size and ownership of the financial institution, which have strong influences on the innovation path selection and institutional change model adopted in China. The units of analysis in this study are China's banking industry and financial institutions (include FinTech) operating in China. Two sets of case study settings were developed and applied on these two units of analysis with the aim to identify different insights from the industry and organizational change processes. Pattern matching, explanation building, time-series analysis, logic models and cross-case synthesis are used in linking the

study data to the study propositions. Finally, analytical analysis, instead of statistical analysis, is used in this study to identify and address rival explanations for the research findings.

Based on the existing debate in the field, the research problem, questions and hypotheses have been identified and explained above. This chapter addresses the objective and research methods, namely, how to go about conducting the research. The section below provides the details of the case study design and approach.

3.1.1 Case Study

According to Yin (2009), the choice of how to conduct the research depends upon three conditions: (1) the type of research question; (2) the control an investigator has over actual behavioral events; and (3) the focus on contemporary as opposed to historical phenomena. Yin (2009) further said, "*case studies are the preferred method when (a) "how" or "why" questions are being posed, (b) the investigator has little control over events, and (c) the focus is on a contemporary phenomenon within a real-life context.*" As this study's objective is to understand how financial innovations are happening in the Chinese financial service institutions and why such innovation process is adopted in a real-life setting, the extended case-method (ECM) (Burawoy, 1991) and case-study approach (Yin, 2009) were adopted. A further clarification of these choices and approaches is as follows.

Case study is a common research method in psychology, sociology, political science, anthropology, social work, business, education, nursing, community planning, economics, management and organizational fields. However, case study is hard to conduct considering its richness and realism of life experience. Yin (2009) defines case study as "*an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident*". In general, the case study method is preferred in examining contemporary events and where the relevant behaviors are not to be manipulated. This seems to apply well to the circumstances of this research, for which a contemporary financial innovation practice is examined in a fast changing and complicated Chinese financial service field. In addition, case study is useful in the early stage of a study on topic about which knowledge is limited, and when current perspectives appear inadequate because they have little empirical substantiation (Eisenhardt, 1989).

Although comprehensive innovation, compliance and change theories exist on various

topics and fields, specific and well-structured theories on financial innovation in relation to regulatory dialectic are lacking. The broad problem approach combined with the emphasis on institutional change do not support experiment as a suitable research method. In this context, a qualitative case-study approach is chosen as it allows for a detailed in-depth investigation of complex issues, namely, the process model and behavior of multiple agents as well as the analysis of multiple sources and types of data (Yin, 2009). This is seen essential in a study focusing on an exclusive and ambiguous concept such as financial innovation. In contrast, quantitative study is more appropriate for studying well-structured problems based on well-developed theories (Yin, 2009).

Preliminary theory

Yin (2009) further emphasized the importance of developing a preliminary theory of the topic in focus as an essential aspect of effective case study design. The researcher should begin with a general theory (grounded or ungrounded in research), and then develop grounded substantive theory of one or more substantive areas. Vaughan (1992) referred to this as theory elaboration. Applying the process of theory elaboration, this study draws on the existing theories, concepts, models, and the author's professional experience in China's financial service field as a starting point. Due to the theoretical background and real cases richness, which does not reflect one single perspective or theory, but builds on and brings together different approaches of the existing literature, interviews and participative observations, the ECM (Burawoy, 1998) is found relevant and useful. ECM uses an iterative process of traveling back and forth between pertinent literature, data and emerging theories. ECM, according to Burawoy (19985), reflexive science is applied to ethnography to capture general rules from individual phenomena on the basis of pre-existing theories so as to better predict the future .

Since this study also aims to establish an entirely new theory by further converging, recomposing and solidifying the present bodies of knowledge on the selected topic, the qualitative approach of Grounded Theory (GT) (Glaser & Strauss, 1967) is adopted for the industry level study purpose. As suggested by Strauss (1987), grounded theory focuses on the development of theory instead of specific research methods or details. It is predominantly a way of doing qualitative analysis using a coding paradigm that ensures conceptual development and density. Generally, GT researchers should make sure that they have no preconceived theoretical ideas before starting the research. Many people think that this means ignoring the literature, which is not true. Instead, the intention is to make sure that researchers are not constrained by literature when coding. GT researchers should make sure that they do not impose concepts on the data. Instead, those concepts should emerge from the data. For this reason, GT is applied by

using literature, data and participative observations to give meaning to current phenomena. Key events are codified to derive concepts or theories. They are also used to explain the process and logics behind the process.

Exploratory, descriptive, and explanatory investigations

According to Yin (2009), there are three fundamental purposes of qualitative case study design, namely, exploratory, descriptive, and explanatory investigations. Exploratory approach is often used to investigate new or under-developed fields in order to identify and understand phenomena and relationships. Descriptive approach is commonly applied to trace and document events over time and the context in which the event takes place (the longitudinal study). Explanatory approach attempts to develop causal explanations in a real-life context. This study applies a combination of these approaches. When the answers to some questions need to be explained, such as "what" and "how" financial innovations happen in a context, an explanatory approach is adopted. When a phenomenon or a chronological order of key events happening in the industry over a period of time needs to be described, a descriptive approach is used. Finally, when the causal relationship of the innovation factors and processes requires explanation, an explanatory approach is applied.

To further triangulate and generalize the research findings, a comparative case study approach can be valuable, particularly related to an exploratory case study because of the increased opportunities to discover interesting themes that lie in multiple comparisons across cases (Yin, 2009). Hence, the selection of case study design represents an important part of the research design.

Multiple case study

Should a single or multiple case study design be adopted? It is a question any study always juggles with. In principle, the research elements and methods in conducting single or multiple case studies are no different (Yin, 2009). A 2x2 matrix is used to show single- and multiple-case studies design with two variants of unitary or multiple units of analysis. According to Yin (2009), there are four types of designs for case study, namely, (Type 1) single-case (holistic) designs, (Type 2) single-case (embedded) designs, (Type 3) multiple-case (holistic) designs, and (Type 4) multiple-case (embedded) designs. The choice of using multiple case studies in this thesis is based on the notion that the evidence from multiple cases is often considered more compelling, and the overall study is therefore regarded more robust (Herriott & Firestone, 1983).

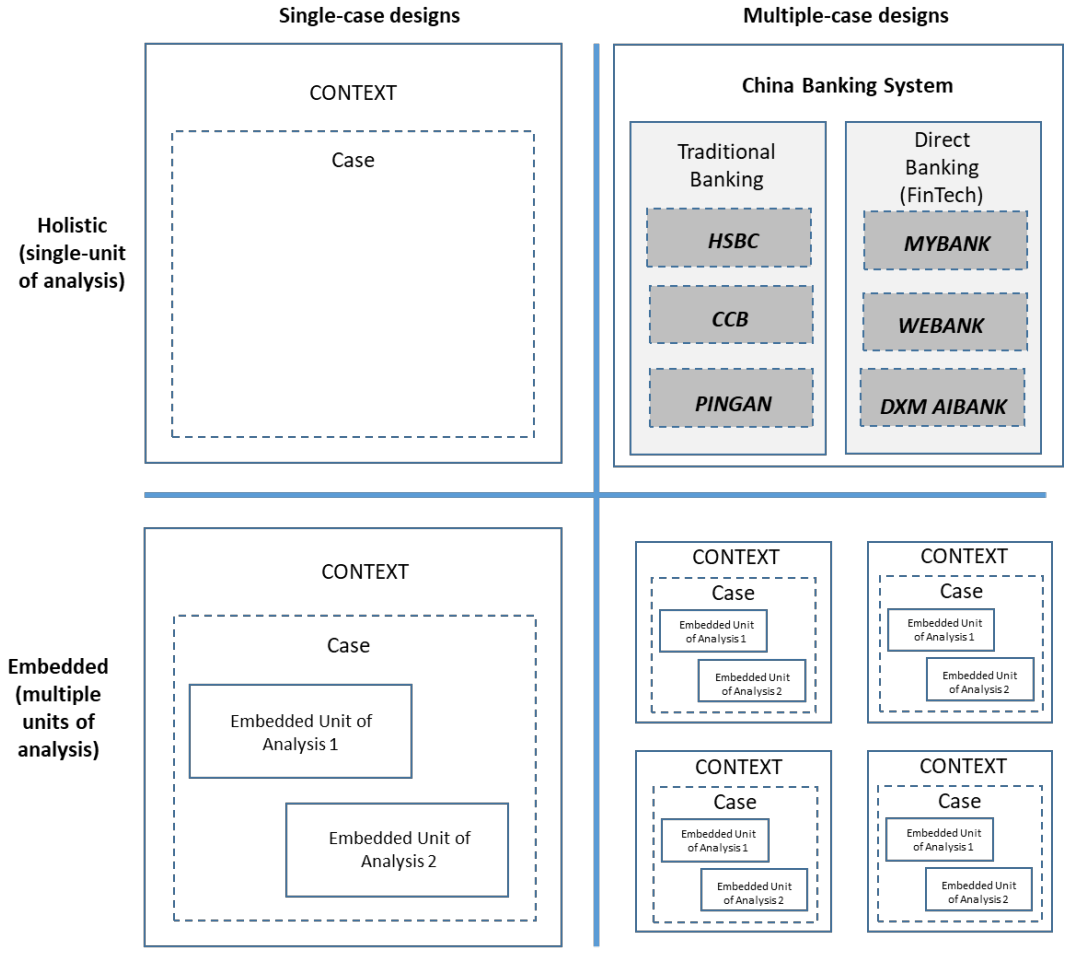

Figure 2-2: Four basic types of design for case study

Source: Adopted from Yin (2009)

From the industry level analysis, considering China's banking system reform over the pass 70 years (1949 to 2019), the author adopts a multiple holistic case design based on descriptive and explanatory approaches over a period. The theory of interest would specify how certain conditions change over time, and the desired time intervals would reflect the anticipated stages at which the changes should reveal themselves.

From the firm level analysis, the study of why and how financial innovations happen in some selected **traditional banks and Direct banks (FinTech firms) in China**, the author adopts a multiple embedded case design based on exploratory and explanatory approach. In this research setting, **a case study applies a firm as the unit of analysis in the institutional change process**. A single unit of analysis with multiple case design provides more comprehensive insights into the complexity and contingency of financial innovation processes in China's banking system.

Hence, a Type 3 of Yin's 2009 multiple holistic case design is applied in this study for firm-level analysis of China's banking system based on two major groups of traditional and direct banking. The conduct of a multiple-case study, nevertheless, requires extensive resources and time from the researcher because of the large scope and difficulties to access to real-life data.

Based on Yin's (2009) multiple-case study method, the initial step in designing a case study is theory development. Identifying a theoretical framework will aid the selection of case(s) to investigate and the definition of the specific measures and steps to apply in the design and process of data collection. Each individual case study consists of a complete real-case analysis, in which convergent evidence is sought regarding the facts and conclusions of the case. For within-case analysis, the conclusion should indicate how and why a particular proposition was demonstrated (or not demonstrated). For cross-cases analysis, the comparison should indicate the extent of the replication logic and why certain cases were predicted to have certain results, whereas other cases, if any, were predicted to have contrasting results.

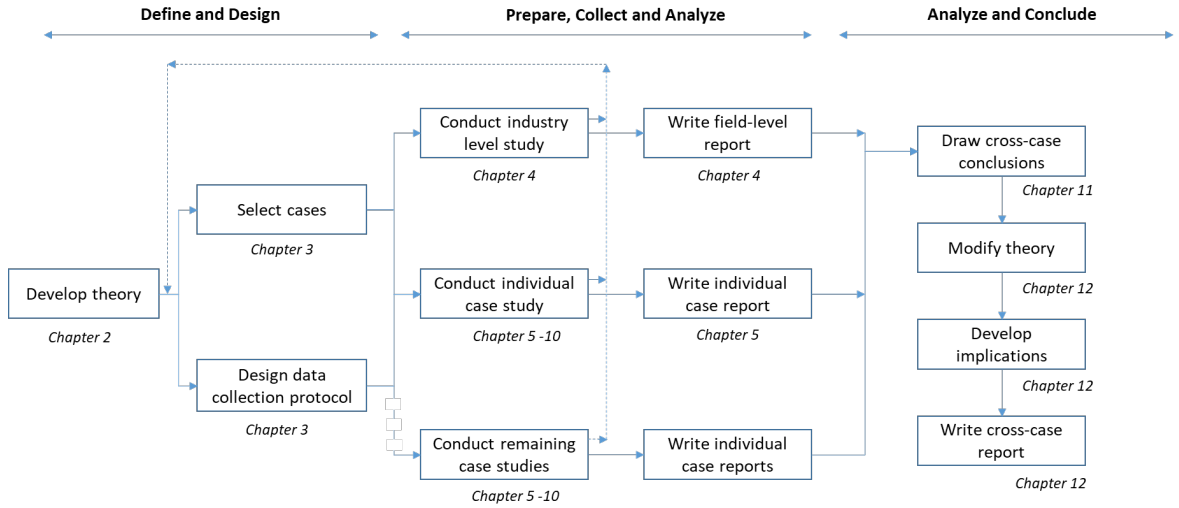

Figure 2-3: Multi-case study method

Source: Adopted from Yin (2009)

It is always beneficial to conduct an early exploratory pilot study to discover the fitting of the theoretical framework, and suitability of the case study design and selection. Such discovery may lead to revision or alternation of the original theoretical propositions. According to Yin (2009) "*Each case must be carefully selected so that it either (a) predicts similar results (a literal replication) or (b) predicts contrasting results but for anticipatable reason (a theoretical replication).*" The case study approach may be "redesigned" to fit the revised research questions.

Such redesign might involve the selection of alternative cases or changes in the case study (such as data collection) protocol. A similar approach is adopted in this study. A detailed elaboration of the pilot study and its results are presented in the subsequent section of this chapter.

Number of cases

Using a multiple-case design raises the question of how many cases is deemed necessary or sufficient in the comparative study. Enough cases has to be evaluated in terms of the research question and with regard to the existing knowledge. Eisenhardt (1989) concluded that there is no ideal number of cases, a number between four and ten cases usually works well. With fewer than four cases, it is often difficult to generate a theory with much complexity, and its empirical grounding is likely to be unconvincing, unless the case has several mini-cases within it. However, with more than ten cases, it quickly becomes difficult to cope with the complexity and volume of the data.

Yin (2009) considered the decision on number of cases a reflection of the number of case replications, both literal and theoretical, to include in the study. It is important to consider the researcher's sense of the importance of rival explanations. Therefore, the replication validity is linked to the number of cases, which is an important aspect of Yin's argument for a gradual extension of cases. Does a new case involve new dimensions, or does it necessitate tightening-up to provide a coherent explanation of conclusion? Hence, case firms are often approached sequentially, so that insights from the first firm can enhance the choice and understanding of the following (Yin, 2009). This approach is applied to the selection of case firms in this study. The choice of conducting comparative case studies is in light of the time frames of this particular study regarded as not compatible with a longitudinal design, except for the industry level analysis.

For the purpose of this study, four cases are selected for industry level study and six cases for organizational study based on a maximum difference approach. This is considered sufficient as the objective of the study is to generalize the research findings analytically, rather than statistically. Besides, it is intended to explore, describe and explain actual real-life experiences based on a pragmatist approach.

While there are many interesting aspects in the case study of change process, process research tends to be very time-consuming, complicated in data collection and difficult to form a pattern in process for explanation. It can easily fall in the trap of what Pettigrew (1990) termed "*data asphyxiation*." The lengthy process of data collection and interpretation in case study will likely limit the number of cases that one can collect and thus limit the generalizability of the

conclusions of process research. In balancing the values and limitation of case study, a total of ten cases are selected in this study.

As a result, a comparative case-study approach is chosen based on the objectivation of the research. Prior to the selection of case firms, a pilot study was conducted to understand the subject matter and evaluate the suitability and quality of the interview questions. The following section explains the findings from the pilot study.

3.1.2 Pilot Study or Exploratory Interview

Purpose

The objective of a pilot study or exploratory interview is to collect some preliminary information from the field about the research topic and subject. The key goals of explorative interviews are (1) to generate a variety of dimensions for the development of an interview guide of the main study; (2) to understand the pilot study environment, people, terminology and key concerns; and (3) to validate the research questions and potential contributions to management. The researcher who conducts the initial field research may simply interview or observe people in the field to learn their responses and suggestions on the research questions and topic. The pilot study is exploratory in nature, and based on qualitative and open-ended interviews which give room for the participants to provide a variety of elements and dimensions for further explanation.

Pilot case study

Why Industrial Bank was selected for exploratory interview? During a conversation with a Senior Researcher from China CITIC Bank, she commented that Industrial Bank is a classic example of innovative financial institution. According to her, "*The President of the bank implemented a good strategy. He knew that Industrial Bank's traditional Deposit, Lending and Intermediary Businesses are non-competitive compared to the Big Four banks. So, he shifted his focus to interbank operations. He built an open platform system for small and medium sized & village commercial banks (SMVCBs), which had a lot of deposits from rural areas but lacked a channel for lending. By setting up this platform, it has access to a large amount of deposits through 200 to 400 outlets in rural areas owned by SMVCBs at a relative low cost. Industrial Bank uses these deposits for interbank lending and entrusted bridging loan.*"

Exploratory interviews

The interviews were conducted with the Legal Director and Operation Director of Industrial Bank's Trust Business Division. The interview was designed in a semi-structured manner to guide the interview process (see Appendix 1). The choice to limit exploratory interviews to Legal and Operation Directors was in accordance with the common approaches in banks to place financial innovation, compliance and change management responsibilities on these two functions. In addition, the choice of interviewees was also based on the notion of trust and access to information. Both the Legal and Operation Directors were senior executives in the Trust Business Division with a long time of service in the industry and a comprehensive understanding of bank innovation and compliance activities. The exploratory interviews, which were conducted separately with each participant, lasted for around two hours each session.

Industrial Bank was established in August 1988 initially as a provincial bank in Fuzhou City, Fujian Province. Later in 2007, it was listed on Shanghai Stock Exchange with total registered capital of more than RMB ten billion and moved its HQ to Shanghai and Beijing. The bank provides the full range of Renminbi banking, investment and trust businesses in China. The Bank's operating philosophy is "Sincere Service, Growing Together" and endeavors to offer comprehensive, top-quality and high-efficient financial service for its clients.

Exploratory interview findings

When asked about regulatory changes affecting the Bank's trust operations, the Legal Director commented that there were several major legislation announcements during the period from 2010 to 2014 in terms of risk supervision, net capital requirements, real-estate investment trust (REIT) and negotiable note trust operations. The Trust Business Division responded to these legislation changes by first analyzing the impacts of regulatory changes to the trust business and investigating if there were opportunities for new businesses. Second, the Bank may leverage on the legislation to accelerate transformation in businesses and operations. Third, the Bank would include the requirements into operation policy and run its business according to regulatory opinions. Generally, the bank obtained the knowledge of regulatory changes from regulatory consultative drafts, Internet and other social media platforms such as WeChat. Upon receipt of consultative drafts from the regulator, the Legal Department was responsible for drafting written responses by analyzing the impacts and providing some suggestions to the regulator. Instead of asking for written responses, the regulator may ask the Legal Department to participate in phone interviews or workshop discussions together with other banks.

The Operation Director added that the Bank would develop change strategies and programs before the implementation of the regulatory changes. For example, the bank would organize

cross-department brainstorming and workshop discussions to develop the change responses and methods. When the new regulation was announced, the Bank would inform relevant departments of the legislative requirements at the regular business meeting. The Innovation Research Department and Trust Operation Management Department would study the changes and innovation methods. The Human Resources Department and Communist Party Department would study the organizational structure change strategies and methods. All these changes and innovations were aimed at improving the Bank's innovation capability and business transformation success.

While talking about the Bank's strategy in response to regulatory changes, the Operation Director said "*The Bank's responses included organizational transformation and business innovation. The benefit of organizational transformation is long-term but can be damaging if it is not implemented correctly. For example, changing the incentive system can improve the Bank's revenue generation capability, but the risks are organizational instability, over-aggressive sales and career boundary distortion. On the other hand, business innovation can improve profitability and asset management capability. However, the downsides are compliance risks and situational uncertainties.*" In short, the Bank would leverage on the regulatory changes to timely innovate new products and transform services and organization to improve competitive advantages. For example, the Bank recently introduced online sales and marketing of unit trust to leverage on the new regulation on online banking activities. The Bank also learned industrially recommended practices in advanced trust operations and leading trust companies' experiences. The Bank also cooperated with other financial institutions to explore new business models and operational methods.

On the topic of the Bank's innovation and transformation during the last four to five years, the Operation Director commented that the Bank underwent several rounds of major organizational transformation, governance structural changes, as well as business model and new product innovations brought by the merger and acquisition and trust business expansion. "*The trust business innovation was brought by changes in the market mechanism. The important factors to the Bank's future development are organization structure and talent acquisition, which enhance the Bank's operation management and business innovation. It is the combination of shareholders' policy, trust business and regulatory changes that drive the Bank to innovate and change.*" said the Operation Director.

As to who initiates the innovation, the Legal Director commented that regarding management innovation, such as human resources, organization structure, investment strategy and corporate governance, the Management team put forward the idea, set targets and

formulated implementation strategies. For product innovation, it was the Marketing department that extracted new thoughts from market interactions, and the Management team selected, invested and promoted such thoughts internally. During the process of organizational transformation and business innovation, it always happened that management boundary was ambiguous or responsibility uncertain. In such cases, the Bank would hold management meetings to decide on the structural adjustments and responsibility clarification.

How is innovation diffused or replicated? Successful innovations and changes are replicated to other businesses, products and service lines. It is based on the speed and expansion scale, practicability of the new measures and financial rents (revenue and profitability) to determine the success of innovation diffusion. When asked about the new innovations and changes in the future, the Legal Director commented that both the Bank and the trust industry were undergoing rapid changes and development. New products, services, organizations and innovation planning and needs were imminent. In general, organizational and process innovations improved the Bank's competitive advantages and were difficult to replicate by competitors. Product and service innovations improved the Bank's market positioning and may lead to industrial and regulatory changes.

When talking about the relationship between financial innovation and regulatory dialectic, the Legal Director commented that the trust firm's new products and service innovations were driving the regulator to enhance the supervisory legislation and operations. In the short term, this may result in stoppage of certain trust business and operations. In the long term, regulatory changes could also improve the firm's risk resilience. "*Financial innovation and Internet Banking provide more consumption and payment options to financial users. There is a threat to traditional banking operations, no doubt! Our Bank is actively planning and responding to these changes. We develop cooperation platforms with partners, such as online unit trust selling, to respond to the "New Internet Thinking*" *paradigm. The industrial collective movement may cause risks to financial customers, public protection and stability of the banking system. In such cases, regulation will introduce new rules to close the gaps. In short, it is always a 'Cat-and-Mouse' game*." said the Operation Director. When asked about the Bank's innovation strategy and philosophy, the Legal Director commented that "*We are operating at the risk threshold where no financial innovation shall violate the laws. All financial innovations shall leverage on existing rules and regulations. Of course, when these are not clear, we always find some new opportunities.*"

Takeaways from exploratory interviews

What are the takeaways from the pilot study? First, the interview participants suggested that the research questions should be clearer and more precise. For example, instead of asking a general question of "*Can you select one of the changes and tell me who had the initial ideas, and then what were the actions of top managers, of branch managers, of experts or other people?*", the researcher was advises to rephrase the question into: "*Can you describe a few financial innovation projects of the firm in the last four to five years? What was your involvement in these projects? Select an interesting innovation project and can you describe the process, from idea initiation to launching of the new product or implementation of the innovation?*" By rephrasing the question, the participants could quickly relate the question to their actual experiences to describe their observations and expres their views on the topic.

Second, the Operation Director explained that not all innovation and changes were successful. Actually, the Bank learned more from unsuccessful financial innovations, organizational changes and business transformations. Given this context, new questions were added in the interview to collect empirical evidence on "successful" and "less successful" innovation projects for the researcher to compare the cases and situation. This would allow the discovery of more meaningful and interesting ideas. For example, "*Can you describe a less successful innovation project? In your opinion, why did it fail? What are the innovation & change barriers? What would you do differently to make it successful?*" Meanwhile, it is important to generalize successful projects and summarize the recommended practices. Therefore, a question was added to ask participants about the general observations on successful projects. For example, *"Do all the innovation activities follow the same process? What are the critical success factors? How are their values assessed, and what was the rollout mechanism?"*

Third, during the pilot study, both the Legal Director and the Operation Director stressed the importance of organization learning and talent acquisition in sustaining innovation capability. Therefore, a new topic about innovation capability development was included in the interview questions. For example, one question asked participants to rate the firm's innovation capability. "*How do you rate the innovation competency of your firm? What are the strengths and weaknesses?*" Besides, some questions were added to understand the innovation capability development process. "*What were done to develop such competencies? What does the firm need to do more to develop or sustain its innovation competency?*"

Forth, innovation capability development was not solely internal. According to the Operation Director, the Bank had cooperation platforms with several partners for the online unit trust selling. Therefore, additional questions on the cooperation mechanism, process, drivers and constraints were included in the formal interview. For example, *"At work, how does*

collaboration with others (inside and outside of the firm) take place in the financial innovation process?" and "*Are there any other factors that facilitate or constrain the firm's innovation competence development? If so, please describe them.*"

Fifth, innovation capability could be developed through routine service delivery (process innovation) or project-based investment initiatives (channel, IT and product innovation). During the exploratory interview, the Legal Director commented that the shareholder investment, incentive system and new thinking from marketing personnel were important factors to cultivate the bank's innovation capability development. Therefore, some additional questions were included in the formal interview. For example, "*Does the firm develop innovation competence as a by-product of service delivery? How? Impact? Example?*" and *"Does the firm make any efforts/investments in innovation competence development? If so, what kind, how, by whom, for whom? What are the firm's incentives to encourage innovation?*"

Sixth, before the interview ended, the Operation Director added that almost all innovations in financial institution depended on the Bank's IT capability to turn ideas into reality. IT created new business opportunities but also brought emerging risks in the digital branchless banking world. As such, the importance of IT as a facilitator or a constraint to financial innovation could not be ignored. Therefore, questions like "*Does IT play a role in innovation process and competence development? If yes, how?*" were added. Finally, no matter how comprehensive the interview questions were designed, there were still chances of missing important constructs in the innovation competency development. Therefore, a final question like "*In the future, what are the most important challenges in terms of innovation competence development, for you and for the firm as a whole?*" was meaningful and should be included in the case study.

Finally, both the Legal and Operation Directors suggested that the selection of business cases for research shall be more diversified to increase the chances for interesting and conflicting observations. The diversification dimension can be by ownership, operation scope and core business/competency. For example, state-owned banks, foreign-owned and private owned banks have diversified ownership. Local, international, provincial and municipal banks have different scopes of operation. Traditional banks and FinTech firms are driven by different core businesses and competencies.

According to Eisenhardt (1989), research cases are chosen for theoretical not statistical reasons. Selecting sample cases from different backgrounds increases the literal and theoretical replications while finding exceptions from cross-case analysis for in-depth analysis. This approach was subsequently adopted in the case selection and research setting below.

In summary, the exploratory interviews confirmed that the questions asked were relevant to the participants and their work. Analyses of the exploratory interviews identified additional questions and notions that are important to the financial innovation and regulatory compliance. Those questions were then rephrased and modified, thereby establishing an interview guide for the main study.

3.2 Case Selection and Research Setting

In financial innovation research, two types of firms served as the basis for empirical settings. The first type is traditional financial service firm which provides banking services (such as deposit and lending, cash management and settlement, forex trading, unit trust, wealth management, investment, financial intermediaries and online banking services) to corporate and retail customers. They are subject to capital reserve requirements and heavy regulatory supervision imposed by domestic legal system. They also comply with monetary policies implemented by the central bank to maintain the healthy development of financial system and economy.

The second type is Internet financial service firm which provides micro-banking services (such as micro-financing, retail deposit, money market mutual funds, mobile payment, money transfer, non-bank check cashing, P2P financing, crowd funding, payday loan and mobile banking) to the unbanked retail customers. These FinTech players include telecommunication operators, Internet service providers, e-commerce and social media firms which have a large base of online users. Only those firms which operate under a banking license need to comply with the central bank's capital reserve requirements.

Regulators are learning the FinTech business models and developing legislation to support financial innovation which contains risks to financial consumers and society. Regulator deems Internet banking a supplement to traditional banks to "fill-in" the micro/SMEs financing gaps (inclusive finance) currently not supported by the bureaucratic structure, credit system and IT platform of traditional banks. There is also a trend for FinTech firms to apply banking license to engage in full-scope traditional banking operations. Therefore, both sides are "competitor" and "cooperator" at the same time.

Due to the scale and the rapid growth of financial services in China, FinTech firms have begun to play a significant role in China's financial system especially for the unbanked community in rural areas and new middle-class financial consumers (Shrader and Duflos, 2014).

Based on the "theoretical sampling" method proposed by Eisenhardt (1989), three traditional banks and three FinTech firms were selected in this study. The criteria for selecting the case firms and participants are discussed in the following sections.

3.2.1 Case Firms

Following an exploratory approach, the selection of case firm adopted a "theoretical sampling" method which was based on information/feedback collected from exploratory interviews (see Section 3.1.2). Applying a "maximum" difference approach in case selection (Yin, 2009), case firms should constitute most differences in respect of the (1) degree of ownership structure and control; (2) degree of branch network coverage in China; (3) and degree of core business, competency and operating model. Based on theoretical sampling (Eisenhardt, 1989), the idea was that variation in case firms would increase the chances of collecting varied empirical data on the selected theme. This would allow discovery of both similarities and dissimilarities among case firms for literal and theoretical implications.

Maximum difference

The selection of case firms was based on a maximizing and a minimizing approach of Yin (2009). First, the firm ownership and control structure influence a bank's performance and ability to invest in financial innovation activities. Ownership structure also affects innovation through resources allocation and budgetary control. For example, Cheng *et al.* (2013) studied the income statements and balance sheets of 94 Chinese commercial banks from 2001 to 2009. Applying regression analysis on 351 bank-year observations of both ownership and accounting data, they found that compared to state-owned banks, foreign-owned commercial banks exhibited higher asset quality, lower credit risk and higher capital adequacy ratio in which efficiency could possibility lead to more funding and stability to fertilize innovation. Their research also indicated that listed status improved the asset quality and capital adequacy ratio of the bank and therefore supported innovation. **Several types of bank ownership, such as state-owned, privately-owned, foreign owned and publicly-owned financial service firms, were selected in this study.**

Second, the banks' scope of operation could also significantly affect the scale size and thus ability to leverage and diffuse innovation. Due to financial innovation and deregulation, banks are growing in size to exploit scale economies in transaction processing and scope economies in cross-selling multiple financial products to each household. Laeven *et al.* (2014) commented

that "*Large banks tend to have lower capital, less-stable funding, more market-based activities, and be more organizationally complex than small banks. This suggests that large banks may have a distinct, possibly more fragile, business model"*. Could large banks be more innovative or conservative than smaller banks? The heated debate on the optimal size, organizational complexity, and range of activities of banks has never stopped. Large banks can benefit from economy of scale, availability of talents and resources to fund innovation, but they are also constrained by their legacy systems and bureaucratic organizational structure. On this basis, **a maximum difference approach was adopted on firm size / total assets, geographical concentration (local, international, provincial or municipal banks), and the number of branch networks in the selection of case firms.**

Third, the emergence of new players such as the Internet, telecom and social media firms in the financial service sector has been changing the competition landscape and innovation process of banking products and services. Some industrial practitioners believe that the future banking will be characterized by customer-centric, digital banking, big data analytics and radical innovation. These FinTech firms play a critical role in inclusive and digital banking. For example, PwC's report entitled "Retail Banking 2020: Evolution or Revolution?" based on a survey of 560 client executives from leading financial institutions across 17 markets found that over half (55%) of senior retail banking executives view non-traditional financial services providers as a threat to traditional banks (PWC, 2014). Again, **the maximum difference approach was applied to select three case firms form the FinTech service industry with different backgrounds, namely, social media, e-commerce and the Internet, as their core businesses.**

Minimum difference

Then, what about the minimum difference approach in the selection of case firms? The minimum approach aims at reducing differences (a baseline for effective benchmarking or comparison across cases), to increase the possibility of establishing a set of conditions under which a phenomenon exists, either to a particular degree or as a type (Glaser & Strauss, 1967). Firm differences were reduced on the criterion that each case firm had obtained a banking license from CBRC and was operating in China. Based on these notions of maximum and minimum differences approach, the following firms were chosen for this study.

Case firm (1) – Hongkong and Shanghai Bank Corporation ("HSBC")

The first case firm is HSBC, a multinational banking and financial services company headquartered in London and Hong Kong. HSBC is listed on both London and Hong Kong

Stock Exchanges and has over 150 years of history operating in Asia and Europe. HSBC brands itself as "The World's Local Bank" with a philosophy of "Think Globally, Act Locally". For example, it pays careful attention to the Chinese financial market development and leverages on regulation drivers and its global technology and innovation platform to continuously develop new and unique banking solutions for the multinational clients operating in China. HSBC's employees are extremely diverse in terms of educational background and expertise. Its clients benefit from its global market networks and strong relationship with the Chinese authorities as a foreign bank. HSBC has more than 160 outlets in China and continues to expand its footprints in Tier Two and Tier Three cities. Globally, HSBC has 8,000 offices in 87 countries.

Case firm (2) – China Construction Bank ("CCB")

CCB is one of the "big four" banks in China. It is a state-owned bank that is listed on both Shanghai and Hong Kong Stock Exchanges. CCB is recognized in the industry as one of the most aggressive banks in terms of financial innovation, professional competence and experience in financing large infrastructure projects. In 2011, CCB was the second largest bank in the world by market capitalization and the 13th largest company in the world. Its organizational structure, management incentive and workforce orientation are very much aligned to the state-own system. Being a state-owned bank, CCB is well connected to the authorities through CPC and SASAC. SASAC represents the investor (the Chinese Government) to supervise operation of all firms invested and controlled by the state. It has 15,000 outlets in China and over 20 branches overseas.

Case firm (3) – Ping An Bank ("Ping An") owned by Ping An Insurance Group

Ping An is a nationwide joint-stock commercial bank headquartered in Shenzhen and listed on Shenzhen Stock Exchange. It was formerly known as Shenzhen Development Bank Co., Ltd. and renamed as Ping An in 2012 after the merger and acquisition by Ping An Insurance Group. Ping An's operation philosophy is "customer-oriented (externally) and people-oriented (internally)". Ping An is one of the most innovative banks in China. Its core businesses are corporate banking, retail banking, interbank trading and investment banking. Meanwhile, it is also aggressively exploring specialization, intensification, integrated finance and FinTech as its new operating strategies, especially in the areas of supply-chain financing, integrated insurance, finance and digital banking. Ping An has about 40,000 employees and provided diversified financial services through its 58 branches and 1,037 outlets across China.

Case firm (4) – MYbank invested by Alibaba Group

In 2015, Alibaba and its affiliate Ant Financial launched MYbank, a 100% online bank in

China. MYbank is backed by RMB four billion (US$646.3 million) in capital by Alibaba Group. It is dedicated to providing inclusive and innovative financial solutions for individuals in both urban and rural areas as well as SMEs, according to its mission statement. For example, it offers small unsecured loans to SMEs operating on Tmall and Taobao (Alibaba's e-commerce platform) with its pioneering "310 model", a business loan that takes less than three minutes to apply for on one's mobile phone and less than one second to approve, and requires zero human intervention. That's because its "cloud-based model", with no physical branches, requires much lower operational costs than the traditional brick-and-mortar banking model. MYbank is also opening up its AI, computing and risk management capabilities to the country's other financial institutions, enabling them to provide more cost-effective financing services to the country's 73 million SMEs.

Case firm (5) – WeBank invested by Tencent Group

Tencent, Baiyeyuan and Liye Group collectively formed WeBank, the first online internet bank in China, on December 2014. WeBank has raised a total capital of RMB three billion, with Tencent as the largest shareholder by holding 30% equity. WeBank provides unsecured loans to consumers with a complete online lending process, from application and approval to the provision of funds. Borrowers are not required to provide collateral or security for credit. Instead, they only need to provide their identification numbers and mobile phone numbers in order to obtain consumer loans between 500 to 200,000 yuan. The product has achieved immense popularity by leveraging the vast user base of Tencent's WeChat and QQ social media and messaging platforms. In August 2015, WeBank officially launched its mobile app and online vehicle finance product.

Case firm (6) – Du Xiaoman Financial and CITIC aiBank (collectively "Baidu Finance") invested by Baidu Group

In 2015, Baidu established a Financial Services Group (FSG) to develop consumer finance, mobile payment and Internet brokerage business. Three years later, in 2018, Baidu spun off its FSG and launched the whole new brand "Du Xiaoman" that operates independently. Baidu Finance obtained its series A financing of USD 1.9 billion. The investment was led by TPG, Carlyle, Taikang Insurance and the Agriculture Bank of China (ABC). Baidu Finance cooperates with the merchants advertising on Baidu search engine to serve their consumers' financial service needs such as travelling, private overseas education, renting, decoration, marriage, as well as financial management, investment and wealth management. Besides, Baidu Finance also cooperating with financial institutions on new FinTech projects, such as open

consumer finance platform, anti-fraud, credit and verification, and asset-backed securitization products. However, Baidu has limited data on individual user profile, since users do not need to log in and complete a user profile for Internet browsing, while they have to do so for shopping on Alibaba or communicating on WeChat.

Case firm and participants' confidentiality

All participants were required to remain anonymous in the study. However, they all agreed that they could learn from each other through the work of this study. Care shall be exercised to avoid the risk of creative solutions leaking to a competitor.

"Theoretical sampling" (Eisenhardt, 1989) and a "Maximum difference "(Yin, 2009) were applied in the selection of case firms regarding (1) ownership structure and degree of control; (2) firm size (total assets), geographical coverage and the number of branches in China; (3) and core business and competency.

Table 3-1: Case banks (traditional banks and FinTech firms)

Comparison	HSBC	CCB	Ping An Bank
Ownership	Foreign bank	State-owned bank	Join-stock bank
Location of headquarter	HK and London	Beijing	Shenzhen
Stock exchange	HK and London	HK and Shanghai	Shenzhen
The year of establishment	1865	1954	1995
Total assets+	2.751	3.140	0.958
Number of branches in China (2019)	160	15,000	1,037
Core business	International and private banking	Deposit and lending banking	Traditional banking and FinTech
Core competency	Global business network	Link with policy maker	Large insurance consumer profile

Comparison	MYbank	WeBank	Du Xiaoman /

			aiBank
Ownership	Ant Finance	Tencent and others	Baidu and others
Location of headquarter	Shanghai	Shenzhen	Beijing
Year of establishment	2015	2014	2015
Market valuation *	22	21	20
Total issued capital *	1.428	1.6	1.9
Core business	Third-party payment and consumer financing	Third-party payment and consumer financing	Consumer financing
Core competency	Large merchant and consumer profile from Alibaba	Large social media user profile from WeChat	Large corporate profile from Baidu search engine

Note: USD/RMB forex = 7 ; * refers to USD Billion in 2019; $^{+}$ refers to USD Trillion in 2019.

The "Ongoing inclusion" approach

Under an "ongoing inclusion" approach, case firms were chosen and approached sequentially, so that insights gained from the first firm could enhance the choice and understanding of the subsequent firms (Yin, 2009). The dashed-line feedback loop in the figure below represents the situation where important discovery occurred during one of the individual case studies. Such a discovery, according to Yin (2009), may require the researcher to reconsider one or more of the study's original theoretical propositions. At this point, "redesign" should take place before proceeding further. Such redesign might involve the selection of alternative cases or changes in the case study (such as data collection) protocol. Without such redesign, the study itself might be subject to serious accusations later on. (Yin, 2009).

In this study, each case firm was carefully selected for a specific purpose within the original scope of study and was chosen based on the researcher's knowledge gained from the previous case firm. This is also consistent with the "***ongoing inclusion***" approach recommended by Glaser and Strauss (1967). The choice of research setting has both a planned and an emergent element. In practice, careful planning of the number and selection of case firms is prominent when working on a doctoral thesis, due to the availability of resources and time constraints. In this study, six case firms were found suitable and manageable within the timeframe of a doctoral program. The inclusion of six diversified share ownership, bank size (geographical coverage)

and core business competence was based on the notion of enhancing the comparability and facilitating a balanced approach in the number of case firms that seemed manageable in this type of study.

3.2.2 Participants

Participants were selected based on the notion of "key participants" who possess the knowledge on the research subject, have involved in innovation and compliance projects before, and have access to data or information required in the study. The key participants in this study undertake roles that presumably make them particularly knowledgeable about the topic under investigation. For example, one participant of HSBC had a long history in the firm and undertook various roles related to sales, customer service and product development. The person played a central role in connecting various departments and locations in NPD. Another key participant had a responsibility for risk, compliance and control in new product conceptual review, regulatory harmonization and final approval. In CCB, one key participant was a member of the HQ NPD team, whereas another played a particular role as the provincial representative and functional coordinator. Both HQ teams and provincial representatives formed a taskforce or project team related to the new cash management solutions development efforts in the bank.

However, key participant research methods in organizational and management studies, like other research techniques, may present potential and inherent participant bias which lead to conclusion errors. Participant bias is a result of the prejudice perception of the key participant on the organizational practice or managerial behavior. The bias might also result from the participant's role (hierarchy) in the organization or memory failure of life cases. A study found that participant data were reliable in relation to issues about the structural variables of an organization, whereas data regarding sentimental or "feelings" variables were not reliable (John & Reve, 1902). This implies that subjective opinions are subject to a higher risk of participant bias when compared to objective organizational attributes. One method to control participant bias is the use of multiple participants from the same organization. Another method is to use external data points or industry experts to confirm the data findings (Golden, 1977). Despite the potential issues in participant bias, many researchers continue to apply the key participant method because it is an effective way to collect organizational data. In this study, the issue of biased information is reduced through use of multiple participants from the same firm on the

same subject and triangulation with multiple sources such as industrial experts from accounting and consulting firms, written policies or memos within the firm, and relevant literature from Chinese journals.

Access to the appropriate participants and willingness of the participants to "frankly" share firm information are often a big challenge to any case study, more so if the research subject itself is sensitive and related to the core competency of the case firm, such as innovation and regulatory compliance. Therefore, the access to appropriate participants was the researcher's personal network of contacts and senior executives of the case firms. The researcher, with many years of consulting experience with large and medium financial service firms in China, provided a way to the organizations and people to help connect with the right participants. Through the relationship or "Guanxi" with the case firms, key participants were introduced to participate in the study based on the criteria described above. Besides, anchoring the study with leaders and influential persons of the case firms was more likely to receive better support from busy participants. In order to keep each participant's information confidential, quotes and descriptions were sorted under labels representing groups of participants such as Bank Manager, Product Development, Sales and Marketing, Business Risk Control Management, Customer Relationship Manager (CRM), Regulation and Risk Management. A summary of the number and demography of participants from each case bank is included in the Appendix.

The approach was using numerous and highly knowledgeable participants who view the focal phenomena from diverse perspectives. These participants include organizational actors from different hierarchical levels, functional areas, groups, and geographies, as well as actors from other relevant organizations and outside observers such as industry analysts (Eisenhardt & Graebner, 2007). The case firms' profile and general information (such as their business environments, strategies and performance) are provided in the opening section of each case study chapter.

3.2.3 Data and Theoretical Saturation

Data saturation refers to the point in the research process when no new information is discovered in data analysis, and this redundancy signals to researchers that data collection may cease. Research saturation, on the other hand, means that a researcher can be reasonably assured that further data collection would yield similar results and serve to confirm emerging themes and conclusions. The claims of saturation should be supported by an explanation of how

saturation is achieved and substantiated by clear evidence of its occurrence. Saturation has attained widespread acceptance as a methodological principle in qualitative research. However, saturation should be operationalized in a way that is consistent with the research question(s) as well as the theoretical positions and analytical framework adopted. Besides, there should be some limit to its scope so as not to risk saturation losing its coherence and potency if its conceptualization and use are stretched too widely. There are four approaches to saturation, which differ in terms of the extent to which an inductive or a deductive logic is adopted, and the relative emphasis on data collection, data analysis, and theorizing, according to Saunders and Kingstone (2018), as indicated in Table 3-2 below.

Table 3-2 Models of saturation and their principal focus in the research process

Saturation model	Description	Principal focus
Theoretical saturation	Relates to the development of theoretical categories; related to grounded theory methodology	Sampling
Inductive thematic saturation	Relates to the emergence of new codes or themes	Analysis
A priori thematic saturation	Relates to the degree to which identified codes or themes are exemplified in the data	Sampling
Data saturation	Relates to the degree to which new data repeat what was expressed in previous data	Data collection

Source: Saunders and Kingstone (2018)

Some authors appear to espouse interpretations of saturation that combine two or more of the models defined above, making its conceptualization less distinct. For example, Goulding (2005) suggested that both data and theory should be saturated within grounded theory. In this study, the author applied "data saturation" in determining whether additional case firms should be added for sampling completeness, and adopted "theoretical saturation" approach to decide whether additional participants should be interviewed to enrich the theories or key themes identified.

Data saturation on case firm sampling is based on the notion of informational redundancy. Besides the initial six case firms identified, additional interviews were conducted with industry experts who were from consultancy firms (such as partners from EY and KPMG Financial Service Advisory), and practitioners from other commercial banks (such as branch managers

from CITIC Bank, Standard and Chartered Bank and Bank of China) and developers from FinTech firms (such as product managers from UnionPay and JD.Com Finance). Information collected from these additional interviews confirmed that no significant new themes emerged. Repetition of responses and consensus across views were expressed that the six case firms represented the key financial innovation process, models and approaches in China. Therefore, it was deemed that the data collection for case firm sampling had saturated.

For theoretical saturation, decision about sufficiency of participant interviews was based on whether there were adequate details, story points or examples in each category to identify the characteristics of concepts or key themes, responses to research questions and ability to develop theories or new insights based on information collected from each interview. Sometimes, the author needs to revisit the participants to collect more information for theoretical construction during the data analysis process. The interview process stops when data collection becomes 'counter-productive', and where the 'new' does not necessarily add anything to the overall story or theory. For theoretical completeness, the author ceased sampling when dimensions and gaps of each category of the key themes and developed theories had been explicated, and the results can be capable, to some degree, of generalization, or conceptually meaningful and practically useful.

3.3 Data Collection

Data collection in a case study follows a formal protocol, but the precise and useful information relevant to the study is not readily predictable. As Eisenhardt (1989) pointed out, data analysis frequently overlaps with data collection, making it hard to build theory from case studies. Therefore, the researcher should frequently review the empirical data collected and continuously ask the question of *"What have I learnt from this?*" and "*What does it mean to the research?*" Where necessary, adjustment to the data collection protocol may be required to allow the researcher to probe into emergent themes or take advantage of special opportunities which may be present in each situation. Section 3.3.1 explains how interview questions are evolved based on the themes and feedback collected from previous interview.

The empirical sources of this study include interviews and written materials. In addition, the researcher used observation during the interviews and onsite visits to further understand what people say and do in the case firms. Interviews, however, represent the main approach to collect data for an empirical study. The semi-structured interview guide was built on the pilot

study or exploratory interviews (see the interview guide in the Appendix I). The empirical sources of the main study are further discussed below.

3.3.1 Interviews and Written Materials

Interviews guide and questions

Interviews were conducted based on an interview guide developed from the pilot study. According to Patton (1990), there are two broad types of interviews: A general interview guide approach and an informal conversational interview. The first approach was adopted in this study. An interview guide with semi-structured questions was prepared to outline the key issues to be explored with each participant and sent to the key participants two weeks before the interview began. There were multiple benefits of using an interview guide. First, participants were more prepared for the interview. Some participants prepared written notes and presented them to the researcher during the interview. Some participants introduced their colleagues in other departments to participate in the interview. Generally, the participants were more willing to talk about the subject they know beforehand. Second, the researcher could always bring the participants back on the issues when the interview went astray. Also, the researcher could check if all key issues had been covered before the interview ended. A sample of the interview guide is included in Appendix 1.

The questions outlined in the interview guide are in the order of an introduction to the study, some warm-up questions with participants, topics related to financial innovation and change management, issues related to regulatory compliance, special topics on innovation competency development and finally free discussion with the participants on emerging topics. The interview might not be taken in any particular order and the actual wording of questions to elicit responses about those issues was reflexive to the interview situation. The interview guide simply served as a basic checklist during the interview to make sure that all relevant topics were covered. In this respect, both the wording and the sequence of questions were adapted to each specific participant in light of the actual interview. The semi-structured and informal conversational interview was more open-ended and flexible. Information could be pursued in whatever direction that seemed appropriate, depending on what emerged from the talk, or was observed, in a setting.

In order to let primary data enlighten the research questions, semi-structured questions were predefined based on the pilot study, the researcher's professional experience and

literatures review. Such interviews had the advantages of both structured (generally easier to analyze and compare) and unstructured approaches (allowing interviewees to explain their responses and provide more in-depth information in their own words and feelings). As the research process progressed, initial questions were compared to responses from each interview, resulting in some questions being refined and downplayed, and new questions added. Therefore, the interview guide gradually evolved in the interviewing process, from semi-structured to more open questions, as themes and dimensions in the data grew clearer.

A conversational approach was dominant towards the end of an interview. A more informal approach allowed the interview to explore new themes and compare empirical data from different sources. Each interview question was built successively on the responses provided by participants. The interactions were expanded, balanced, refined, supported and corrected in a two-way conversation manner. Subsequent interviews were further refined based on previous interview experience. The aim was to seek elucidation and elaboration from various participants (Patton, 1990), to reveal many-facetted themes and dimensions of financial innovation process and regulatory dialectics in real-case experience.

Interviews process

Interviews consist of face-to-face conversations with participants. A small talk before and after the interview is important to establish a relationship of trust, gain honest responses and build rapport for potential follow-up interview. The interview typically begins with a brief introduction of the research project, enabling participants to focus on the topic of the study. Typically, each interview in this study lasted for 60 to 90 minutes. The interview began with general questions with an aim to provide background information and a context for the study. Gradually, the conversation turned to more detailed and specific questions, focusing on financial innovation strategies, process, capabilities, constraints, facilitators and responses to regulatory compliance.

Follow-up questions were asked for further details (for example, *can you elaborate on that? what do you mean by that?*). This approach invited the participants to shape the conversations, allowing their views and feelings to come forward, and enabling the researcher to grasp commonality, variety and individuality in the responses. Leading questions were avoided. For instance, regarding innovation, instead of asking "*is the innovation successful?*", the question was phrased "*what do you think about the innovation result?*" and then, depending on the response, appropriate follow-up questions were formulated.

Some interviews were conducted outside the firm at nearby coffee house over lunch and

after office hours. The participants considered that the bank had strict requirements and censorship on information disclosed to the public. Voice recording was not allowed during the interview. As a result, the researcher needed to take notes during the interview, record interview transcripts and send them to the participant for confirmation right after each interview. Some interviews took place in meeting rooms at the bank. The interviews were conducted individually and/or in group, but all of the participants were involved in the same innovation project. A small workshop discussion was conducted when dealing with more open questions about the bank's innovation capacity development, IT functionality and cross-industry cooperation. Overall, the interviews took place over the span of approximately three years, from July 2016 to June 2019 with intervals in between for long holidays, in iteration with data analysis and literature study.

From speech to transcript

As most of the participants rejected the use of tape recorder during the interviews, short notes were written on a notepad instead. One of the key participants said, "*the use of tape recorder will possibly result in bias and our reluctance to share more insider information.*" In order to encourage the participants to speak more frankly and openly, the researcher agreed to invite a research assistant, where possible, to help take notes during the interview process. The interview transcript was reviewed and edited by the researcher. As noted by Eisenhardt (1989), each interview should be transcribed as soon as possible after completion, so that the conversation, themes and the setting are still fresh in mind. In the process of transcribing an oral interview, the presentation naturally became somewhat more formal. However, emphasis was put on preserving the spoken form. Therefore, the interview transcripts were mainly recorded verbatim, because this was regarded crucial in terms of preserving "raw" data as the point of departure for further analysis (Patton, 1990).

Since most of the interviews were conducted in Chinese, the interview transcripts needed to be translated into English. To avoid possible alteration of meaning, the interviews were not translated word by word. Rather, the researcher and research assistant exchanged notes and made every effort to convey the speaker's real meaning in the translated transcripts. To ensure that the participants' viewpoints were accurately understood by the researcher (Johnson 1997), the interview transcript was returned to each participant for comments. This gave them the possibility to adjust, comment and correct their statements in order to reduce possible slips and misinterpretations by the researcher and/or the research assistant. Some participants returned the transcripts with comments mainly concerning language and grammatical mistakes without changing the overall content of the interview. Some participants deleted some lines in transcripts which they feel uncomfortable to include in written scripts. Some participants

responded by saying something like "*This is fine with me.*" The confirmed interview transcripts were used as raw data for analysis purpose.

Interview concerns

As with all research methods, interviews are subject to individual biases. The question was to what extent participants were able to communicate their opinions and experiences accurately? This required the researcher to define some ambiguous terms such as competence, transformation and learning at the beginning of interview. Besides, the interview quality was largely dependent on what information the participant was willing to share and call to mind in the interview setting. Whether or not information was kept deliberately concealed during interviews was therefore difficult to ascertain. However, comments like "*Please do not include these in your notes*" and "*We are not supposed to give too many comments or express any opinions on the regulation and regulators.*" indicated that this was no major threat to reliability. At the beginning of each interview each participant was assured of confidentiality, and that single quotes could not be traced back to the participant, unless he or she was first asked for permission. Another useful data source employed in this study was written materials

Written materials

Besides interviews, written materials (as secondary data) were also used to get an impression of each firm, including the operating environment, strategy, performance, innovation and achievements. The firms' websites and annual reports (since all case firms were public companies) provided key information about each firm at an early stage. In addition, the firm's internal newsletters also provided information about internal organizational affairs, business achievements and team activities. Further, industry descriptions, professional publications, white papers and regulators' reports also gave important information about the wider context of the overall industry development and trend, such as the competitive environment. Economic reports and government statistics also facilitated collection of more factual and quantitative information about the health of the financial system, new regulations and economic growth. Written materials were used to generate questions in interviews, and also confirmed the information presented by the participants (triangulation).

Supplements to interviews and written materials, observations at workplace can help enhance understanding of real work practices and what people say in interviews. However, observations were not systematically carried out in the entire study. Primarily, they served as backdrop information to enrich the meaning of empirical data collected from the participants. Hence, observations were not specifically highlighted in the presentation of the empirical

analyses.

3.4 Data Analysis

As Eisenhardt (1989) once commented "*Analyzing data is the heart of building theory from case studies, but it is both the most difficult and the least codified part of the process*." Most published studies give a great deal of description to the current literature and the data collection process. Data analysis, generally, is in the form of statistical interpretation or gives little explanation to the process. However, this is the classical idea; but that modern thinking fully allows model building and proves the validity, integrity and reliability of the model built. Model building includes data selection, concept import, concept and data match, and making hypothesis on relations. The study is considered to have high validity with respect to the data; if a model represents 70% of the data, the model is considered good; if the model is only supported by 30% of the data, there is a problem then. "Face validity" is possible if the thesis committee members want to "test" the model's face validity by submitting the final model to some of the participants and other experts and collect their opinions in a rather detailed fashion. Undoubtedly, this will take time and "face validity" also applies to publications.

In this section, the data analysis protocol and process are explained in relation to within-case and cross-cases analyses. Theoretically deduced framework was used to structure the empirical finding presentation, but the analysis was very much an inductive process. During the data collection and analysis process, care was exercised to ensure that the theoretical background was not "enforced" on the data. Rather, the analysis was kept open to "*what the data is saying*" or *"keep to the facts*". In line with the exploratory approach adopted in this study, the inductive analysis took place in the context of discovery, as iteration between "process theory and process data to produce process knowledge" (Orton, 1997).

In most case studies, data collection was conducted concurrently with data analysis. In fact, it was difficult to separate these two processes, particularly in a sequential study like this, in which new themes and understanding of the research topic were built on input from previous to the current, and then to the future participants. The process of analysis could therefore be seen as iterating between data sources and data analyses. This allowed for a reflexive incremental approach and continuous sharpening of the research focus, case selection and data construction throughout the process of theories development (Yin, 2009; Eisenhardt,1989). A challenge to this process, thus, was that it moved constantly back and forth between descriptions

and the interpretation of description, between the complexity of reality and the simplification of complexity (Patton, 1990). Hence, the analysis in this study continuously moved between deductive and inductive modes of theorizing, as well as between data collection and analysis. For example, it was often necessary to go back to participants to collect additional data in constructing the model. The work-in-progress model was shared with participants and theoretical discussion were conducted with a few of participants who are PhD degree holders. The process of moving back and forth between data, model and theoretical framework turned out extremely insightful.

The analysis included multiple sources of data. How did these relate to the analysis? Interviews were constituted by the primary data source. Interview data was particularly important to the analysis of innovation process and content. The written materials, including documents and text analyses, provided supplementary information about the firm and issues described by the participants. Based on a content analysis of written materials (Silverman, 2001), the analysis identified new themes that seemed to be important to the investigation and conformed to the statements and observations obtained from interviews. Written materials were important to the presentation of the company background, its business environment, strategy and performance. This was helpful in terms of analyzing investments in innovation, and with regard to innovation capability development. Observations were made to facilitate a deeper understanding of the innovation work and concerns with regulatory compliance. Contributions from observations were not especially highlighted in the presentation. Rather, they primarily served as a backdrop to enhance the researcher's understanding of the participants' work.

In order to strengthen the reliability of the data analysis, interviews transcripts were compared with written materials, contemporary literature and the researcher's professional experience in a triangulation process. One kind of data was used to illuminate and support another to give meaning. In this way, secondary data and the researcher's rich experience were used to substantiate and expand findings from interviews, and vice versa. This indicated that the three sources of raw data and knowledge were used to build the model. The data sources were not separately jointed, but rather combined in a coherent way to give the proof of its credibility and validity based on triangulation. This was based on the premise that each approach revealed different aspects of empirical "reality" (Patton, 1990). Combining findings from multiple cases and different empirical materials added rigor, breadth and depth to the survey. However, even if interpretations were consistent, there was no guarantee that the inferences were trustworthy, but the threat of invalidity was reduced (Patton, 1990). In line with the design of the study, the analyses of these data sources followed Yin's (2009) approach for

within-case and cross-case analyses.

3.4.1 Within-case Analysis

The objective of within-case analysis is to facilitate a deep understanding of each case firm in order to illustrate the unique characteristics of each case. As pointed out by Eisenhardt (1989), detailed case study write-ups are crucial to within-case analysis. Guided by the research questions, within-case analysis was relatively open and unstructured. The aim was to acquire a general knowledge of what kind of innovation processes and activities were going on in the firm. Why were certain innovation projects more successful than other? What were the firm's strategy and action in a regulated and constrained environment? Each interview transcript was carefully documented and read several times to grasp the view and actual meaning of each individual participant.

Viewpoints were then themed and grouped, looking for patterns of similarities and contrasts, as well as uniqueness, rarity and disruption, as suggested by Patton (1990). The full list of themes was presented in the discussion and conclusion part. The themes were found based on words repetition method, a method that examines people's wording to understand what they are talking about. Word repetitions were analyzed both formally and informally. In the informal mode, the researcher simply read the text and noted words or synonyms frequently used by participants. A more formal analysis of word frequencies was done by generating a list of all the unique words in a text and counting the number of times each occurred with the help of computers.

As the interviews progress, the analysis became more systematic and structured. Based on the research questions and interview transcripts, concepts were developed to organize and group data representing similarities and differences. These elements included innovation process and model; regulatory knowledge, response and dialectic reconciliation; and the institutional change process. Key concepts were then distinguished, categorized and integrated to find new themes and interesting patterns. Finally, a storyline was developed as "analytic thread" that united and integrated the major themes of the study. An example was "Constrained Innovation". This concept was developed to identify possible situations, activities or circumstances in which innovation took place in a constrained environment.

Thereafter, concepts that indicated more firmly certain patterns and directions to pursue were developed. Examples included innovation in "policy constraints", "market constraints",

and “technology constraints”. Innovation in policy and market constraints showed clear patterns in terms of macro-environment and an episodic change tendency, whereas technology constraints were usually organizational limitations and had a pattern of incremental/continuous change. As Poole (2004) pointed out, “*Episodic change is best understood from a macro or global analysis, while continuous change is better discerned through micro level or local analysis*.” Many models of change were proposed in the study. The storyline to synthesize the key themes was then “*when the situation is unfavorable, organization shall wait and find ways to create the positive environment to make a difference. Episodic change could happen when there are major policy change and technology adoption. The inflection point is when the rules of the game change*”.

During the within-case analysis process, sub-themes were further grouped and connected to the main themes. Using the same methodology, “illustrative quotes” were grouped which gave meaning to the storyline. However, the same quote could often be used to illustrate different aspects of the story. This indicated that the theoretical lens/epistemology of different researcher could influence the data analysis in a way that different theoretical scopes allowed for viewing the data in different ways, and could eventually lead to a totally different theme and storyline.

After the within-case analysis, further comparisons were made between the firms based on a cross-case analysis. The logic was very similar to that of the within-case analysis. In light of the research questions, the findings from the within-case analysis were analyzed across the case firms, addressing similarities and differences. This led to a sharpening of the findings, as patterns of similarities and differences grew stronger or became weakened. To facilitate this process, it was important to ensure all within-case study was performed using the same analysis protocol and dimension.

Each case study was presented in a consistent format. First, a brief introduction to the case study bank, its operating environment, business strategy and innovation performance were presented to provide an overview of the subject matter. It was then followed by an in-depth analysis of the bank’s financial innovation process and model, its responses to financial regulatory changes and reconciliation with regulatory dialectics. Next, the financial innovation management, appraisal and competency development processes of the case bank were presented to provide a view on the sustainability of the financial innovation model. At last, a summary of the empirical findings was provided to conclude the key insights or findings from the case study.

Different studies could emphasize different aspects of the data and tap into other dimensions. Similarly, data analysis influences literature readings as findings are compared to theories and professional experience. Thus, a continuous iteration between theory, professional experience and data took place.

3.4.2 Cross-case Analysis

Based on the analyses of interviews transcripts and written materials, initial patterns of how financial innovation took place in each of the case firms were identified. However, the conclusion was premature or even false as individual case could be distorted by information collection and information processing biases. During the data collection process, the researcher exercised his professional knowledge and judgement to evaluate the integrity and validity of the data collected. For example, participants were asked, "*Can you provide an example of situation or real-life case of what you have described?*" The data provided by the participant were also cross-checked with written materials. For example, participants were asked, "*To help me further understand, can you provide any written materials related to what you have explained?*" The data collected from multiple sources were also triangulated. However, distorted data might still exist when cases of innovation failure or comments on government policy or specific regulations were asked for. Most participants were reluctant to talk about their own failure or comment on regulation injustice. In this context, the questions were rephased like, "*If you were given a second chance, what would you do to improve the innovation process?*" or "*If you have a chance, can you give any suggestions to improve the regulatory framework?*" Therefore, cross-case comparison was required to eliminate this tendency by analyzing the data from many divergent ways.

According to Eisenhardt (1989), there are three key tactics to apply in cross-case analysis. The first tactic is to select categories or dimensions, and then to look for within-group similarities and coupled with intergroup differences. The dimensions are developed based on research problem, existing literature and the researcher's intuition. For example, explore vs. exploit innovation, episode vs. continuous change, vertical vs. horizontal collaboration, high vs. low performance, innovation diffusion vs. adoption, and standard vs. tailored product. Some categories, such as performance and product, revealed no clear patterns, but others, such as innovation and change approach as well as collaboration model, led to important patterns of within-group similarities and cross-group differences. An extension of this tactic was to use a

2 x 2 cell to compare several categories at once, or to move to a continuous measurement scale which permits graphing. For example, innovation and change approaches were projected on 2x2 cells, while collaboration model measured on a scale from horizontal, mix to vertical models.

The second tactic was to select comparative pairs of cases and then list the similarities and differences between each pair. This tactic forced the researcher to look for the subtle similarities and differences between cases to identify patterns. As pointed out by Eisenhardt (1989), the process of identifying similarities and differences is a journey towards more sophisticated understanding, which may lead to the discovery of new categories and concepts. For example, through cash pool solutions proposed by HSBC China and CCB for a client, the researcher found that technology innovation differences dominated initial impressions across both banks. However, this paired comparison process led the researcher to see that the speed of innovation implementation process was equally important. A deeper comparative analysis (between HSBC Europe and HSBC China) revealed that "domestic dominance" was another important factor to innovation implementation success.

The third tactic was to divide the data by data source. This tactic exploited the unique insights possible from different types of data collection. However, this tactic was not applied in this study, as the primary data source was interview transcripts. Written materials and observations were used to supplement the understanding from interviews. Therefore, comparison of findings and conclusions drawn from each type of data sources over group of cases may not yield significant further insights, but could possibly consume substantial amount of time and efforts in data separation and cleansing.

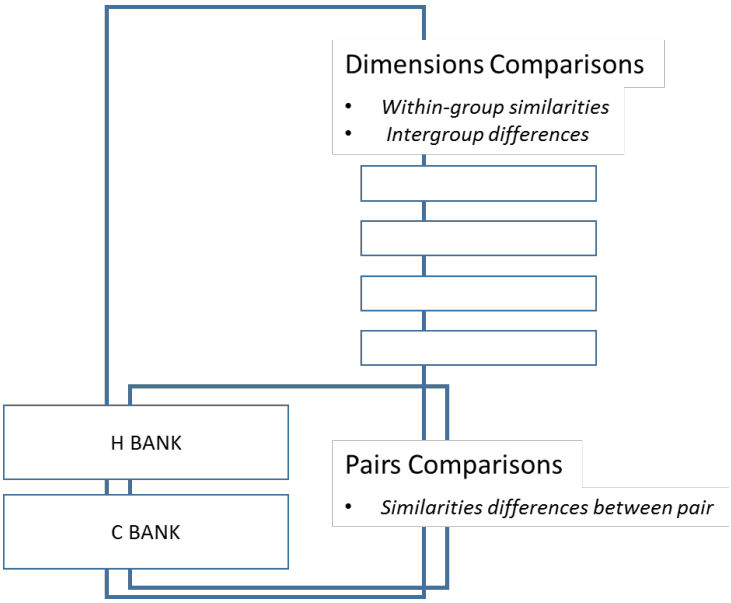

Figure 3- 1 Cross-case analysis structure

Source: Author's analysis

The logic of cross-case analysis was very similar to that of the within-case analysis. Considering the research questions, the findings from the within-case analysis were analyzed across the case firms, addressing similarities and differences. This led to a sharpening of the findings, as patterns of similarities and differences grew stronger or became weakened. In this way, the comparisons could consider the relative strength of the patterns identified. For example, the relationship between financial innovation process and the firm's business strategy emerged as highly important. When the bank's business strategy was conservative and it was more like an "innovation follower", the innovation process was more constrained by risk, control, and governance. In certain circumstances, the firm as risk averse and might exchange "goodies" with regulator for limited innovation implementation in some pilot areas. On the other hand, when the bank was aggressive and it was more like an "innovation leader", the innovation approach was to influence policy openness and "special treatment". In some cases, the firm took risks to test the regulator's tolerance to innovative financial products. This was also true for FinTech firms.

In summary, cross-case analyses allowed the researcher to gain a more in-depth understanding of the data collected, increased the reliability and validity of the data, and enhanced the probability of capturing novel findings from the data (Eisenhardt, 1989).

3.5 Research Reliability

Unlike quantitative research, qualitative research does not encompass concise measurement indicators such as correlation coefficients or F values. The question of how to evaluate the reliability and quality of a qualitative research became an issue. As pointed out in early part of this chapter, this study adopted an exploratory approach, using case study method, to investigate new or under-developed fields in order to identify and understand phenomena and relationships. Some researchers consider this is an approach of "theory building using case studies". According to Eisenhardt (1989), there is no fixed way to assess research. He proposed two additional tests on the "good theory", by assessing the degree of robustness in empirical issues method used and evidence collected. Although the number of cases was limited, the degree of robustness of the findings could be assured because the cases were chosen under the rule of maximum difference, and the theoretical sampling relied upon maximum semantic difference and the degree of "new insight" obtained from the study.

According to Yin (2009), four tests are commonly used to establish the quality of any empirical social research. They are listed below.

- Construct validity which identifies correct operational measures for the concepts being studied
- Internal validity (for explanatory or causal studies only and not for descriptive or exploratory studies) which seeks to establish a causal relationship, whereby certain conditions are believed to lead to other conditions, as distinguished from spurious relationships
- External validity which defines the domain to which a study's findings can be generalized
- Reliability which demonstrates that the operations of a study, such as the data collection procedures, can be repeated, with the same results

Since this study did not aim to establish any causal relationship, the measures to evaluate the research quality were thus construct validity, external validity and reliability.

Construct validity, as the first test, was especially important in case study. There has been ongoing criticism against case studies for failure to develop a sufficiently operational set of measures and "subjective" judgments are used to collect the data. For example, in this study, first it was necessary to define financial innovation in terms of specific concepts (and relate them to the objectives of this study). Second, efforts should be made to identify operational

measures that match these concepts (based on literatures). In order to increase the construct validity in this study, the main concepts and dimensions used to sort data were initially derived from theory. Further, the research questions guided the data collection, and the iteration between data collection, data analysis, research questions, and theoretical reviews made appropriate indicators of concepts gradually clearer. In addition, multiple sources of evidence were collected in a manner that encouraged convergent lines of inquiry, a tactic relevant during data collection. The relationship between the concepts studied and the empirical data seen as indications of the concept was enhanced by relying on multiple participants and multiple sources of data (interviews, documents, and to some extent observations) and including multiple firms. Also, participants commented on and refined their statements from interview transcripts as well as draft analyses. Subsequent discussions between the researcher, participants and industry experts were likely to enhance the validity of the interpretations.

The second test was external validity which deals with the problem of knowing whether a study's findings are generalizable beyond the immediate case. According to Yin (2009), in multiple case studies (as for this study), a theory must be tested through its application in more than one situation to provide strong support for the theory. Analytical generalization, which generalizes a set of results to some broader theory, is the aim. And such generalizability depends on the coherence of the research (Yin, 2009), as well as to what extent a reader finds the craftsmanship and credibility of the researcher reliable (Patton, 1990). For example, a comparative case study of sample firms increases the potential for providing more comprehensive insights into the complexity and variety of financial innovation process than a study of a single firm does. The aim is to provide more credibility to the analytical generalization results. In addition, by specifying the supporting evidence and making the arguments explicit, readers are enabled to judge the soundness of the conclusions made in this study with regard to extending existing theory.

The third test is reliability, of which the objective is to ensure that, if a later investigator follows the same procedures and conducts the same case study all over again, he/she should arrive at the same findings and conclusions. This is an inherent challenge to case study where "*the researcher is the instrument*" as the researcher is actively involved in a process by interpreting the reality in which he simultaneously participates and becomes a product of (Patton, 1990). The interaction between researcher, participants, and data yield changes for all parties involved. Therefore, it is unlikely that two independent researchers will arrive at exactly the same interpretations even if they had the same purpose, focused on the same issues, and used the same method. The point in this study is to enhance reliability by laying the research

open for potential scrutiny, replication, and “testability”, as suggested by Eisenhardt (1989). According to Yin (2009), researchers are advised to make as many steps as operational as possible so that other researchers will be able to perform a reliability check by following the same procedures.

The present thesis has sound research reliability because all steps of the research were precisely defined and followed in actual practice, that data collection methods and data processing methods were the same for all the empirical material, and that the relationships between the literature, models building and confrontation between concepts and data were explicitly described in the present chapter. Beyond this, it is recognized that the different parts of the research protocol had to be developed progressively by an iterative process, a practice that acceptable as long as the final research protocol is applied uniformly to all the data. For example, the “auditability” and “repeatability” in this study were achieved through several efforts, including a clearly stated awareness of the research process, a detailed description and discussion of how the design, setting, data sources, and analysis were considered and conducted in this study, making the interview guide publicly available, avoiding asking leading questions in the interview situation, and by checking own impressions with both participants and other researchers in order to gradually express a greater degree of precision in terms of findings and contributions. In addition, the researcher always aspired to behave candid and honestly throughout the entire research process.

In summary, qualitative research involves many considerations aimed at balancing different elements to achieve high quality. Quality checks were performed throughout the study from design, data collection to data analysis, in order the preserve the authenticity, validity and reliability of its empirical data, findings and conclusions. Further, the quality criteria for research also related to ethical aspects. Therefore, the ethical considerations of concern to this study are addressed below.

3.6 Ethical Considerations

The importance of maintaining integrity and trustworthiness in a study shall never be underestimated. In this regard, a specific section is devoted to discussing the ethical considerations exercised in this study to ensure that the interests of research participants were protected. In addition, upkeeping research ethics in a study is also consistent with the requirements of Paris Dauphine as a PSL research university. Regarding the methodological

issues in this study, the following research ethical guidelines stood out as particularly important: (i) the obligation to obtain consent, (ii) the obligation to inform research subjects, (iii) the confidentiality requirements, and (iv) the obligation to report research results back to subjects. These ethical considerations are discussed below.

First, this study required active participation of participants in interviews where they were expected to provide insights on the research questions and practices of the firm. Hence, consent was obtained from each participant at the outset of the research process. However, participants were free at any time to withhold information when they feel uncomfortable to share or which could probably infringe the firm's "trade secret". The researcher respected the participants' proposition and made notes in the documentation when information was withheld and alternative sources of empirical data needed to be considered.

Second, the participants must be given all the information they needed for a reasonable understanding of the research field, the consequences of participating in the research project, and the objective of the research. For example, at the beginning of each interview, the participants were briefed on the broad overview of the study, its overall aim, methodology, and approach. The participants were provided with sufficient information about the study to direct their thoughts and attention to the topic.

Third, in case study research, confidentially is always a dilemma between new knowledge and participant protection. The participants were ensured that information given during interviews would be treated confidentially and for the purpose of this particular research project only. In order to keep this promise and make the data accessible to other researchers for re-examination, the analysis was based on an extensive use of anonymous quotes. The identification of the participants was concealed.

Finally, participants shared both valuable information and (otherwise billable) time. What did they gain in return? It is difficult to compare what was given and what was received. However, the participants seemed to enjoy the interviews and the informal conversations, and interpreted both from their efforts to thoroughly explain issues. For example, some participants voluntarily reviewed and returned transcripts with comments and further explanations. However, it is acknowledged, and appreciated, that there may be conflicting views and contrasting interests between the researcher and the participants, such as in terms of the framing and the results of the study. The researcher could provide value to the participants and recommendations to the participating firms by providing each participating firm, participant and person with a copy of the thesis.

3.7. Summary

This chapter described how the study was conducted. In accordance with the research questions and existing literature on the topic, a qualitative, exploratory and comparative case-study design was chosen based on an extended case method. Two case firms were selected based on "minimizing" and "maximizing" differences approaches. Data mainly came from interviews, supported by written materials and to some extent observations. The participants represented variety in terms of experience, backgrounds and roles. In addition, a key participant approach was used. The data was analyzed in iteration with theory, using within-case and cross-case analyses. The study was based on an exploratory approach, but also guided by a deductively applied framework. This allowed for flexibility to incorporate emergent issues, while simultaneously being "on track" about research focus. To enhance research quality and credibility, openness was pursued regarding the research process and ethical guidelines are followed. Findings were presented according to each case firm and crosswise.

Chapter 4: China's Banking Reform

China's banking reform started since the establishment of the People's Republic of China (PRC) in 1949. After 70 years of transformation and globalization, China's banking system has become significantly important in the global financial system with the internationalization of Renminbi and the role of Chinese banks in international trade, finance and regional funding such as Asia Infrastructure Investment Bank (AIIB). However, there are limited studies on China's banking reform using an institutional field approach. Most of the literature on China's banking system only describe the nature and timing of reform, confrontations with foreign banking, influences from governments (and CPC), and issues relating to inefficiencies in State-owned banks. Some critical issues still need to be studied. For example, what kinds of institutional arrangements and changes have been evidenced in China's banking system and how is their effectiveness? Why are certain institutional changes more sustainable than others? How are institutional changes initiated, adopted, diffused and collectively acted upon by key players in the industry?

This chapter begins with a synopsis of the institutional change events, actors and implications in China banking reform in the early stage (1949 to 1997) followed by detailed analyses of why and how these institutional changes happened as well as their implications on China's financial innovation and regulatory framework in the modern economy (1998 to 2020). This chapter introduces the contemporary legal framework, institutional innovation initiatives and regulatory dialectic in China's banking system. Some pertinent issues such as FinTech development, shadow banking and open banking in China are also discussed to set the stage for subsequent firm-level case studies in this study.

4.1 Early Stage of China's Banking Reform (1949 to 1997)

Before 2000, China had a centrally planned economy, with most of the socio-economic activities under the plan and control of the new government. The new government ruled out the capital allocation process, including the production plan, labor and product markets. Most commercial activities were in the tight hands of SOEs, which focused on realizing the new government's socio-economic plans. During that period, social equality and benefits prevailed individual wealth maximization.

Between 1949 and 1977, PBOC, which was the only bank in PRC, was responsible for both central banking and commercial banking operations (a mono-bank model). PBOC was an administrative department of MOF, which exercised firm control over all financial services, credit and money supply (Gao, 2012). PBOC essentially combined the roles of the central bank and commercial banks and its operation was subject to strict cash and credit plans set in accordance with the production plans projected by the State Planning Commission (Jiang and Yao, 2017). A few state-owned banks were established during this period without challenging the dominant status of PBOC. These banks passively collected household savings and channeled funds to serve the state's centrally planned production projects. Their operations were driven by government goals and resultant needs rather than profit maximization, and as a result, normal commercial banking functions such as risk management and project selection were largely ignored. During this period, the banking system played only a limited role in promoting economic growth (Yang, 2002).

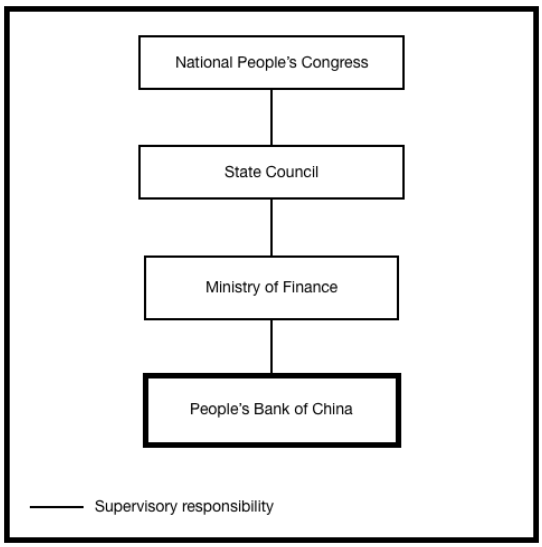

Figure 4- 1 China's mono-bank system (1949-1977)

Source: Author's analysis

The period between 1978 and 1993 was a period of reform from the planned economy to the market economy. The Chinese Government began to recognize the importance of private economy, first as a "complement" to the state sector (1988) and then as an "important component" (1999) of the socialist market economy (Brandt *et al.*,2008). While individual rural credit cooperative institutions, such as Rural Credit Cooperatives (RCCs) and Urban Credit Cooperatives (UCCs), were relatively small, they collectively played a big role in China's rural banking market. RCCs were often more inclined to fund projects with lower risks and higher

capital returns. This exacerbated an existing shortage of institutional lending in rural areas (Guo and Jia, 2008). By 1994, the institutional restructuring of China's banking system was completed. The two-tier banking system took shape, dominated by state-owned specialized banks, along with Joint-Stock Commercial Banks (JSCBs) and a large number of UCCs and RCCs, as well as newly established state-owned policy banks (Jiang and Yao, 2017).

However, banking reform in this period failed to transform the policy-driven banking system into a market-oriented system. Competition was increased but insufficient. The banking system remained as policy-driven, and the role of state-owned specialized banks became rather vague and contradictory. State-owned banks were officially expected to be profit-driven institutions, while banks' operations were frequently intervened by the central and local governments. These banks, as before, were governmental agencies to help implement production plans formulated by the state and regional planning commissions. This policy-driven banking system extended loans to SOEs to fulfill the national and regional production plans and maintain employment, regardless of profitability. About two-thirds of SOEs were loss makers during this period of economic transition, and the banking sector accumulated a huge amount of non-performing loans (NPLs). These NPLs and losses were regarded as the costs of institutional transition of the economy and the state was expected to clean up. Thus, state-owned specialized banks were implicitly guaranteed by the government and enjoyed a soft budget constraint when SOEs were increasingly subject to hardened budget constraints. Commercial banking practices and skills, such as risk management, were hardly developed due to the prevalence of policy lending practice (Jiang and Yao, 2017).

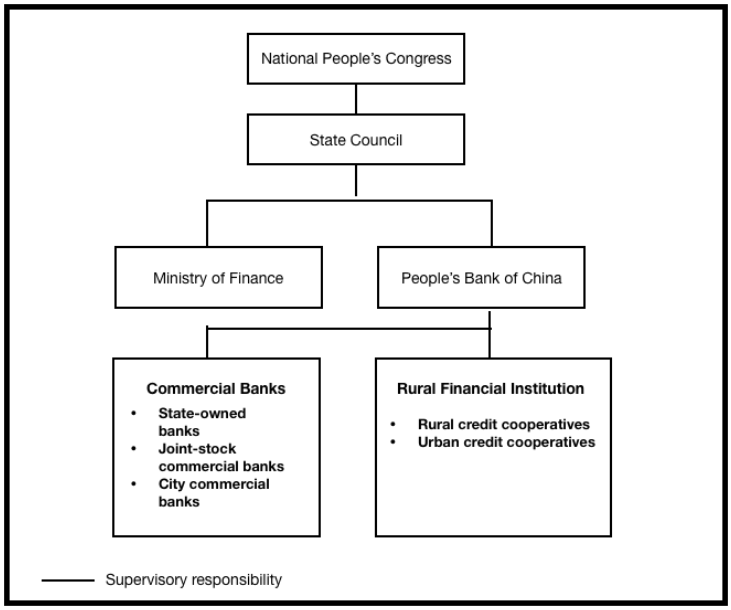

Figure 4- 2 China's two-tiers banking system (1978-1993)

Source: The author's analysis

The period between 1994 and 1997 represented a new era (the Open Door policy era) in China's history known as "socialism with Chinese characteristics" and the "Reform and Opening-up" (改革开放) to the outside world. However, reform was always confronted with resistance. The issues of unproductive and loss making SOEs became serious. By the end of 1994, more than 50% of the approximately 110,000 SOEs in China had been running at a loss. In the same year, direct subsidies to such SOEs amounted to the equivalent of US$ 4.7 billion, or 60% of China's budget deficit. The implementation of the "Open Door policy" had also resulted in an influx of foreign capital into China. In 1994 alone, the contracted foreign investment amounted to US$81 billion, with actual investment for the year reaching US$33.7 billion.

Since 1996, the financial organizational system gradually got improved; SOCBs were transformed into modern financial enterprises through a series of "shareholding reform activities". As a result, over 120 shareholding medium and small-sized commercial banks were set up or reorganized, and securities and insurance financial institutions were further standardized and developed (Allen *et al.*, 2007). To reduce reliance on the central funding model, the government began transforming state-owned "specialized banks" into state-owned "commercial banks" through a series of reforms and commercialization activities. Since the mid-1990s, City Commercial Banks (CCBs) were created by a way of restructuring and consolidating UCCs. CCBs served mainly SMEs and collectives as well as residents within their geographical localities. CCBs adopted a share-holding ownership structure and capital was provided by urban enterprises and local governments. In the meantime, RCCs were restructured into independent financial institutions. The government wanted to completely mitigate the political interference in the banking system, however the reality was that the government intervention and influence were still very strong in the capital allocation process (Li *et al.*, 2013). Because of the lack of a branch network and capital, policy banks had insufficient service and lending capacity and hence were unable to meet the need for policy lending previously provided by the four state-owned specialized banks. Besides, the government had the right to appoint senior managers for the local branches of PBOC (as well as SOCBs). As such, governments had the power to force banks to lend according to their preferences, and government intervention in SOCBs operations was common at that time (Jiang and Yao, 2017). Consequently, SOCBs were often under the pressure from both the central and

regional authorities to make loans to their preferred sectors and enterprises. That led to the deepening of state-owned bank reform in the next stage (Li *et al.*, 2013).

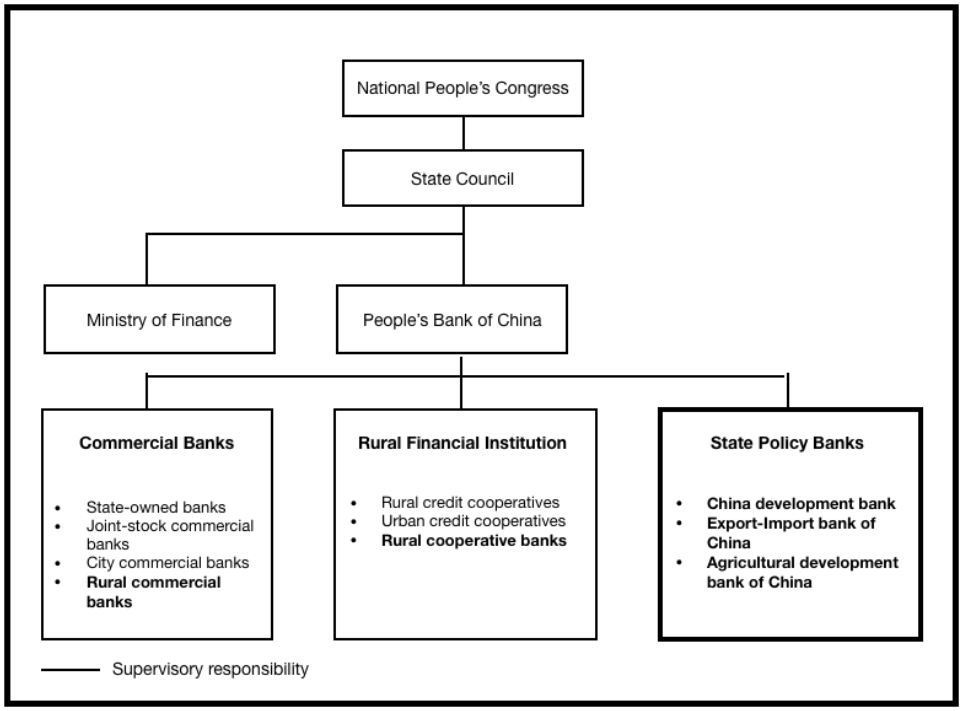

Figure 4-3 China's three-tiers banking system (1994-1997)

Source: The author's analysis

4.2 Modern Stage of China's Banking Reform (1998 to 2020)

Between 1998 and 2002, notwithstanding the economic turmoil (Asian financial crisis 1998) and politics transition (return of HK in 1997 and Macau in 1999) in the late 1990s, China maintained an average growth rate of 9.7% a year over the two decades up until 2000. China's ability to pull through the times of hardship was owed to the state's overall control of the economy by active intervention to stimulate demand through wage increase in the public sector. While foreign direct investment (FDI) worldwide halved in 2000, the flow of capital into the Chinese Mainland rose by 10%. As global firms scrambled to avoid missing the China boom, FDI in China further rose to 22.6% in 2002. Meanwhile, the government was also struggling to modernize and privatize SOEs without inducing massive urban unemployment. The export of Chinese goods increased due to low pricing and improved quality. Meanwhile, domestic consumer spending was boosted, in a large part, due to longer workers' holidays. Along with

the rapid economic development, the revamp of regulations for the stock market and accession to the World Trade Organization (WTO) caused foreign capital to pour into the country (Brandt *et al.*, 2008).

In the late 1990s, it became obvious that political lending was still pervasive, leading to very high proportions of NPLs in big four banks. In fact, most state-owned banks were technically insolvent. As the Asian Financial Crisis developed, the Chinese government advocated a series of additional reforms of state-owned banks to ensure financial safety. In 1998, MOF recapitalized the Big Four banks by issuing USD 32.6 billion of 30-year special government bonds and using the proceeds to enhance the banks' capital adequacy ratios. One year later, China's government established four asset management companies, aiming to take over the bad assets of the Big Four banks and China Development Bank (Gao, 2012).

In 2001, PBOC and CBRC started to take an active role to reduce NPLs proportion and balance by introducing preventive and corrective measures such as five-category assets classification for bank loans, development of a financial regulatory system, reforms of the SOCBs and RCCs (Li *et al.*, 2013). Despite the many reforms made at this stage, banks were still confronted with many problems, especially capital constraints. Bridging the funding gap was a constant challenge and the capital supplemented by MOF was only temporarily sufficient. Despite multiple recapitalizations, banks were quickly becoming, once more, undercapitalized. The culprit, as before, was the high proportion of NPLs, which analysts attributed largely to political interference with the lending process. Perversely, every round of government-led recapitalization led to a banking system even more closely tied to the political class. Clearly, government-led reforms in the banking sector had not been fully successful; government ownership was still leading to political interference in the capital allocation process, despite the various attempts at reform. It soon became clear that, to survive, China's banking sector had to be transformed into a modern banking system. The government had to impose governance reforms, while at the same time protecting the banking sector from the deleterious consequences of political interference and oversight (Gao, 2012).

At the end of 2004, the total assets of foreign financial institutions in China reached over US$47 billion; foreign banks were allowed to handle RMB business in 16 areas, and 62 foreign banks from 19 countries and regions set up 191 business institutions in China, of which 116 were approved to handle RMB business. There were 211 foreign bank branches in China. Meanwhile, China's commercial banks had all set up branches overseas and started an international credit business. Bank of China (BOC) ranked first in the number and scale of

overseas outlets. Financial firms in China will have to upgrade their products to survive in the competition in both domestic and overseas markets (Lu *et al.*, 2005). China's domestic banks needed to be more proactive in devising and implementing strategies to accelerate their product and service innovation process, in particular e-banking products and services. However, lack of regulatory and supervisory procedures for sophisticated financial products, limitations in talent and capability to develop technology infrastructure at a compatible pace with China's financial development needs, and low acceptance of advanced financial products by the conservative Chinese community in general (Zhao *et al.*, 2008) held back financial innovation during this period. China's banking system was not ready yet and simply needed more time.

At this stage, the financial industry was experiencing a "diplomatic tug-of-war" between regulation and innovation. Direct competition and the influx of foreign international banks into the Chinese market required domestic banks to become more innovative and efficient to secure their market shares. As a result, domestic banks started asking for "favorable policy" from the regulators for space and time to compete with the more sophisticated foreign counterparts. The "diplomatic tug-of-war" between domestic and foreign banks also reflected the "dialectics" between regulation and innovation. The regulators, state banks, private banks and foreign banks were confronted with regulatory dialectics in redefining the new banking model that needed to be more risk-resistant and pro-innovation.

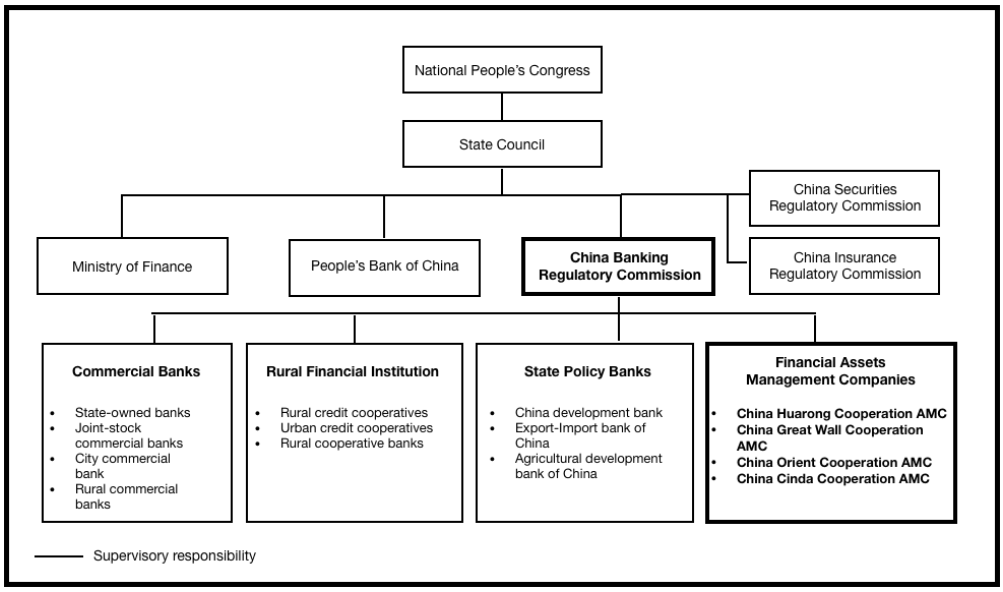

Figure 4-4 China's three-tiers banking and AMC systems (1998-2002)

Source: Author's analysis

Between 2003 and 2007, the high-speed growth and contribution from private sector continued to expand. The GDP growth rates from 2003 to 2005 were at around 10% per year and domestic private sector contribution exceeded 50% of GDP after 2005. In 2008, China became the largest economy in Asia and the second largest worldwide. However, some state monopolies remained in such sectors as petroleum, telecom and banking. The government adopted more egalitarian and populist policies. It increased subsidies and control over the health care sector, halted privatization, and adopted a loose monetary policy, which led to rapid increase in property prices. The privileged state sector continued to receive government investment and low-cost financing, under the "national champions" and "go abroad" policies to compete with foreign large corporations. Incentives were also given to promote high-tech industry and R&D (Brandt *et al.*, 2008).

In terms of banking modernization, to improve the safety, soundness and strength of local banks, at the end of 2003, CBRC stipulated a 20-25% principle whereby an individual foreign bank could hold a maximum of 20% shareholding in the stock of a local bank, and the total holdings of foreign banks in any local bank must not exceed 25%. Based on this regulation, numerous foreign banks acquired shares in local banks. The policy was known as "introducing foreign strategic investors (FSI) to Chinese banks." By the end of 2007, 25 Chinese commercial banks had formed partnerships with 33 foreign institutional investors, with a total foreign investment of US$21.25bn. The government was expecting foreign bank entry policy to yield benefits in terms of capital injections, introduction of management expertise and corporate governance improvement for Chinese banks (Shen *et al.*, 2009). Foreign banks investment in China were primarily motivated by resource seeking and market seeking, specifically, the higher GDP growth of China's large banking market and local resources of Chinese banks, such as distribution networks and local customer base. Chinese banks were motivated to attract foreign strategic investors primarily to seek resources, specifically, getting access to foreign banks' intangible resources, such as advanced management skills, professional techniques on organizational restructuring, IT system design and product development (Li, 2013).

At this point of time, banking governance and governmental interference were still two major unresolved issues. The Big Four banks, whose combined asset accounted for 70 % of China's banking system, remained the top concern and priority in the national economy. Problems generated by NPLs and deteriorating asset quality threatened to impede economic development. Hence, the government decided to further deepen bank reform by focusing on improving the governance of state-owned banks. The process of reform involved four steps:

restructuring, recapitalization, introduction of one or more strategic international investors, and public listing (Gao, 2012).

At this stage, China's financial industry was in the "external-driven innovation process". External factors (public listing, market competition and regulatory reform) pressured China's commercial banks to innovate and operate efficiently in order to survive in China's new economic and regulatory framework. In this stage, foreign banks and capital markets played a key role in modernizing the banking institutional framework in China.

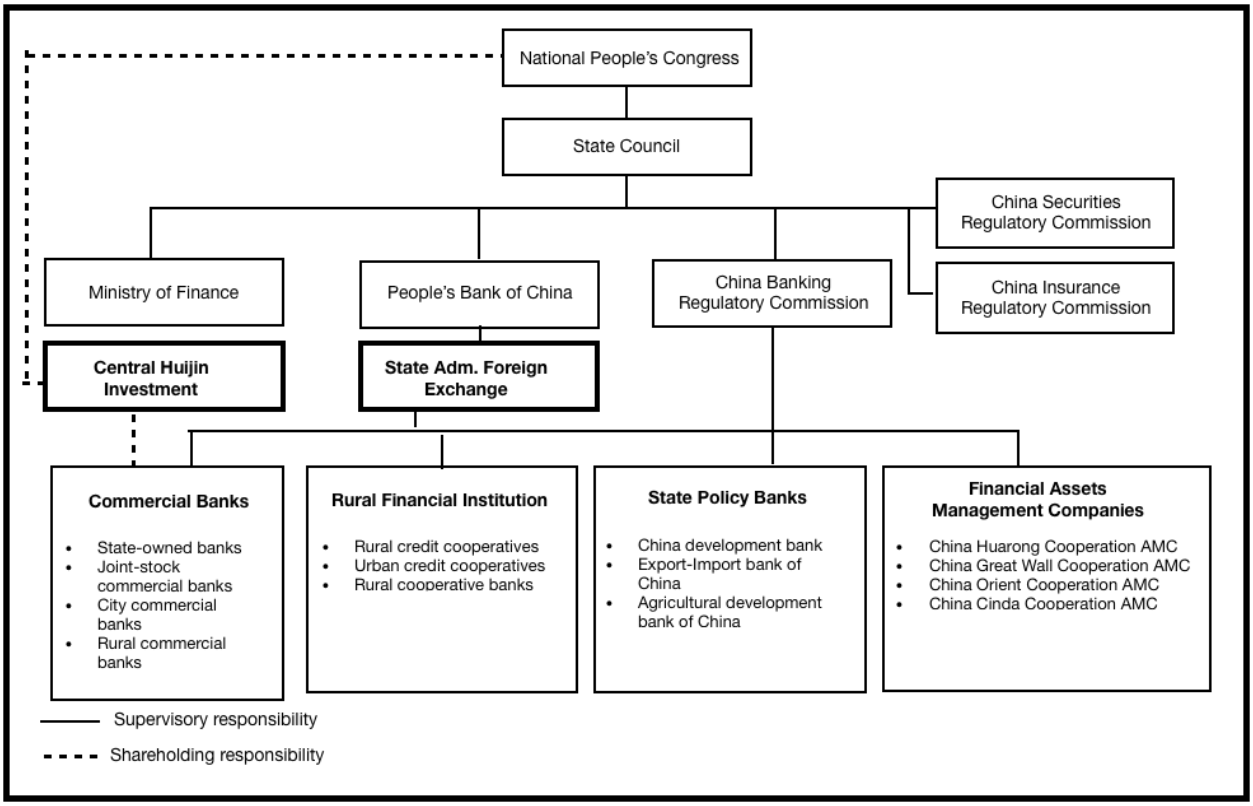

Figure 4-5: China's modern banking system with foreign interest (2003-2007)

Source: Author's analysis

The period between 2008 and 2012 was the stage of endogenous-driven institutional modernization for China's banking system . The 2008 US subprime mortgage crisis led to the widespread collapse of a series of large financial institutions. Investors in Asian countries were suffering significant financial loss following the slowdown of the US and European economy and increase in unemployment rates resulted in a sharp decrease in purchase orders to developing countries such as China. To stop the decline in export orders, in 2008 the Chinese government introduced a four trillion yuan (USD 600 billion) economic stimulus package in the forms of tax incentives and expenditures on public facilities and services. The stimulus

successfully prevented a dramatic fall in GDP growth in 2009 and provided a sustained recovery in 2010, when the real annual GDP growth rate rose to 10.4%. In addition, a series of reforms of regulatory system and economic policies were also introduced to enable the Chinese economy to steadily achieve "soft landing" (cooling down the real-estate overheat in China by introducing housing loan controls) and prevent China's banking system from repeating the mistake (strengthen regulations over financial innovation process).

Most new loans were provided to large SOEs, which then invested money in the real estate market, triggering fears of a new real estate bubble. Another emerging issue was the potential bad loans produced by municipal government financing vehicles. Municipal governments were not allowed to issue bonds or borrow loans from banks, so many of them set up their own financing vehicles to borrow from state-owned banks. Presently, it was estimated that nearly 1/3 of the loans to municipal entities might be at risk of default in the near future (Gao and Fotak, 2010).

As US and Europe economy began to slump, the world economy engine switched to Far East region. Many wholly foreign-owned banks were established in China during the period from 2008 to 2012, mainly attributed to the openness of the financial sector and increasing financing & investment demands in China. By the end of 2011, 181 banks from 45 countries and regions had had presence in China. The profits of China's 181 foreign banks more than doubled, from RMB 7.78 billion in 2010 to RMB 16.73 billion in 2011. Meanwhile, total assets grew by 24% to RMB 2.15 trillion in the same period. This significant growth was achieved because of strong demand for corporate credit from multinationals expanding within China and an increasing number of state and private-owned enterprises customers. Despite China's subdued economic outlook, foreign banks nonetheless predicted an annual revenue growth rate of 20% or more until 2015 (PWC, 2012). The exponential growth in the number of high net worth individuals in China also caused some foreign banks to renew and develop their retail and wealth management businesses. The continuing internationalization of the Renminbi and interest rate reform created currency exchange and arbitrage with treasury management opportunities among Chinese export and import companies (PWC, 2012).

At this stage, the regulators were faced with issues including financial globalization, innovation, mixed-operation, and post-crisis recovery. In 2006, CBRC issued guidelines to encourage and regulate financial innovation by commercial banks. CBRC also issued a series of rules concerning derivatives trading, electronic banking services and financial consultation for individuals. Sixty-two commercial banks were authorized to trade derivatives in China with

total turnover reaching 14 trillion yuan in 2005 (Li *et al.*, 2013). In order to promote financial innovation, the government adopted a tolerant attitude toward risks caused by financial innovations and continuously improved the concerned regulations at the same time. The "endogenous-driven innovation process" required the domestic commercial banks to structurally change, such as setting up innovation departments at both HQ and branches, adopting financial innovation development and approval process, and providing sales support to new financial products. In 2013, the non-interest income of BOC, for example, represented 36.50% of the total operating income, an increase of 6.67% compared to 2012. At this stage, foreign banks and other financial institutions such as trust, leasing and financing companies, collectively played a key role in modernizing China's banking institutional framework.

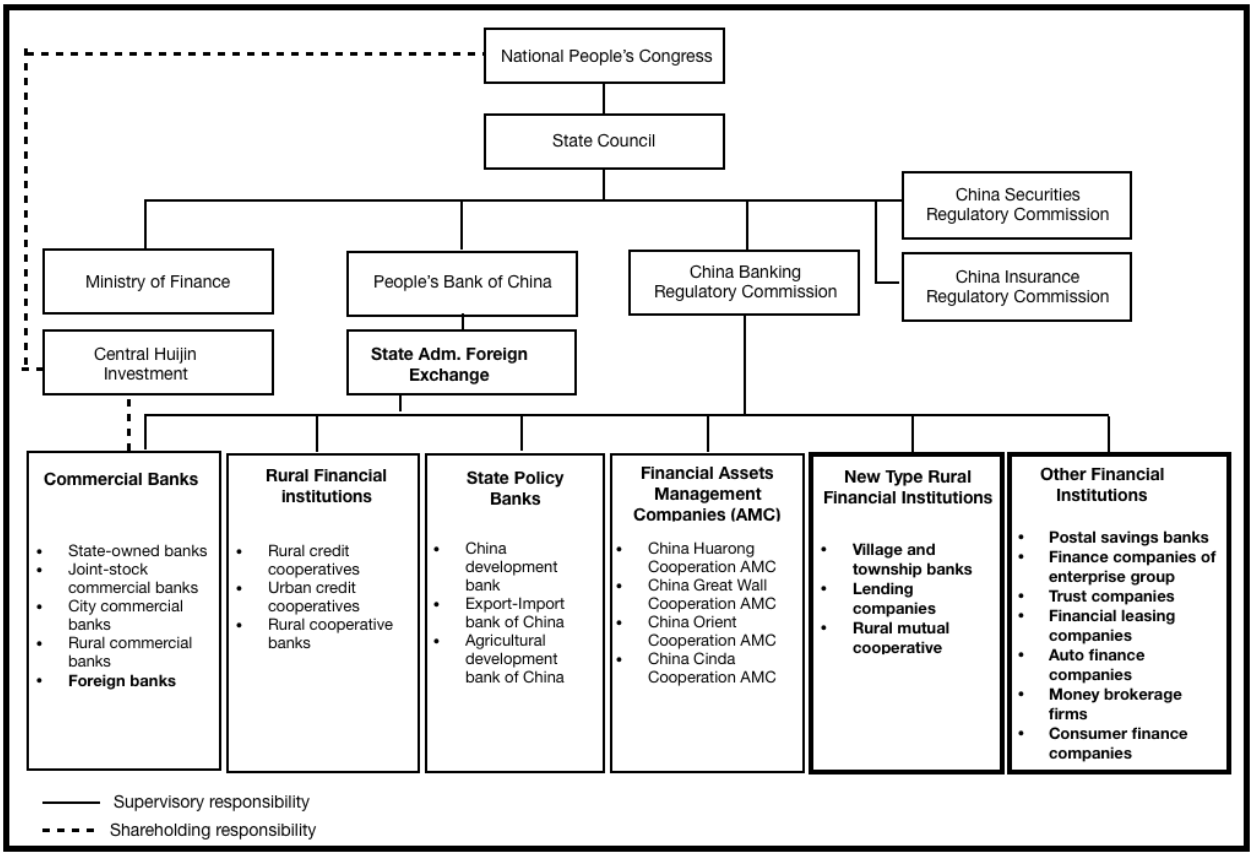

Figure 4-6: China's modern banking system with diversification (2008-2012)

Source: The author's analysis

Between 2013 and 2020, China's banking system was in the stage of institutional integration driven by FinTech and financial system liberalization. During the period from 2005 to 2011, China's banking industry experienced tremendous growth in revenue and profitability, with compound annual growth rate being 20% and 29% respectively. This was resulted from

consistent high net interest margin (2-3%), double digit GDP growth and rapid expansion of bank branches. Proportion of revenue from banking intermediary business increased from 17.5% (2005) to 19.3% (2011). After several rounds of restructuring (capital injection and bad asset separation), the NPL ratio of Chinese banks reduced from 17.8% (2003) to 1% (2011). However, along with the interest rate and Renminbi liberalization pressures, the previous high-growth model of Chinese banks was no longer sustainable. The risk capital requirements and E-commerce popularity in China forced the Chinese banks to look for a new model of online banking growth, rather than capital-intensive physical expansion, to further optimize its revenue structure and profitability (Li *et al.*, 2013).

The Third Plenary Session of the 18th Central Committee of CPC (2013) adopted the Decision on Major Issues Concerning Comprehensively Deepening Reforms (the "Decision"). The Decision covered a wide range of reform issues related to SOEs, the private sector, financial system, fiscal policy, rural land reform and urbanization, market access, foreign investment and environmental regulation. The Session emphasized the importance of the role of market and the role of the government. While placing more emphasis on market forces, the financial reforms included further opening the financial sector both inwardly and outwardly, establishing privately-owned small banks, increasing the prevalence of direct finance, improving Renminbi exchange formation through market forces, accelerating interest rate liberalization and Renminbi capital account liberalization, developing a deposit insurance scheme and improving financial institutions' market exit mechanism (NRI, 2014b). Based on the above, the key to financial system reform proposed by the Session were "liberalization" and "market-orientation".

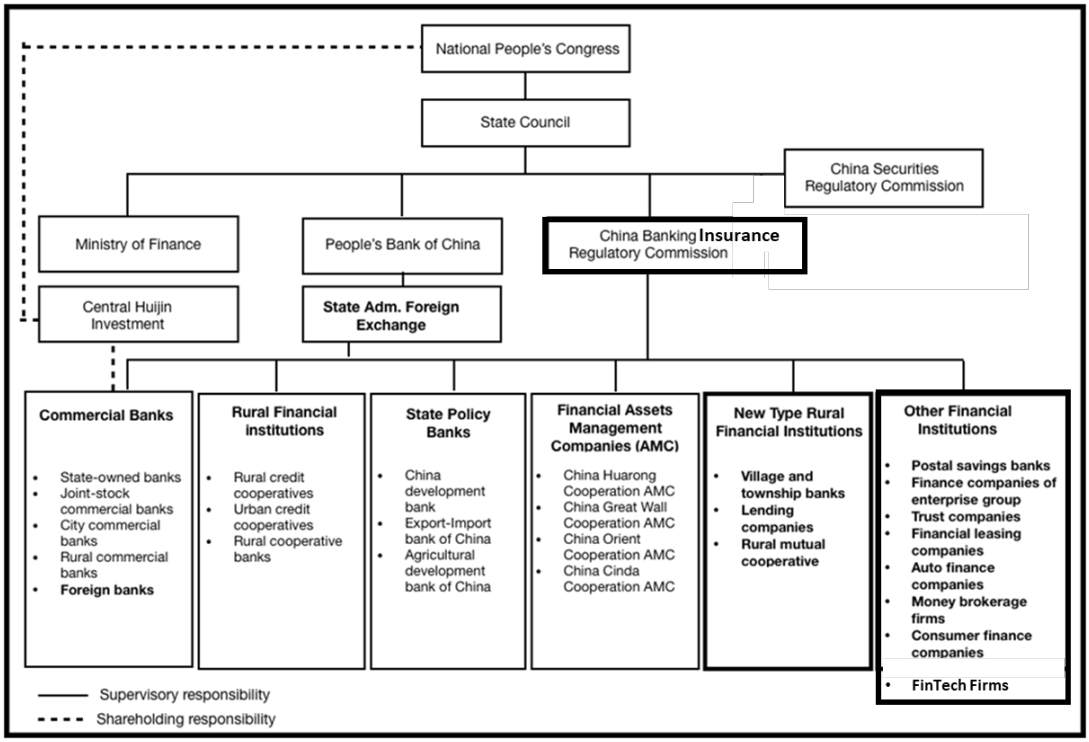

Figure 4-7: China's modern banking system with FinTech and CBIRC (2013-2020)

Table 4-1: CPC Central Committee's Decision on Major Issues Concerning Comprehensively Deepening Reforms

Key points regarding financial market reforms
• Open up the financial sector further both inwardly and outwardly. Authorized establishment of small private-owned banks and other financial institutions that meet certain conditions. Reform policy financial institutions.
• Optimize multi-tier financial market structure. Reform equity issuance registration system. Promote equity finance via multiple channels. Develop and regulate bond markets. Increase the prevalence of direct finance.
• Improve Insurance's economic compensation mechanism. Develop mega-disaster insurance scheme.
• Develop inclusive finance.
• Encourage financial innovations. Diversify financial market strata and products. • Improve Renminbi exchange rate formation mechanism through market force. Accelerate interest rate liberalization. Improve the government bond yield curve to better reflect the market's supply-demand balance.

• Open up capital markets both inwardly and outwardly. Further liberalize cross-border capital and financial transactions.
• Establish and optimize a regulatory system for external debt and capital flows under a macro-prudential regulatory framework. Accelerate Renminbi capital account liberalization.
• Steadily implement financial regulatory reforms and moderation standards. Improve regulatory coordination. Clarify financial regulation and risk mitigation responsibilities between national and sub-national governments.
• Develop deposit insurance scheme. Improve financial institutions' market exit mechanism.

Source: NRI 2014b, based on CPC Central Committee's Decision on Major Issues Concerning Comprehensively Deepening Reforms

4.3 Key FinTech Developments in China

FinTech opened a new line of business and a new source of income to many major Internet companies or traditional financial institutions. Given the large size of the financial industry in China, Internet banking could mean a huge long-term profit base. Major Internet companies such as Alibaba, Tencent and Baidu were at an advantage as they have a large and sticky user-base, high volume traffics, proven service infrastructure, market reputation and innovative/evolving business model. Among financial institutions, Ping An Group (private-owned listed bank) was probably the best positioned to take advantage of the trend, given its early participation in the P2P lending market through its subsidiary Lufax (Credit-suisse, 2014). The following sections will explain the institutional changes in this stage (2013 to 2020) using the case studies of P2P lending, mobile payment and online financial product distribution platform in China.

4.3.1 Peer-to-Peer (P2P) Lending in China

The liquidity crisis and real-estate boom caused the tightening of lending criteria by the banks, which forced small borrowers to turn to alternative channels for credit. Originating in the UK, online P2P lending services refer to the provision of an online platform that enables lenders and borrowers to deal directly with each other, without the need for a middleman (Wang,

2013). Online P2P lending services quickly developed in China. By the end of 2012, more than 200 P2P lending platforms had been established and the balance of loans from online P2P lending services had approached RMB ten billion, with the number of investors exceeding 50,000. Compared with the traditional financial industry, the P2P industry had a smaller base size but an annual growth rate of over 300 %. The P2P lending institutions showed that the number of P2P institutions increased from nine in 2009 to 132 in the first quarter of 2013 and there was a higher concentration in the coastal regions. The transaction volume of the 21 most active ones out of these 132 P2P lending platforms was below RMB 10 million in 2008 but reached RMB 1.03 billion in 2011, and then in 2012, the annual turnover of these 21 platforms reached RMB 10.413 billion. In terms of the lending rate, the annualized nominal interest rate of P2P lending institutions stayed 12%- 22% and 60% of the loans were used as working capital (Chinese Business News , 2013).

Innovation always comes with risk management. Since there was no central credit system in China and credit information was not shared across platforms, default occurred when one user borrowed from multiple platforms. Many P2P platforms had over RMB 1.5 million bad loans. After that, some P2P operators started the model of online borrowing and offline lending to local borrowers. Such a way could ensure a detailed inspection of the borrower, including the usage of fund, source of payback and collateral. Although credit risks reduced, still some four to five large platforms were closed due to some large defaults. In 2013, P2P founders were able to buy the framework on Taobao (e-commerce platform in China). Suddenly, the number of P2P platforms grew from 240 to 600. Online trading volume reached RMB 20 billion, nine times larger compared to 2012. China became the biggest P2P lending market, with 90,000 to 130,000 online investors. From October to December 2013, 74 platforms went bankrupt with owners absconding or restricting investors from withdrawing funds. RMB 300 million was involved, which was three times higher than the total volume of previous defaults. In 2013 alone, over 200 P2P platforms were closed due to massive amount of default (Chinese Business News, 2013).

In the first six months of 2014, P2P loans outstanding at 30 June 2104 totaled RMB 47.7 billion. Some P2P lenders were essentially loan sharks that utilized the Internet to access funding. Some scaled up their operation via telephone sales and started competing with incumbent microfinance companies. Some P2P lenders started to form alliances with microfinance companies using the P2P funding model and lending know-how. This turned P2P platform from “facilitation of micro-financing” into potentially “illegal fund-raising and

shadow banking". P2P lending circumvented the PBOC restrictions on bank lending to finance local government and real estate development projects. Given the large amount of cash flows through the P2P channel, questions started to rise on whether P2P online financing also required banking license to get deposit from public and regulatory authorities' approval to provide principal guarantees to investors (NRI, 2014a). In short, the online financing industry faced the lack of a clear regulatory framework, market entrance requirements and industry operation standards, resulting in an explosive risk to the banking industry and financial stability.

On the positive side, P2P lending had the potential to alleviate SMEs' chronic funding difficulties. SOCBs have to allow the principle of "value preservation and appreciation of state-owned assets", which to some extent forced the Big Four banks to only serve large state-owned companies and provincial government projects. SMEs could not gain enough investments and loans, although they probably had more motivation and capability to create employment opportunities and stimulate economic growth. They had no choice but to turn to the informal financial market (such as P2P lending) for financing at a much higher interest rate. Thus, it was not surprising to see both a high savings rate and a high lending rate for SMEs in that period. The P2P online financing, to a certain extent, also drove the market-led interest rate liberalization process in China (NRI, 2014a).

To curb risk explosion caused by online financing and promote financial innovation in the restructuring of China's economy , on August 23, 2011, CBRC issued the "Notice on Risk Alert of P2P Service", which disclosed the risks existing in the online P2P lending service including the credit risk of the borrower, the risk of illegal fundraising and the risk of money laundering. The above-mentioned legal risks might occur due to the following reasons: (1) **The absence of a clear supervision authority**. In several areas including Wenzhou, Zhejiang Province, supervision had been carried out by the local Financial Service Office, the legitimacy of which had been questioned. (2) The absence of a **clear market access threshold.** The establishment procedures of an online P2P lending company were the same as those of an IT company except that the former has to file a record of its website with the telecoms authority. In other words, no additional qualifications or licensing requirements were required despite the financial services features of online P2P lending companies, and despite the fact that the wider financial services industry in China was heavily regulated. (3) **Lack of legislation**. The lack of governing laws, regulations and industrial guidance caused some P2P lending companies to engage in business operations that threatened financial safety (Wang, 2013).

In PBOC's 2014 China Financial Stability Report (the "CFS" report), fair competition was cited as one of five major principles for regulation of FinTech. Specifically, the CFS report stated that online financial innovation should (1) contribute to the real economy; (2) be consistent with overall requirements of macroeconomic regulation and financial stability; (3) protect consumers' legal interests; (4) preserve a market order of fair competition; and (5) contribute to industry autonomy. In this regard, the regulators were committed to "fairness" as a regulatory principle to both online and offline financial services that were functionally equivalent. There were discussions to set comparable banking regulatory requirements on P2P lending, including market-entry standards such as minimum capital requirements, qualified investor programs, and mandatory reserves against loan losses and other risks, but nothing had been legalized. In term of credit rating, PBOC's Credit Reference Center (CRC)'s subsidiary Shanghai Credit Information Services (SCIS) built a nationwide P2P credit information system, the Net Financial Credit System (NFCS) in 2013 to share credit information of individuals and businesses (NRI, 2014a).

Some e-commerce operators (such as Taobao) were using their customer and transactional big data (transaction, logistics and deposit data within the e-commerce platform) as the core basis for the credit rating scorecard computation. This was proven to be very effective compared to the traditional lending assessment practice. The big data credit scorecard only took a few seconds to complete, while the bank credit evaluation form and supporting documents verification took days, if not weeks, to finish. Therefore, banks were not interested in lending out small sums as the profit-to-time ratio was very low.

Although the P2P industry still had its problems, the innovations and inclusiveness of the industry had a profound significance by bringing "inclusive finance" to this "forgotten financial market". The industry players urged the government to provide some leeway in the policy to promote financial innovation. The credit, technology and market mechanisms developed in the industry could be viewed as an experiment and served as reference for the current financial reform (*Chinese Business News* , 2013). "*It is scientific and logical to sum up experiences, identify problems and develop proper regulatory measures when an industry has grown to an economy of a certain scale*", said Tang Ning, CEO of CreditEase, China's earliest established P2P platform and currently the world's largest P2P institution.

4.3.2 Mobile Payment in China

Along with the rapid development of e-commerce in China, online third-party payment (Mobile Payment) systems also underwent tremendous growth in terms of transaction values, types and service providers. Mobile payment services were offered for not only merchandize or service purchases but also payment for public utility, traffic fines and credit cards. The traditional bank remittance service was to a certain extent adversely affected by the mobile payment (Wang, 2013). By the end of June 2014, mobile payment users had increased to 292 million, of which about 200 million were making mobile payments. According to PBOC, the market size of third-party payment had increased by 60% YoY in 2013 to RMB 16 trillion and mobile Internet payment had of late been the major driver of the growth (Yao, 2014). As of February 2014, there had been a total of 269 licensed third-party payment institutions, 90 of which support mobile payment. Alipay and WeChat Pay took dominating market shares of 48.8% and 19.8%, respectively (Source: iResearch, 2014)

In China, in order to provide mobile payment services, any non-financial companies must apply to PBOC a "Payment Business License". On June 21, 2010, PBOC issued the "Measures for the Administration of Payment Services of Non-Financial Institutions", which stipulated the supervision authority and application procedures for the licensing of mobile payment activities. By December 2013, around 250 companies had already obtained Payment Business Licenses (Wang, 2013).

The rapid technology and business model innovation in mobile payment resulted in the regulatory authorities struggling to keep up with changes. From March 2014 to June 2015, PBOC suspended the rollout by Tencent and Alibaba (two of China's largest e-commerce operators) of online credit cards and code (QR) scanning payments, ostensibly due to concerns about data privacy with these new systems, but perhaps also partly because the authority needed time to understand their impact. To control market, operation and credit risks, CBRC issued guidelines in 2014 which required banks to set payment limits on spending via mobile payment services that were appropriate to customers' risk tolerance levels (Lovells, 2014). In July 2015, the suspension on QR payment was released. Many mobile payment operators, including Alipay and WeChat Pay, rapidly promoted usages of QR payment by offering discounts and cash to consumers, retailers and merchandisers. The result was very successful, and QR payment became the mainstream of mobile payment in China and progressively in Asia (such as, HK, Malaysia, Singapore and India).

Compared to developed economies, new technology adoption was much faster in emerging economies such as China given the limited amount of legacy issues and the inefficiencies of the existing system. For example, one reason why Internet payment systems such as Alipay and WeChat Pay grew much faster in China compared to the developed world was because the alternative form of payment system (such as credit card) was much more established in the developed economies, but less developed in China. One key reason why e-commerce developed so quickly in China was the inefficiency of traditional retailing system to tap the domestic consumer market. Therefore, it was entirely possible that FinTech could develop much faster and become much bigger in China than in the developed world. (Credit-suisse, 2014).

However, the regulators remained cautious about the business risks from FinTech. China's banking regulators had intervened on several occasions to halt some innovative products, including virtual credit cards provided by third-party providers and e-commerce companies. At the end of March 2014, PBOC also announced to cap amounts Chinese can spend using smartphone payment services. Major banks had limited the amount of money consumers could transfer into FinTech accounts, caped them at RMB 5,000 per transaction (RMB 50,000 per month) for Alibaba and WeChat Pay. This was perhaps an attempt of traditional banks to curb massive amount of money being transferred from bank deposit accounts and mobile accounts (WSJ, 2014).

4.3.3 Online Financial Product Distribution in China

During the past two years, the development of financial product distribution was impressive. In June 2013, a financial product called Yu'e Bao (wealth balance) was created as an investment product for settlement funds held by customers in Alipay, a major form of payment in Taobao (one of the largest e-commerce platforms in China). With a T+0 settlement mechanism between Yu'e Bao and Alipay, the settlement account was linked to Tian Hong investment fund account. The annual yield of Yu'e Bao was around 8% to 6% from 2013 to 2015 (and subsequently dropped to below 5% in 2018), which was much higher than the regulated interest rate that was 0.4% to 0.8% for saving or 2% to 4% for short-term deposit accounts. The high yield was enabled by the short-term liquidity needs of commercial banks that pushed up the interbank borrowing rate. The attractive yield rate caused the asset size of Yu'e Bao to grow rapidly from RMB 200 million in mid-2013 to RMB 180 billion by the end of 2013 (Credit-suisse, 2014).

In view of the success of Yu'e Bao, other e-commerce companies joined the competition and started to collaborate with traditional fund companies to launch their own MMF products. The rationale for Internet companies to sell financial products was likely to be: (1) to leverage existing user traffic on their portals as online distribution channels for financial products and provide value-added services that attract users to remain on their online portals; (2) to nurture the usage of their own mobile payment mechanisms and capture more user logins; and (3) to become a cheaper and more efficient distribution channel for financial products that could eventually drive additional revenue from the money market products (Yao, 2014).

Meanwhile, banks were also competing with Internet companies in the distribution of their own MMFs. For example, ICBC and Ping An Bank offered money-market products of their own that yielded more than 6%. China Pacific Insurance sold insurance policies and wealth management products on Tmall to avoid the hefty commissions or banks charge (about 4% of principle). As a result, the digitalization of banking product, assets under management in MMFs skyrocketed to a total of RMB 883bn at the end of 2013, equivalent to 0.85% of the total bank deposits in China (Yao, 2014). It was more economical for foreign banks with commercial banking operations in China to distribute their WMPs via online channel in view of their limited local branch coverage.

The fast growth of MMFs and other products offered via Internet channels raised concerns that bank deposits could eventually be eroded, leading to higher funding costs for banks as depositors move their funds from demand and short-term deposits into other products. MMFs were allowed to invest in short-term financial assets, such as bonds, bank deposits and repos. Even though the deposits remained in the banking system, MMFs raised banks' funding costs substantially. Demand and short-term deposit rates were usually low while rates for Internet-based products were much higher (5%-7% in 2013). FinTech accelerated the process of shifting from bank deposits to MMFs and other WMPs, thus introducing new challenges for monetary policies. For instance, M1 growth slowed to 1.2% in January 2014, the lowest level since data became available in 1997. Demand deposits saw negative year-on-year growth at -4.2%, which had never happened before (Yao, 2014).

The schedule for online WMP stores were delayed several times due to regulatory concerns over risks to the financial consumer protection. According to the "Interim Provisions on the Administration of the Business Operations of Securities Investment Fund Distributors through Third-Party E-Commerce Platforms" issued on March 15, 2013, the regulators required the platform operator to obtain a qualification before engaging in MMFs online business. In

December 2014, Taobao was in the process of applying the qualification from CBRC. Both fund companies and consumers were optimistic about opening of fund stores on Taobao, which were deemed to be able to greatly facilitate purchase procedures and expected to enjoy great popularity (Wang, 2013). In early 2015, the online MMFs mart was officially launched, and traditional banks also sold their WMPs on this MMFs mart.

4.3.4 FinTech Impacts on Regulation and Innovation

The rapid development of FinTech was driven by the following two factors. Firstly, the ***inefficiency of incumbent financial services*** made substantial room for FinTech. For example, third-party payment companies provided tailored solutions to certain industries and significantly enhanced the convenience of shopping and payment for the public. Traditional banking operation, with heavy administration bureaucracy and regulative controls over product / service innovation, was incapable of meeting consumers' evolving needs and changes in buying behavior. Likewise, P2P fulfilled the borrowing demands of consumers with incomplete credit information and of small enterprises, which had not been fully served by traditional financial institutions. Secondly, the regulator had a more accommodative attitude towards FinTech. As FinTech had to some extent helped enhance financial intermediation, regulators were more accommodative to its development. However, this raised concerns about ***"regulatory arbitrage"***, or how to maintain regulatory consistency between FinTech companies and existing financial institutions. For instance, regulators set strict controls over investment thresholds on mutual funds, wealth management and trust products offered to public by traditional banks. However, Internet players did not require compliance with such requirements, especially in connection with certain high-return products with corresponding high risks (such as Yu'e Bao) (Yao, 2014).

In association with the rapid development in FinTech, several major issues in financial regulation and innovations became obvious.

(1) FinTech led to the issues of ***ambiguous legal status and business boundaries***. For instance, P2P lending platforms were engaging in a type of business that was difficult to define in the legislation or to effectively regulate. This often caused business activities of FinTech enterprises to go beyond regulatory boundaries and enter into a gray zone of law, sometimes all the way into illegal activities, such as money laundering and illegal

funds rising. Internet financial regulation in China was very much lagging behind innovation (Yao, 2014).

(2) **Insufficient risk control might lead to operational risks**. Some FinTech enterprises adopted a controversial high-risk transaction model for the sole purpose of expanding their business and increasing profitability. These enterprises failed to establish such mechanisms as customer identification, transaction recordkeeping and analysis, and reporting of suspicious transactions (Know Your Customers (KYC requirements). Some Internet enterprises neither practiced sound internal management nor provided adequate protection of information security, which resulted in potential risks of customer information leakage, funds embezzlement and investment losses (Yao, 2014).

(3) ***Limited mandatory information disclosure to public and regulators***. Some WMPs distributed via Internet were sold with misleading or inadequate information disclosure to the consumer. In addition, currently the regulator did not impose mandatory stress-test, capital reserve adequacy and mandatory risk disclosures requirements on FinTech companies. As a result, there were risks associated with market discipline, liquidity and operations of FinTech companies (Yao, 2014).

What actions were taken by the Chinese authorities? The Chinese regulatory authorities took an active attitude towards the development of online finance. On August 1, 2013, an "FinTech Development and Supervision Research Team" composed of officials from seven ministries went to Shanghai and Hangzhou to conduct a study on the development and innovation models of FinTech. In its "Implementation Report of the Monetary Policy of the Second Quarter", PBOC defined FinTech as "an emerging industry which combines traditional financial services and the Internet". It pointed out that online finance boasts high transparency, wide participation, low intermediary costs, convenient payment solutions, an affluent credit database and a higher efficiency of information handling. As a new financial model, FinTech put forward higher requirements on financial supervision, financial consumer protection and macroeconomic control. The relevant new regulations would be drafted and promulgated to lead the Internet financial industry to grow healthily (Wang, 2013).

FinTech threatened the dominant position of the traditional financial service players in the market, especially banks, which were at the risk of becoming less innovative due to the increasing regulatory obligations and mounting costs. Banks in China were keeping a close eye on the development of Internet financial services provided by the internet companies, but most of them remained unconcerned about the increased competition from these new players in the short and medium term. Retail banking generated only a small portion of revenue in the

traditional banking portfolio, and not all retail banking functions could be substituted by FinTech. Nevertheless, banks were motivated to develop their online banking services, such as online lending platforms, payment via internet or mobile phone and the provision of other banking services through mobile banking in order to keep their market shares (Wang, 2013).

On the other hand, banks started to cooperate with internet companies. It was reported that China Minsheng Bank had been collaborating with Alibaba Group to provide financial services, such as offering WMPs, credit card operations, and electronic banking. More and more collaborations between traditional financial institutions and internet companies were expected to be seen (Wang, 2013).

4.4 Financial Liberalization and Its Impacts

4.4.1 Liberalization of Bank Interest Rate

China's market-led interest rate liberalization progress was accelerated by recent financial dis-intermediation, mobility banking and technological development. According to PBOC, China's interest rate liberalization should start from long-maturity and large-size deposits and gradually move to short-term small retail deposits. However, MMF like Yu'e Bao effectively offered free market interest rate to depositors of short duration on a very small scale, and this could accelerate interest rate deregulation in short-term deposits for small depositors (Credit-suisse, 2014). On November 21, 2014, PBOC lowered the benchmark deposit rate to 2.75% from 3% and the largely symbolic lending rate from 6% to 5.6%. Bundled into the announcement was another step toward interest rate liberalization, with the maximum deposit rate raised to 1.2 times of the benchmark, compared with 1.1 times previously. China cut interest rates for the first time in more than two years, a powerful signal that the government wanted to step up support for the slowing economy. It emphasized the need to reduce corporate financing costs to help struggling companies, especially SMEs. It was also an important step on the path towards interest rate liberalization in China. Previously, banks were allowed to set deposit rates 10% above the benchmark level; that was raised to 20%. Lending rates had already been liberalized, with no floor on them (*The Economist*, 2014).

4.4.2 Internationalization of Renminbi (RMB)

International use of RMB was an important element of China's reform strategy. The goal of RMB limited liberalization was to increase the usage of RMB in international transactions. The government had not prepared for full reserve-currency status and free convertibility of RMB. By December 2104, China had set up offshore RMB centers in Hong Kong, Singapore, Taipei, London, Frankfurt, Paris, and Luxembourg. Offshore investors had been keen to invest in RMB for its continued appreciation since 1994 given China's strong economy growth, high foreign reserve and relatively low inflation. However, it cannot become a true international currency until Chinese authorities drop the strict limits that remain on capital flows (that is, transactions in financial assets) between China and the rest of the world (Gagnon and Troutman, 2014).

To further liberalize the economy, Shanghai Free Trade Zone (SFTZ) was launched in September 2013 as a testing ground for a number of economic and social reforms. As a sign of RMB liberalization, SAFE announced that companies incorporated in SFTZ would be permitted to Renminbi convertibility and unrestricted foreign currency exchange. The liberalization of RMB led to development of offshore RMB (CNH) market, in the forms of offshore investments like bank deposits, CDs, dim sum bonds, bond investment funds, RMB equities and A-share ETFs. As of March 2014, total offshore CNH deposits amounted to RMB 1,455 billion ($234 billion) and offshore CNH bonds reached RMB 419 billion ($67 billion).

What were the potential implications from RMB liberalization ? First, as RMB came to be used more widely in trade settlements and as a vehicle for cross-border financial flows, it would become logical for China to play a bigger role in International Monetary Fund (IMF) in terms of decision making, drawing rights (SDR) and RMB credit to its members. Second, as RMB became a global reserve currency, there were worries on potential instability of exchange rate. Investors, including central banks, could be prone to shifting the composition of their reserve portfolios in response to events, rendering the exchange rates between the major currencies more volatile. Third, the continued liberalization of RMB will hasten the regionalization of the international monetary system. This would happen if RMB came to be widely used for international transactions in Asia, while the role of the US dollar diminished in the region, leading to the dollar and RMB sharing the international currency role (Eichengreen and Kawai, 2014).

4.4.3 Liberalization of Financial Market and Access

A growing division between online banking (offered by banks) and FinTech (offered by Technology firms) had begun to take shape. Jack Ma, founder of Alibaba, argued that the Chinese financial industry was over-regulated. He regarded online banking and FinTech as the two big opportunities in the future financial industry and believed that spoilers were needed to revolutionize the industry (Guo 2013).

The interoperating of multi-players in the new branchless banking ecosystem

Unlike Africa, which was dominated by large mobile network operators (MNOs), China's financial service provider liberalization was driven by a convergence of forces coming from banks and financial institutions, as well as innovative technology companies and internet giants providing payment (Lakala), search engine (Baidu), e-commerce (Alibaba), and social networks (Tencent). As a result of rapid adoption of mobile Internet technology, solid payment infrastructure and a vibrant e-commerce industry, China was moving rapidly toward a tipping point for branchless banking uptake. At the core of this pathway, the ecosystem for interoperability, digital payments and e-banking in China grew to encompass a wide range and number of players, including banks, MNOs and third-party payment providers, with a number of key institutions such as China Union Pay (CUP) and credit bureaus that enabled the ecosystem, linking closely with regulators (PBOC, CBRC) (Shrader and Duflos, 2014).

In much of the developing world, MNOs (Telecom Operators) were playing a critical role in driving financial services to low-income clients through mobile money, allowing people to store and transfer small amounts in their mobile wallets, cashing in and out through large agent networks inexpensively and in real time. But despite the scale of China's MNOs, operators struggled to establish a relevant role in providing financial service. For example, many African operators had established around mobile money. Most players believed that the predominance of bank accounts degraded wallet utility. Regulatory limitations were also a factor, with recent regulation limiting total transactions on a mobile wallet per year to 1,000 RMB (approximately $160) (Faz and Mozer 2013).

Third-party payment providers were a source of major innovation in the payment space in China, with the number of third-party payment licenses reaching 223 in 2012. Third-party payment enterprises in China showed two main kinds of development models. While Alipay and WeChat Pay focused largely on the needs of individual users in business development and

product innovation, other third-party payment parties, including 99Bill, ChinaPnR, YeePay, and iPS, regarded corporate users as the focus of business development, providing integrated solutions to enterprises so as to meet their requirements. Social media also began to play major growth roles in mobile payments. WeChat, China's most popular instant-messaging service, developed by Tencent, added a mobile payment service on its platform in August 2013, and Baidu, China's leading search engine, followed by introducing its own mobile payment service known as Baidu Wallet SDK.

Central to the financial interoperability and access was CUP, which was responsible for linking ATMs and electronic funds transfer at POS throughout the Chinese Mainland; and to set standards for interbank clearance, digital payments and funds transfers. For example, CUP launched a broad range of innovative payment pilot programs designed to increase financial inclusion, including the agent banking pilots in rural China. IT infrastructure, including payment associations, credit bureaus, and interoperable automated teller machines and point-of-sale (POS) switching through China Union Pay, also helped pave the way for increased access to financial services by establishing common industry standards promoting product innovation, improving transparency, and building a greater number of client service points (Shrader and Duflos, 2014).

A range of coordination bodies, including the Mobile Payments Industry Alliance (the "Alliance"), which was founded by CUP in 2010, were also launched in recent years to drive clarity and standards in the market for branchless banking. Alliance was a platform through which banks and wireless operators could jointly offer mobile payment services to firms in various industries. Members included 18 national and local commercial banks; two mobile communication operators; mobile phone manufactures, such as Nokia and Lenovo; and related institutions, including several smart card and chip producers, system integrators, and academies (Shrader and Duflos, 2014). In May 2011, the Payment & Clearing Association of China (PCAC) was established through an initiative of MNOs and third-party payment companies. PCAC was a self-regulatory body of the payment and clearing service industry of China and was overseen by PBOC. On February 29, 2012, PCAC released the Self-Regulatory Pact for the Payment and Clearing Industry of China (Oak 2013).

4.11 Summary

This section reviewed the major events and actors' actions in China's banking system over the past 70 years. The history showed a rapid migration from a mono-bank to a modern banking system with diversity, liberalization and technology-driven innovations. The rise of FinTech cross-industry integration was eroding the legacy business model of traditional banks that had long-dominated China's financial market. Traditional banks were transforming themselves to fit in the new business environment and eventually propel changes in their operations. The Internet companies with a large and sticky user base, coupled with strong financial resources, were likely to be the new leader in the FinTech sector. Likewise, new opportunities kept arising for financial institutions that were agile and quick in expanding their online platforms.

The next Chapter will study how HSBC, as a foreign bank, adopted its innovation process and model into China's banking system, with a different set of business norms and regulatory framework from its home country, the UK.

Chapter 5: HSBC Case Study

Established in Hong Kong in March 1865, HSBC has strong flagship in the Asia-Pacific region and is the largest foreign bank in China. HSBC has over 9,500 offices in 87 countries. Asia and Global Commercial Banking remained the largest business location and segment contributions to the reported Profit Before Tax (PBT) to the Group, 83% and 34% respectively for the period of year ended on December 31, 2018. Asia business accounted for over 80% of the Groups' PBT. Retail banking (include wealth management), commercial banking and global banking accounted for 31%, 34% and 28% (total 93%) of its Group's PBT. (HSBC 2018 Annual Report).

What about HSBC in China? HSBC started operations in Shanghai as a branch since 1865. In the early years of the 20th century, HSBC widened its scope of activities in Asia Pacific. It increasingly involved in issuing loans to governments, especially in China, to finance modernization and internal infrastructure projects such as railway construction. During World War II, most of HSBC's branches in China were closed between 1949 and 1955, leaving only the Shanghai branch to continue some limited retail banking services. In the 21st century, HSBC aggressively grew its business in China both organically and through a series of strategic partnerships. For example, HSBC invested in some local banks like Hang Seng Bank (62.14%) and Bank of Communications (19.19%) operating in HK and the Chinese Mainland, while continuing to open its own branches throughout China.

HSBC China is headquartered in HK SAR, Shanghai and London. Its Shanghai HQ is responsible for China business development, people management, policy making, product innovation and risk management. With over 160 outlets including 23 branches and 48 Hang Seng Bank branches in major cities in China, HSBC represents China's largest foreign bank, in terms of size of branch networks, assets and investments. HSBC provides full-scope RMB and foreign currency banking services in China, including corporate, commercial, personal and private banking, payment and cash management, global markets, project finance, trade services, gold and foreign exchange services. HSBC had more than 5,500 employees working for HSBC China in 144 outlets throughout 45 cities. Over 98% of HSBC China employees were recruited locally.

Why is it interesting to study HSBC? It seemed that HSBC generally adopted an innovation approach of "exploitation" of existing competence, as opposed to "exploration" of new leading competency in terms of developing new and innovative financial products. For example, the

cross-border multicurrency pool, transaction and netting product in and with China was based on the existing well-developed cash management concept (notional or physical pool) and technology (Internet banking). This indicated that learning and customization was given high priority to in HSBC. The risk management officer confirmed this and said, "*Normally, we do not launch 'new' products. It is easier to 'add' new features to the existing product groups and explain to the regulator that the new enhancements do not change the risk and compliance profile of the existing product group*".

HSBC managed to create its own type of niche market proposition (regional international bank) with few direct competitors (such as Citibank and Bank of East Asia) in China. In this way, HSBC benefited form the opportunity to participate in the regulation consultation process and had direct communication with regulators to understand the regulation dynamics and sentiment in China. Regulators usually call major banks (foreign and local banks) to review the proposal for regulatory changes. Major banks are asked to provide comments on the proposed regulatory framework, the current market condition and potential market responses, the change implication and readiness for change. HSBC was usually asked to share the current practices in other regions and provide international perspectives on the proposed changes in the regulatory framework. In such instances, the local team would seek advice from the global team regarding the content and extent of such sharing. The risk management officer said, "*We usually develop an awareness of the coming regulatory changes from the consultative process. Based on this, internally we will discuss what changes are required from compliance and NPD perspectives"*.

To be able to develop financial innovations that were globally consistent and locally customized, HSBC chose a "global innovation" model to centrally prioritize, develop and deploy financial innovation product and process. People in HSBC sought to establish a network of international connectivity and leveraged on the global innovation development competency. Actions taken included implementing consistent business model, re-engineering global functions and processes, and streamlining the IT platform for financial product development. The local and regional branches were responsible for analyzing the local market needs and providing new product proposals for budget and development approval on a yearly basis. The global team would analyze the requests from all regions and categorized them according to the **six filters,** namely, connectivity, economic development, profitability, efficiency, liquidity and financial crime risks. The technology development was outsourced to service centers in India. The underlying idea seemed to be centralized innovation which was likely to foster product consistency, risk management, generalizability and cost reduction. This emphasized the importance of collaboration and team work to the development of financial products that met

the unique needs of each distinct market. In addition, IT tools and project teams were developed to support and enhance the collective innovation efforts. Hence, it seemed that HSBC relied on a mixture of regionally coordinated and globally controlled innovation development resources.

The next section will present a detailed analysis of HSBC's operations in China based on the framework of "environmental-strategy-performance" proposed by Tan and Litschert (1994) and Wright *at. al* (1995).

5.1 Business Environment

In general, although foreign banks' market share of total assets was small (1.64% on December 31, 2018) compared to the local banks, they were rapidly expanding their scope of services, geographic coverage, number of employees, wealth investment diversity, customer profile and general presence in China. As of December 2018, there had been 42 locally incorporated foreign-invested banks, 116 branches and 151 representative offices in China. While most foreign banks saw the commitment and support from parent bank in home country to help foster product localization, business promotion and rapport construction with local authorities, the regulatory constraints, such as foreign debt quota, loan to deposit ratio and foreign guarantee quota, remained the key concerns of foreign banks (EY, 2013).

As foreign banks became more skilled in navigating the Chinese market, they were still facing critical challenges in regulation, operations and market growth. On the regulatory front, the key challenges to foreign banks were the plethora of rules and regulations, difficult access to the growing bond market, and the continued capital and liquidity constraints. Operationally, foreign banks were challenged by human resource issues, the complex legal environment and the pressure to maintain a satisfactory profit level. On the financial performance side, their top concerns included interest rate margin compression, attracting retail customers and increasing competition from domestic banks. Despite the challenges, internationalization of Renminbi, interest rate liberalization, and the form and relaxed regulation in SFTZ brought new opportunities to foreign banks (EY, 2013).

In response to foreign banks' demand for market liberalization, in October 2019, Chinas' State Council announced measures to further open up its financial sectors to foreign investors by loosening regulatory requirements and lifting business restrictions on foreign banks and insurance companies. China relaxed market access rules for foreign insurance companies, such as removing requirements that companies applying to establish foreign-invested insurers in

China have a track record of over 30 years in the business and have a representative office in the country for over two years. The government also liberalized requirements on the percentage of stakeholders and foreign banks that plan to invest and set up operations in China. Other revisions included allowing foreign banks to simultaneously set up branches as well as wholly foreign-owned banks, or branches and Sino-foreign joint venture banks, in China. Also allowed was expanding the business scope of foreign banks by lowering their branches' threshold of fixed-term Renminbi deposits to 500,000 yuan from -1 million (to $70,610 from $141,220) per deposit.

How did HSBC see its business environment, challenges and opportunities in China? In 1980s and early 1990s, due to many uncertainties in Asia Pacific, HSBC changed its business development focus to the US and Europe markets. However, after 2000, the Asian economies became active again. HSCB decided to switch its business focus back to Asian countries. In this landscape, HSBC took a series of actions to study the Asian market and develop its relationship with the local governments, especially with Hong Kong, the Chinese Mainland, Malaysia, Singapore and Macao. The Chinese Mainland was one of HSBC's priority growth markets in Asia Pacific. HSBC had a number of significant investments in China including Bank of Communications, Hang Sheng Bank, Industrial Bank (disposed in 2015), Shanghai Bank (disposed in 2013) and Ping An Insurance (disposed in 2012). HSBC continued to expand its branch network to cover Tier-One and Tier-Two cities in China. In addition, the bank also expanded its wealth management capabilities to meet the investment needs of wealthy Chinese investors (HSBC 2018 Annual Report). Despite seeing various opportunities across the financial spectrum, foreign banks needed to adjust their strategies and adapt to the business environment in China. "*You cannot simply replicate a successful entry strategy from other Asian markets to the special needs and characteristics of the Chinese market*", said an industry analyst. As evidenced, HSCB introduced several financial innovation products that specifically addressed the needs of the Chinese market (see Performance section below).

HSBC continued to identify and recruit local talents to support its growth. Of the 235,000 HSBC employees worldwide, 19,000 employees were working in China. The lack of critical talents remained a perennial issue for foreign banks operating in China. "*We are aggressively recruiting talents, but this is driving up salaries. We continue losing employees to new foreign banks and the turnover rate has been between 20% and 40%, with the highest rate in retail business. HSBC is believed to be a training institute for foreign and domestic banks*", said a HSBC branch manager.

Stuart Gulliver, HSBC Group's ex-Chairman, was a regular visitor to CBCR China. He

was one of the members in CBRC's International Advisory Council which regularly met and discussed issues on changes in the international banking environment, influence on regulation, banking services for the real economy, financial support for SMEs, as well as consumer protection and education (HSBC 2013 Annual Report). The bank leadership made regular visits to regulatory officers and promoted how the bank can help China in the financial system transformation and support government's initiatives such as Renminbi internationalization and financial service innovation. HSBC had strong confidence over the Chinese market and continued to pour resources into China to drive business performance.

On the other hand, HSBC also saw risks in its operations in China. These included hard-landing of the Chinese economy, weakening property market, the decrease in equity price, unemployment issues and low GDP growth. In addition, the regional tension between China and its surrounding Asian countries and the trade war between China and the US also added uncertainty to banking development. HSBC believed that the "new normal" and rebalancing of the Chinese economy from manufacturing export to internal consumption focus would create new demand for innovative and customer-oriented banking products. "*The Government is fully engaged to create an innovation-driven economy. New opportunities will emerge, but realizing them will require a more focused and innovative approach in China. The Chinese regulators like new ideas. Foreign banks and FinTech firms are used as a means to drive financial innovation in domestic banks*", said the product development manager. CEOs of foreign banks continued viewing the impact of regulation as their biggest challenge. Some banks viewed this situation as a burden, while others were proactively engaging with the regulator. The risk management officer said, "*The Chinese banking regulators have been supportive over the period. In certain circumstances, I think CBRC is more supportive of innovative products and service offerings than regulators in our home market*".

5.2 Business Strategy

Global banks such as HSBC are expected to provide international connectivity to support global clients' business needs. International connectivity is defined as the ability to provide its business customers with access to both developed and developing markets, enabling them to participate in global growth opportunities at HSBC. HSBC considered its international network a key differentiator from its competitors and one it needed to protect. Furthermore, global banking business represented a significant revenue generator for HSBC that needed to be

preserved through an enhanced international network (McLarney & Trudeau, 2017).

HSBC's corporate objective is to become "the world's leading international bank". To achieve this, HSBC set its long-term strategic priorities to (1) grow the business and dividends; (2) implement global standards; and (3) streamline processes and procedures. Some key initiatives underneath each strategic priority are summarized below:

(1) Grow the business and dividends

- Generate capital to invest in mostly organic opportunities at home and priority growth markets, while progressively growing the dividend.
- Use six filters to determine portfolio-fit businesses and identify non-strategic businesses to dispose of.
- Follow a stringent framework to assess investment opportunities using strategic, risk and financial criteria.
- Decisions on how and where to allocate resources are made by the Group Management Board under authority delegated from the Board

(2) Implement global standards

- Adopt and enforce the highest global standards across HSBC.
- Invest in world-leading risk and compliance, while seeking to reduce the overall risk.
- Implement global standards for seamless customer experience over a connected network of businesses.
- Three primary focuses are customer due diligence, financial crime compliance and financial intelligence.

(3) Streamline processes and procedures

- Put in place a structure to manage the bank globally, rather than on a federated basis.
- Streamline, globalize and simplify processes and procedures to generate sustainable savings.

HSBC's branding strategy is becoming "the world's local brand". Through its localized services/products and established relationship with local government, HSBC generally achieved a high-ranking market reputation in high-end/premium local customer groups. HSBC had an extensive branch network coverage in each local market, and it was actively expanding its e-channel and co-channel capabilities (such phone-banking, E-baking and alliances with

local financial firms). With its market reputation, HSBC was also attractive to many experienced financial talents and new graduates. HSBC established strong local sales teams, including customer managers, private banking managers and direct sales teams in each local market. As we can see in its core values of **integrity**, **trust** and excellent **customer service**, HSBC continued to invest and develop a customer-centric business model. This included excellent customer services at branch and CRM system that can support one-to-one customer sales and service. In terms of product strategy, HSBC was not a creative product market leader (compared to Citibank, perhaps). In generally, HSBC had longer NPD cycle time than the industry average. However, HSBC new product cost was probably the lowest among international banks. This was achieved by developing standard product features that could be easily adopted in each local market. Nevertheless, HSBC responded fast to NPD needs in emerging markets, such as China. HSBC had strong ties with local government and in many cases developed new products to support the local government's fiscal/monetary policy such as the issuance of dim sum bonds in response to the Renminbi internationalization initiative.

What about HSBC's strategy in China specifically? HSBC continued to expand its leadership in Greater China. Two of the key priorities were continuing its leadership as China's top foreign bank and being the leading international bank for Renminbi (RMB) worldwide. Specifically, HSBC aspired to capture the increasing international connectivity (in business, trade and investment) between China and the world, including Chinese enterprises "going out" and Hong Kong/International companies "going into China". In terms of RMB banking, HSBC continued to develop core RMB products and leveraged on its international connectivity and global development capabilities to increase market share and product variety. In China, 30% of the population were located in top-10 city clusters which contributed to 70% of international transactional banking business for HSBC (HSBC Asia Strategy).

In summary, **HSBC's overall business strategy was risk-conservative and environmental protective.** This was consistent with HSBC's branding of "the **core values of HSBC** are **integrity**, **trust** and excellent **customer service"**. The risk management officer from HSBC Shanghai reinforced this and confirmed that "*HSBC's market proposition is risk-averse, second runner of innovative financial products and focuses on supreme customer services*". As a result, we have not seen many "new-new" product innovation in China. Instead, we are seeing more international financial innovations in HSBC being customized to the Chinese market (see Performance section below).

5.3 Business and innovation performance

The analysis of HSBC bank's performance is divided into two parts, namely, business performance and innovation performance. The first part of performance analysis focuses on the financial and operational performance of HSBC in China specifically, while the second part of performance analysis focuses on the product, process and business model innovation of HSBC in China. The analysis timeframe is from 2014 to 2019, generally based on information extracted from annual reports and interviews with HSBC personnel, industry practitioners and analysts.

HSBC's financial performance in China continued to exceed other countries. During the period from 2013 to 2018, China's profit before tax increased by 10%, well above the Group's average growth of 8.4%. The analysis of performance in this section, however, focuses on the product innovation of HSBC in China. HSBC's quality of service, product innovation and commitment to the Chinese Mainland were illustrated by the amount of investment the bank made in digital and technology related initiatives. In October 2017, Hong Kong Science and Technology Parks Corporation (HKSTP), HSBC and Hong Kong Business Angel Network (HKBAN) joined hands to launch SPRINTER, a two-year program aimed at energizing the local innovation and technology ecosystem to support Hong Kong's bid to become a regional technology hub. In May 2019, HSBC announced opening its first two data and innovation labs, respectively in London and Toronto, in a bid to accelerate the development of innovative data, cloud and robotics solutions for clients of its Global Banking and Markets (GBM) division. The labs, which formed part of a wider global strategy to simplify and enhance the bank's technology, were expected to serve as hubs for building creative partnerships and co-development opportunities with companies specializing in emerging technologies, including artificial intelligence.

Between 2015 and 2019, the bank created new platforms and partnered with technology companies such as Tencent's WeChat. HSBC allocated $200 million globally for investment in FinTech and enterprise start-ups. HSBC was one of the first foreign banks to allow retail and commercial banking customers to access services through WeChat and alert customers potentially fraudulent activities in their accounts. HSBC also invested in and partnered with IT firms, such as IBM, to develop its capability in blockchain, artificial intelligence, robotics process automation and cognitive technology to handle invoices and trade documents and detect fraud, potential illegal and money laundering activities. "*Banks no longer view Fintech as a disruptor, but instead as an enabler and HSBC is partnering with Fintech to allow us to*

strengthen our solutions with more integrated propositions", said the head of growth and innovation of commercial banking division. HSBC also collaborated with FinTech firms in technology innovation. In 2019, HSBC launched a digital personal loan product for U.S. consumers to improve the efficiency of the underwriting process and responded to customer demand for a digital personal loan option. HSBC partnered with a startup technology firm to provide this digital loan product.

Business performance, financial innovation and regulatory supports were inter-linked and mutually dependent. For example, In 2013, HSBC offered its first innovative Renminbi (RMB) product and services to capture new opportunities in trade, capital and financing flows as a result of RMB internationalization. The new product innovations included (1) automated cross-border multicurrency cash pool; (2) cross-border multicurrency netting facilities tailor-made RMB cross-border centralized payments and collections settlement product. These new products were introduced as part of the initiative to Chinese government policy. Chinese government promoted RMB internationalization through several legislation incentives. Formal regulation (the Notice on Simplifying the Process of Cross-border RMB Services and Improving Relevant Policies, "the Notice") was issued on July 5, 2013, which took effect immediately. The financial innovation, besides supporting the Government agenda, also yielded recognition and revenue performance in the market. For example, HSBC was asked by China's MOF to lead the offshore RMB bond issuance, including the issuance of RMB 3 billion (US$491m) government bonds in December 2013. HSBC also acted as sole bookrunner on a *dim sum* bond issuance for the first foreign government to issue in the Chinese market. In addition, HSBC was the first foreign bank in China to implement a customized RMB cross-border settlement solution and was also the first foreign bank to complete a two-way cross-border RMB lending transaction. Because of these localized products, HSBC was voted the "Best provider of offshore renminbi products and services" for the second year running by *Asiamoney.* HSBC also won the award for RMB House of the Year from *Asia Risk*.

In China, HSBC continued to achieve double digit growth in home mortgage business balances in each of the last three years HSBC (2013 to 2019) by leveraging on its global process innovation capability. For example, in 2018, HSBC re-engineered its process to accommodate increased volumes and to speed up the approval of loans in China. HSBC reduced the overall turnaround time from 12 days to six days. Through the "Decision in Principle" service, HSBC was able to give customers the results of their initial screening within one hour.

5.4 HSBC: Aspects Related to Research Questions

This section tries to answer the research questions put forward in the first chapter of this thesis. Data in this section are primarily based on interviews with officers from HSBC China. To make the interview discussion more specific and concrete, the interviewees were asked to share specific examples from their business functions. Therefore, materials presented in this section refer to innovation in (1) Global Trade and Receivable Finance (GTRF) Department and (2) Global Payments and Cash Management (GPCM). The interviewees were from Product Development (Product), Sales and Marketing (Sales), Business Risk Control Management (Business Risk), CRM and Risk Management (Risk) departments. In addition, written materials (if applicable) and observations were used as supplements.

Global Trade and Receivable Finance (GTRF) provides transactional banking for international import or export business in terms of documentary processing and trade financing. The financial products include import and export documentary credits, finance, guarantee, collection, advisory and insurance. Payments and Cash Management (GPCM) offers flexible and comprehensive payments and cash management solutions that help business manage receivables, payments, liquidity management and integrated E-banking operations. The content below elaborates on what and how financial innovation is carried out in HSBC.

5.4.1 Financial Innovation Process

Based on the interview with the Product officer, **the financial product innovation process in the payment and cash management division is presented as follows.** On an annual basis, HSBC Group allocates funding to each service line for NPD or enhancement. The budget is further broken down by location (regional and country). Due to the strong market performance in China, NPD budget for China market increased substantially in the past few years. Once the Product team gets the budget allocation from Global, they will talk to the Sales team to understand the market needs and trends. Based on feedback from Sales and Relationship Manager of key accounts, the Product team will propose a list of items for development in China. The NPD proposal will be submitted to the Regional and Global teams for review and approval. The Risk team will provide comments in the NPD proposal whether the new development or enhancement is complied with local regulation and global standards requirements. Once the NPD proposal is approved (some maybe rejected), the Product team

will work with Risk, Compliance, IT and Sales teams to further develop the new product features and specification.

At the product conceptual phase, the Sales/CRM teams may approach/invite certain key customers (pilot customers) to join the product development process to provide "customer feedback, comment or suggestion" to the new product features/functions. When the new product prototype is developed, pilot customers will be asked to help test out the new product functionality and features. The Product team will incorporate the customers' comments and testing feedback in the NPD process to enhance user friendliness and acceptance features. This is a good practice to identify pilot customers to participate in the early stage of NPD. This will also help gain market acceptance and probably has some used cases when the new product is launched. The risk is that, however, the pilot customers may not be representative samples and may not provide different views of all potential customers. When the new product is fully tested and ready to deploy, the Product team will conduct training for the Sales, RM and Backend support teams, to understand new features and prepare for market launching.

In the launching of new products, (1) The Relationship Manager identifies target customer, (2) the Sales team understands customer needs and recommends product selection/solution suite, (3) The Implementation team provides training and setup connectivity/infrastructure, (4) The Integration team works on system interfaces and EDI exchange between customers and the bank, (5) The Relationship Manager completes the contractual MOU, (6) The Operation team helps go live. "*We provide comprehensive tax optimization liquidity solutions in China, which include Standard Structure (zero-balance sweep); Tax-optimization 1G (proportional sweep); Tax-optimization 3G (zero-balance sweep with HSBC account as intermediary); and Tax-optimization 2G (proportional sweep with HSBC as master a/c). All of these globally-developed and locally-adopted products have different implications on master account, business tax, account booking, interest allocation, credit facilities, sweep and reporting options. We are sensitive to local government policies and innovative to meet domestic customers' needs. We adopt a uniform innovation process across regions and business lines*", said the Product officer.

Based on the interview with the Business Risk officer, **the financial product innovation process in the trade and receivable finance division is presented as follows.** Generally, the idea of innovation is obtained from customers, the relationship manager and internal analysis of customer needs via the Management Information Department's reports. Sometimes the Request team (can be Sales, CRM or Product) will first "pre-check" or discuss with the Compliance department verbally to find out whether the new features are acceptable from a risk and compliance standpoint. When risk and compliance clearance is obtained, the Request team

will raise a new product or enhancement feature request in a draft version to seek the multidisciplinary department comments (such as Finance, IT, Risk, Compliance, Legal and Operation departments) on the proposed product's features. After that, a "product pack" will be developed and sent to the Skill Line Global team for review to check whether the new products/features comply with the Global standards and the Risk and Compliance requirements.

After incorporating comments from the Skill Line Global team, the revised "product pack" final version will be sent to the local compliance team for review to check whether the new products/enhancements comply with regulatory requirements of CBRC, PBOC and SAFE. If required or when in doubts, the local compliance team will communicate with the relevant regulatory officers to seek advice or guidance. Once it is approved by the local compliance team, the IT and business departments will start working out the IT systems and working process to support the new products or enhancement features. The IT and working process prototype will need to be approved before launched to the market. Sometimes, if the new enhancement is requested by regulator, the relevant regulator will go on site to review the IT system interface and connection, and internal control mechanism before the new product or enhancement features can be released to the market. Only the HQ in Shanghai has the authority for new product and enhancement development. All provincial new product and enhancement demands are centralized at HQ for review and development.

Because trade and receivable finance products are very linked to the custom and foreign exchange declaration process, innovation must be first communicated with the relevant authorities for documentary, process and system support. Along with global trade and internationalization of Renminbi, the local governments are pushing more innovation and enhancement at banks. However, the innovation diffusion is on a case-by-case basis. Sometimes, the regulators may approve new products and enhancement to be launched in certain provinces (on a trial basis), and sometimes the regulator may require standardization and county-wide launching. The new products are released or made known to the market by (1) the Relationship Manager (CRM) through Information session, marketing to existing clients base, and co-promotion with the product or corporate banking team; (2) the Call Center through cold calls to existing clients and introduction of the new product or enhanced features in the market; (3) Internal Promotion through cross-department sharing and information session; and (4) Online and Offline Marketing to specific target customer group.

"Generally, there is no "new-new" product development in GTRF core trade and receivables finance business, but we continuously enhance the features of the existing products (incremental change in NPD) as per SAFE requirements. During the application of new

product/enhancement, when we receive comments from regulator that it is a "no-no" status, we will stop the application process. To HSBC, its own reputation is much more important than its revenue, profits or ROI (Return on Investment). When we sense that the regulator has some concerns (but not a "no-no" comments), we will try to adjust the product features and control procedures to reduce the regulators' worries. Likewise, we also seek comments from the Global and Local compliance teams, and make adjustment to the product design, process, systems and features according to the change request," said the Business Risk manager.

Unlike other industries, the financial industry is highly regulated and scrutinized, particularly so in light of the 2008 Financial Crisis. Government regulation on Financial Services players is becoming increasingly stringent, especially for risk control, further constraining financial innovation. "*You will not want to engage in a costly innovation if you cannot ascertain the real future benefits. In the financial service sector, the innovation decision is quite often affected by the relationship with the local government*", said an industry analyst. "*There was an interactive commitment between the Chinese government and HSBC, and this commitment relationship reduced HSBC's transaction costs by limiting the possibilities for government opportunism….. The current Chinese economy is a government-oriented market economy, rather than a central-government controlled one. The central government still plays a very important role in the economy, but regional administrations have gained significant economic power*", said Lu (2008) in a conference paper published by Oxford Press.

Table 5-1: Process comparison between two types of innovation products

	Payment and cash management	**Trade and receivable finance**
Product features	Closely linked to the customer's receivable, payment and liquidity management. It also affects the business tax compliance process.	Closely linked to international business and regulatory authorities' policy, documentary process and system.
Innovation type	Incremental (enhancement features on standard cash management product); and Radical (NPD, such as cross-border and notional cash pools, when there are radical changes in government policy, information technology and customer demand)	Incremental (enhancement features on standard transactional banking products)
Idea generation	Customer demands	Customer demands and regulatory development

Prove of concept	Invite customers to participate in the new product testing or soft-launch process.	Informal approvals from relevant regulatory officers
Development	Vertical (Global, regional and local skill lines) and Horizontal (Finance, IT, Risk, Compliance, Legal, Operation and Product teams) financial innovation process	Vertical (Global, regional and local skill lines) and Horizontal (Finance, IT, Risk, Compliance, Legal, Operation and Product teams) financial innovation process
Diffusion	Standard process on targeted customers	Non-standard, based on the regulators' approval and implementation plan

Source: Author analysis

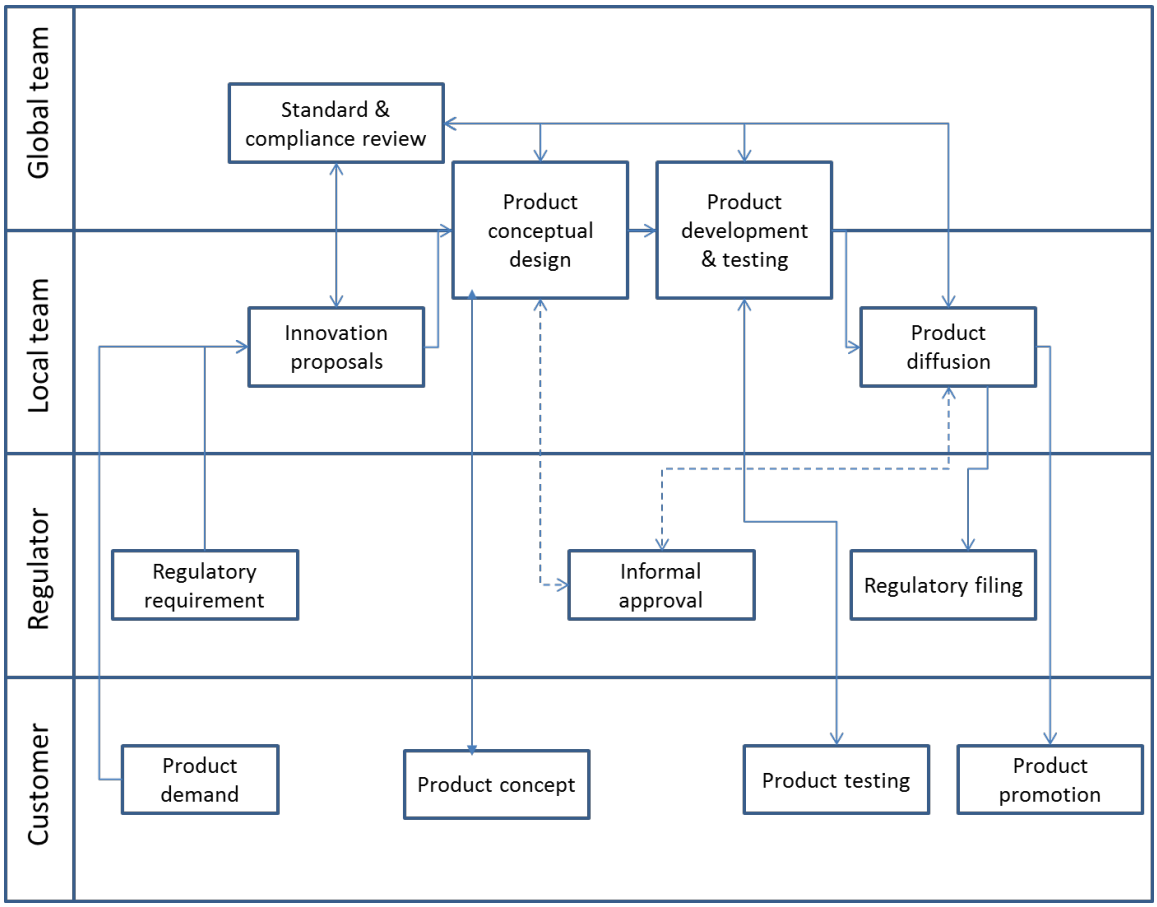

Figure 5-1 Financial innovation process at HSBC

Source: Author analysis

Further analysis

The financial innovation process at HSBC shows a few interesting features. Generally, HSBC adopts a global financial innovation strategy and process. New products need to fit in the global product standards and business strategy. The whole financial innovation and new development process is closely monitored by the Global and Risk Management teams to ensure global standards and local regulation compliance. HSBC does not promote too much localization in product development, unless with compelling reasons, such as local government requirements.

HSBC applies two ways of communication in the financial innovation process. First, on a vertical line, where the local team needs to constantly review the development idea, concept, product, risk control, development and deployment details with the Global and regional team within each skill line. Second, on a horizontal basis, the local teams need to conduct regular cross-departmental (Finance, IT, Risk, Compliance, Legal, Operation and Product teams) communication and alignment throughout the financial innovation process to ensure effective coordination of activities and events locally. Although this improves overall product and process consistency across locations and departments, it stretches the financial product development timeline and slows down the time-to-market.

HSBC uses a multidisciplinary approach in financial innovation process. First, the regional team may not be in the host country and may have limited knowledge on the local market requirements and policy framework. The local team needs to justify the NPD to the regional team with quantitative and qualitative analyses. After justification is proved, the regional team will need to agree on the development priority, budget, timeline and supporting resources with the Global team. Once approved by the regional and global teams, the local team needs to co-design and co-test the new product with the system development house in India. This is a time-consuming process due to time zone, culture and language differences. In short, the Product team at HSBC China needs to work with multidisciplinary teams with different business focuses, interests and cultures in a NPD project.

The next section will review how HSBC, as a foreign bank, responds and reacts to regulatory changes in China's financial laws, and how it reconciles the regulatory dialectics with its global policy.

5.4.2 Regulatory Dialectics Reconciliation

How is HSBC, as a foreign bank, aware of financial regulation changes in China? Regulators usually invite major (foreign and local) banks to review the proposal for regulatory

changes. Major Banks are asked to provide comments on the proposed new or changed regulatory framework, the current market conditions and the change implications. Foreign banks are usually asked to share their experience in other regions and provide international perspectives on the proposed changes and impacts on the economy. This is an avenue to obtain an awareness of the coming regulatory changes based on the policy consultative process. Based on this early information, Banks will internally discuss what changes are required from compliance and NPD perspectives. Based on the last few years of regulatory reform, the regulatory framework in China is becoming more convergent across locations and consistent in enforcement. This is good for foreign banks operating in China. Some of the regulation improvements or revisions are results of policy gaps from financial innovation. In such cases, innovation is driving regulation revision.

"*Above all, it is important to 'sense' that the new product is within the regulator's promotion list*", said the Product officer. On the other hand, the product development may become less successful (or facing constraint) if market conditions change. For example, a direct debit product can become obsolete when the multiparty agreement conditions change. New "user-friendly" product from Internet operator and local regulation changes may replace the existing banking products. Therefore, "*the product team needs to have a good sense of the new product lifespan before investing time and efforts to develop. The "good sense" can be obtained by talking to Sales, Relationship Manager and regulator*." said the Product officer. The Product officer emphasizes on the importance of **"market senses of what, who and why"** as key aspects that will facilitate or constrain the financial innovation in payment and cash management at HSBC.

When reviewing the case of trade and receivable finance, it seems that regulator plays a greater role in facilitating or constraining financial innovation. At the end of every year, all banks are required to submit a risk internal control documentation to the regulator (CBRC) to review, and CBRC will complete the review at the end of March in the following year. Regulators may also conduct onsite and offsite audit on selected topics based on the internal control documentation. "*We will ensure to score high within the risk control inspection and assessment. When a bank scores high in the inspection, it is considered a less-risky bank in the eyes of regulator. Innovation and change initiatives from less-risky banks are generally more supportive by the regulators and under less scrutiny*", said the Business Risk officer.

Sometimes, before the regulator wants to launch a new policy and/or promote financial innovation in certain areas, some large size foreign banks are usually called to the discussion table and provide views, comments and suggestion, or share best practices in overseas markets.

Certainly, foreign banks are not price competitive in the market and lack of operation capitals (customer base, liquidity, resources, talent and branches) compared to local banks. Foreign banks need to continue leveraging on its overseas customers, reputation, services and responses to the market in order to be competitive. Therefore, another critical success factor in financial innovation is "leadership commitment". "*The **leadership commitment** is important to ensure a smooth vertical and horizontal collaboration in the organization, commitment for resources and effective communication with/ for support from the regulators*", said the Business Risk. However, the new products/enhancements will take a long time to review and approve when it involves many departments and levels. If the innovation needs to change or affect the current IT system design or interface, it will take even a longer development time to the market, unless with Management push-through. "*Communication can be a constraint to innovation in a large organization with a multidisciplinary (cross-cultural teams) and matrix (reporting lines) operational environment when consensus is generally required, and all are trying to avoid taking any risks",* added by the Risk officer. However, when the return is lucrative, financial innovation always comes with risks (such as CDS in US sub-prime loan), and responsible innovation is important to protect the interest of financial consumers. Therefore, the interviewee mentioned that, it is important to check if the innovation is not crossing the red-line of regulation.

"*Some "creative" banks may identify gaps in the regulations to exploit for higher margins, some may "conservatively" stay on the safe side in product development. Therefore, leadership directive & commitment and regulatory support become critical* in reconciling the regulatory and performance dialectics", said the Risk officer. For example, for some policy-driven innovations (such as loans to SMEs), **"regulatory trade-off"** is important to facilitate the innovation and product promotion. Bank managers are not motivated to sell or promote these types of low incentives products. However, it is important for the bank to support government policy as a "trade-off" in exchange for regulatory support in other areas. In this case, as the interviewee mentioned, leadership commitment is important to ensure smooth vertical and horizontal collaboration in the organization for commitment of resources to support the regulatory agenda. Innovation constraint in this case, is low motivation to innovative at line manager level. The innovation is only to fulfill a policy or political agenda with low revenue prospects to the bank and individuals.

According to the Product officer at HSBC, sometimes, regulator find out some good financial products in overseas matured markets, and they will usually call out to international banks operating in China, such as HSBC, Citibank and DBS to join a consultative discussion

to understand the product features and evaluate whether such products are suitable for deployment in the local Chinese market. Regulator may also share some insights with local banks and check their readiness and risk assessment with these new products. Likewise, if the regulator wants to promote internationalization of Renminbi, a lot of cross-border Renminbi transfer policies are relaxed, and banks are encouraged to develop new products such as "intragroup overseas loan" to support the new policy. This is a typical type of regulatory-push innovation. In short, regulatory changes are facilitating financial innovation development. "*The regulation should be more transparent in China. As you can see, many regulatory changes on Goods Trade in the past 4 to 5 years regularized the practices and improved operation efficiency of the banking system in China. We are responding positively to these changes. This is good for foreign banks as regulation becomes clearer and easier for us to operate. Innovation is easy to conduct when the regulation intention and boundary are crystal clear*", said the Business Risk officer.

Based on the discussion with Business Risk officer, HSBC's innovation and change strategy in a regulated and constrained environment (like in China) is stability and growth. There are a lot of risks and uncertainties in financial innovation. The Chinese regulators do not like surprises, and they may want to help "nurture" the financial market before it can take on more risks in innovative financial products. Therefore, HSBC's overall strategy is "good boy" to enable it to grow stronger and bigger by sharing more advanced practices with the regulators.

The regulatory environment in China is very tight but has improved a lot (in terms of openness and clarity) over the last ten years. Renminbi is still a restricted currency in the world economy, and it is becoming internationalized along with more and large cross-border trade and settlement using Renminbi. The regulatory environment is improving for its convergence, consistency and transparency. Local banks are learning fast and continuing to expand their footprints in the domestics and overseas market. The possibility of financial crisis, such as sub-prime loan, as a result of innovative financial instrument is remote. The Government is a good control through the banking system. "*Financial innovation in China is under tight scrutiny by the regulators. Recently, the regulators are promoting "behavior scrutiny" of the bank itself. This is a good development as the bank should install internal procedures and processes for its "responsible financial innovation*", said the Risk officer at HSBC China.

To reconcile the dialectics between financial innovation and regulatory compliance, HSBC actively manages the risk and compliance before and during the innovation process. HSBC has set up two independent bodies to review the innovation from a regulatory compliance perspective. Risk is responsible for reviewing if the new/enhancement product complies with

the Bank's Global (UK &/or US) and regional (HK) standards/guidance and local regulatory compliance requirements. The output is yes/no/yes-with-condition to new/enhanced product request department. BRCM, on the other hand, is responsible for helping the new/enhancement product request department to pre-review the application from all business risks (reputation, compliance, credit, operational and liquidity risks) and compliance standpoint. It provides consultative advice to the request department on how to enhance the product description, design and risk control in order to satisfy the risk control and compliance requirements, by reviewing the products and discussing the requirements with the Product team.

The next section will review how financial innovation capabilities are being managed, appraised and developed at HSBC.

5.4.3 Financial Innovation Management

According to the interviewees, HSBC adopted a diversified management approach to financial innovation. Under this approach, Headquarters (HQ), regional and local banks have specific roles and responsibilities in product innovation. HQ bank is responsible for market research, product R&D, new product review and approval, product risk management and innovation performance management. Regional bank is responsible for identifying and developing products that meet regional needs. Local bank is responsible for promoting the new products to the market and targeted customers. HSBC's innovation strategy is "global standard compliance and local regulatory risk management". In the NPD, the local product team first checks if there are existing / similar products in the solution profile/catalogue. If yes, the development approach is to "directly use with no change", "limited adaptation" or "major customization" to meet the local market needs. If it is not in the global product catalogue, the local product team will establish a business case (together with Sales and Risk) to justify the development and forecasted revenue, profit and ROI of the new invention needed.

Based on the interview results, the innovation performance appraisal for payment and cash management is based on (1) new or additional revenue generated; (2) the product life span; (3) the ROI (Return on Investment) from the new product; and (4) net profit from the new product. Likewise, trade and receivable finance also applies a similar innovation performance appraisal matrix of revenue, profit, ROI, additional/new customer and customer feedback. All the innovation performance appraisal criteria used at HSBC are specific, measurable and mostly financially oriented. HSBC also invested in a Management Information (MI) system that allows

for intelligent data mining on the product performance, prospects and related sales – the way to manage and evaluate product performance.

As mentioned by the Product officer of payment and cash management, a simple innovation that connects HSBC customer networks may yield a big market impacts when the prospective user group is large enough. For example, HSBC Korea was recognized for its B2B Xpress platform supporting online supply chain settlement. The buyer/seller-centric solution provided by the Global Payments and Cash Management (PCM) team in Korea has been able to meet the Bank's business and IT operational performance requirements, as well as address key clients' needs in supply chain management including operational cost efficiency, financing flexibility, real-time management of information, and risk management. B2B Xpress joins up large corporations with their buyers and suppliers in a seamless manner. One good example is Unilever Korea, which automated its back-office processes and was able to improve relationships with around 200 suppliers when HSBC opened accounts for all of them via B2B Xpress. B2B Xpress forms part of HSBC PCM's Korea Xpress suite of cash management products, developed and rolled out in 2006. Korea Xpress is tailor-made to meet the needs of all businesses operating in Korea, from SMEs to global multinationals, while leveraging HSBC's global proposition for Korean Corporates' cash management requirements outside Korea. In this way, HSBC is delivering the "World's Local Bank" franchise to local and foreign entities in Korea.

All interviewees at HSBC, from Product, Risk to Sales, agree that HSBC strongly recognize innovation as one of the core values of HSBC global standards. Within the employee performance scorecard, there are elements of innovation contribution. Also, leadership recognizes innovative ideas in product, service and customer development. Collaboration with colleagues from different backgrounds, departments and countries representing diverse competence and experience is highlighted throughout the interviews as key to innovation cultivation. Further, the professionals do not only learn from colleagues; meeting the client face-to-face also facilitates innovation learning and competency development. In addition, competent and demanding multinational clients with unlimited and non-ending request for service excellence and profit improvement force HSBC to continue to invest and develop its innovation competency.

"*We have vertical and horizontal information sharing to leverage on successful innovation practices/experiences. Sales conduct regular reviews with Global team to learn about new product launch in other regions and discuss how these can be adopted to the local market needs. We have regular information sharing session with other departments to understand what is*

happening in the organization", said the Sales officer. Apart from internal informal communication (vertical and horizontal), there are many external information communication platforms (such as ex-colleagues, school or college mates and regulators) to exchange ideas on market development, regulatory trend and networking. This is a forum to obtain market information and socialize ideas/risks precautions.

Besides corporate culture and practice to promote innovation, creative employees are also very important. To enhance our competitive advantage, HSBC continues to expand its location coverage in China, attract talents and streamline our operating process to meet the market needs. *"Our people are very creative, and we love to see new ways of doing things differently and better*", said the Sales officer. The high people attrition rate in the financial service market is common, especially in a developing market such as China. "*We have people "going-out to" and "coming-in from" other banks. Therefore, we know each other in the market and what is going on. Best practices are shared when people move from one firm to another. More importantly, it is also element of innovation competency development*", said the Business Risk officer. There might be some "informal information sharing / exchange" process in place between banks through some informal networks. Generally, financial innovation product is easy to copy as "all terms and conditions" of the new products are written down in the contract with customers. However, the competency in IT, service and customer base is difficult to copy in the short term. The request department needs to collaborate closely with the product and compliance teams in the innovation process. There are many informal discussions and "exchange thoughts" going on vertically and horizontally. These is "oil" in the innovation and change success process.

HSBC has put in place many incentives to promote innovation competency development, including (1) Management Trainee program to attract "excellent graduates" and assign them to routine jobs in different departments to gain an overall understanding of banking practices in the first two years of enrollment. This helps bring up the innovation competency in the later stage of their careers. (2) Internally set up an IT solution organization to be responsible for all "major and critical" IT/System development projects. This helps align IT's goals and tie to the business performance. (3) Management incentives like cross-department information session and team building. This helps improve the communication process during innovation and change.

Based on the interview feedback, innovation competency development is a combination of management incentives, corporate culture, talent attraction, IT capability, effective communication, information sharing, new services/product delivery and customer-centric

service approach. HSBC seems to continue to invest in its IT capability, streamlining processes and new services/product delivery capability. IT is critical and key in innovation process. All financial innovation and risk compliance activities need to go through the IT systems for processing and reporting. HSBC core IT system is globally connected and maintained by its professional in-house development team located in its IT hub in India.

5.5 Summary: An Actor-networked Innovation Process

The empirical study shows that HSBC has adopted a global-driven innovation strategy and process. New products need to align with global product standards and the business strategy. HSBC does not promote local product development, unless there are compelling legal and market outlook reasons. Local government can significantly influence foreign banks' decisions on product innovation. Lu (2008) finds an interactive commitment between the Chinese government and HSBC, and this commitment relationship reduced HSBC's transaction costs by limiting the possibilities for government opportunism. Branches of international banks prefer to use the knowledge and experience possessed by other affiliates belonging to the identical corporate group (Martovoy & Dos Santos, 2012). By doing so, these firms only adapt services to local needs – services which were otherwise developed in a different context and without the involvement of clients (Schueffel and Vadana, 2015). HSBC manages innovation activities on a global scale, actively using international talent teams in response to local innovation needs. Having global innovation capability and local participation in the innovation activities helps ensure business process standardization and international practice harmonization. However, this arrangement prevents HSBC from responding quickly to volatile market conditions and changes in local monetary policy.

Two types of innovation communications were observed at HSBC. In global-local communication, the global team conducts a cross-market review of new development ideas, product concepts, specifications, risk control, testing and deployment details with the local team within each business function. In local-local communication, the local team conducts domestic cross-functional coordination activities in the innovation deployment process from domestic legal review and knowledge transfer to innovation diffusion. Although both forms of communication improve innovation engagement and diffusion across locations and business functions, having both increases the development cycle time and time-to-market. "*Over-communication can be a constraint to innovation in a large organization such as HSBC. Our*

innovation operates in a multidisciplinary and matrix reporting environment. Consensus takes time to achieve when all functions are trying to avoid risk-taking. Therefore, leadership commitment is important to ensure collaboration in the organisation. Effective allocation of resources and communication with legal and regulators are critical to innovation diffusion success," said the bank manager.

The following diagram illustrates the actors and their activities at HSBC in relation to the financial innovation process.

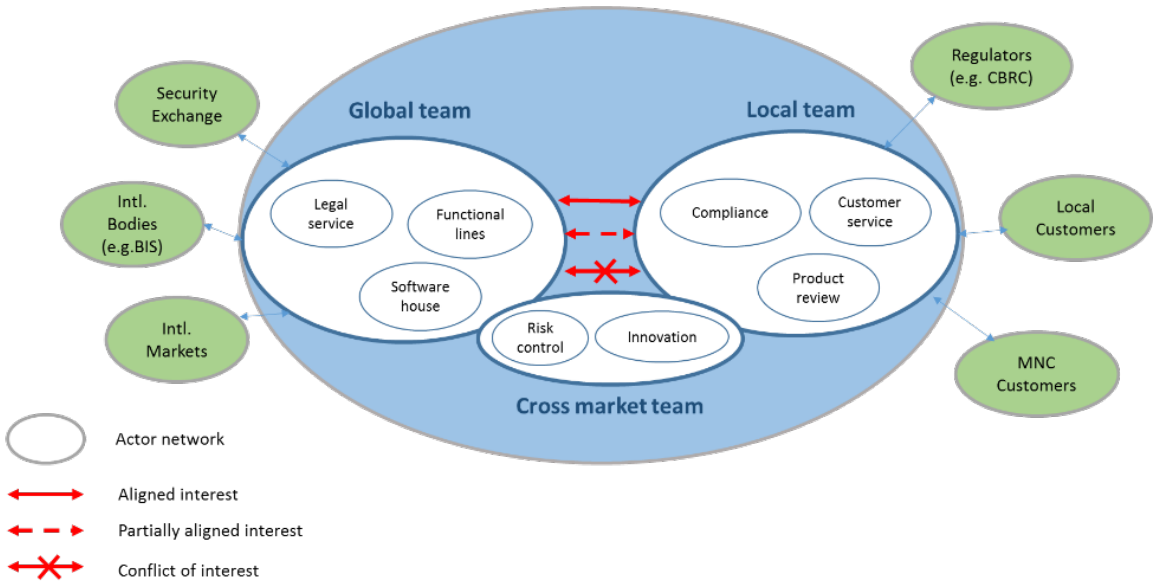

Figure 5-2: The actor-networked innovation model at HSBC

Source: Author analysis

There are three main groups of actors in HSBC's actor network. The domestic actors are local functional teams that constantly interact with the in-country regulators, business partners and consumers. They sense changes and trends in domestic markets, understand needs and channel innovation ideas or requests to the global actors. The global actors are central policy-makers and headquarter teams that continue to liaise with international regulatory bodies, security commissions and worldwide markets. They are responsible for transforming regulatory requirements into company policy, developing in-house best practices and initiating strategic innovation. The cross-market actors are IT, legal, risk, finance and product specialists who are subject matter experts in their own fields. They help the domestic actors' group to pre-screen innovation requests, give details of innovation specifications and support innovation development.

HSBC applies an actor-networked innovation model in managing its innovation. According

to Callon and Latour (1981), these networks can be potentially transient, existing in a constant making and re-making process. The networks of relationships are not intrinsically coherent and may indeed contain conflicts (such as regulatory dialectics).

In an actor networked environment, relationship supersedes formality. Therefore, it is important to ensure that actions conform to the interests of other clusters within the network. Involvement of different actors in the innovation process can greatly enhance innovation generalizability but also increase communication time and cost. To sum up, **innovation development at HSBC shows a dialectic model in which changes are the progressive outcomes of confrontation and conflict resolution among interested parties (Woo, 2017).**

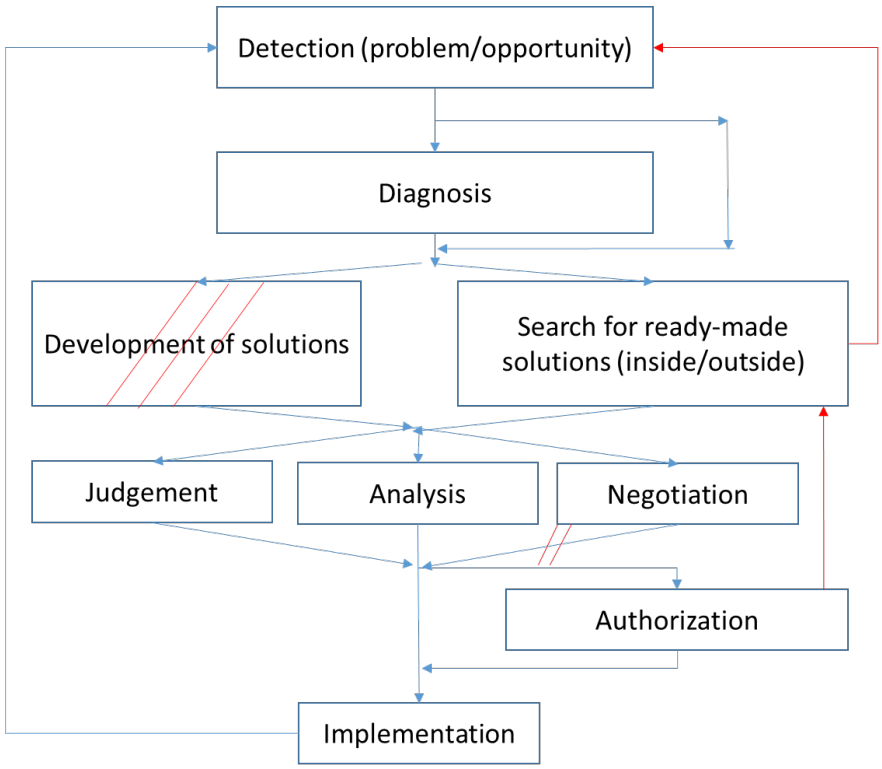

Figure 5-3: Innovation process: The "Behavioral" model

Source: Romelaer (2015)

Based on the empirical study, it seems that **HSBC is adopting an "actor-network" based "behavioral" innovation model.** Many parties (actors) are involved and interact in the complex situation (network) of financial innovation process at HSBC. The material-semiotic networks with multiple levels and different clusters (HQ, regional and domestic branches; functional, business and project units; regulator, customer, supplier and industry expert roles) come together to act as a whole. According to Callon and Latour (1981), these networks are potentially transient, existing in a constant making and re-making process. The networks of

relations are not intrinsically coherent, and may indeed contain conflicts (such as regulatory dialectics between innovation and regulation). In such a network-based environment, relationship supersede formality, unstructured intra-organizational behavior becomes important to ensure that executed/executable actions conform to the interest of other clusters within the network. Involvement of customers, regulators and front-liners in the early process of NSD such as product conceptual design and testing phases can greatly enhance the product quality and market acceptance. This is consistent with most current literature on innovation effectiveness. For example, Papastathopoulou *et al.* (2006) as well as Scheuing and Johnson (1989) concluded that the involvement of the marketing function was a key success factor throughout the entire process of new to the market innovation development. They further emphasized the importance of involving frontline personnel as well as operations staff throughout the process due to their essential role in service quality and knowledge of customers.

According to Mintzberg, Raisinghani, and Theoret (1976), "*Unstructured refers to decision processes that have not been encountered in quite the same form and for which no predetermined and explicit set of ordered responses exists in the organization"*. The actors' interactions and decisions are centered on the ultimate values and interests of the customers. Solutions are customer-centric and delivered through a service orientation architecture. The solutions can be ready-made or readily available inside or outside the organization. According to Romelaer (2015), some key advantages of this kind of innovation model are that the organization can possibly skip diagnosis to use readily available solutions (save time and money) and "store and reuse" the solutions in future (knowledge management). However, it requires "good judgment" through experience, learning and confrontation within the network. Also, the solutions shall be ready to interrupt and cycle-back for further development. The challenges are knowing what to do when some people have judgment and other people have analysis that contradicts the judgments; and using outside solutions too much can demotivate company employees, managers and engineers. Finally, this kind of innovation model is suitable for organization with the following characteristics: (1) large corporation with multiple actor clusters that work together for a coherent objective/mission; (2) open innovation environment to incorporate potential recyclable solutions from inside and outside the organization; and (3) effective conflict management to reinforce social relations to continuously avoid total-mechanism breakdown.

This actor-network and behavioral innovation model is suitable for HSBC and in alignment with its innovation strategy of "globally consistent and locally customized". HSBC has a "global innovation" model to centrally prioritize, develop and deploy financial innovation

products and processes. People in HSBC seek to establish a network of international connectivity and leverage on the global innovation development competency. Actions taken by multiple actors include implementing consistent business models, re-engineering global functions and processes, and streamlining the IT platform for financial product development. The local and regional actors are responsible for analyzing the local market needs and providing new product proposals for budget and development approval on a yearly basis. The HQ/centralized actors analyze the requests from all regions and categorize them according to predefined parameters. Cross-border actors include the technology development team in India and various product/risk/functional heads sitting in different parts of the world with diversified backgrounds, cultures, languages and expertise. This emphasizes the importance of collaboration and team work to the development of financial products that meet the unique needs of each distinct market. In addition, IT tools and project teams are developed to support and enhance the collective innovation efforts. Hence, it seems that HSBC relies on a mix of regionally coordinated and globally controlled innovation development resources, where actors' roles and behavior are important determination factors in the innovation process.

This chapter has presented and analyzed the findings of HSBC. It argues that HSBC pursues a "global template innovation strategy", which is supported by an innovation model of "actor-network" in general and a "behavioral-based" network. The innovation process at HSBC is characterized by global consistency, local adoptability, multidisciplinary team actions, mutual learning, leveraging and influencing. This model of innovation enhances product standardization and risk management, but it also increases rationalization costs when tailor-made solutions are required for local market adoption.

The next chapter will investigate the innovation process and model of a state-owned Chinese bank, China Construction Bank (CCB).

Chapter 6: CCB Case Study

China Construction Bank (CCB) was founded in the 1950s as a wholly state-owned bank under the direction of MOF of PRC to administer and disburse government funds for construction and infrastructure related projects under the state economic plan. In the 1970s, CCB became a financial institution under the direction of the State Council and gradually became a full-service commercial bank in the 1990s. CCB was subsequently listed on Shanghai Stock Exchange (2005) and Hong Kong Stock Exchange (2007). As at the end of 2019, the

market capitalization of the Bank exceeded USD 238 billion, ranking the fifth among all the listed banks in the world. With one of the largest networks of over 15,000 branch outlets in the Chinese Mainland, CCB serves 3.5 million corporate customers and 315 million personal customers, and maintains close relationships with leading enterprises in strategic sectors for the Chinese economy and numerous high-profile clients.

CCB's commercial banking business consists of three principal segments, namely, corporate banking, personal banking and treasury operations. It is among the market leaders in China for infrastructure loans, residential mortgage and bank cards. As one of the Big Four banks in China, CCB has established banking relationships with many of the largest business groups and leading companies in industries which are strategically important to China's economy. At the end of 2019, CCB had a network of over 15,000 branches and sub-branches in the Chinese Mainland, maintained more than 20 overseas branches in Hong Kong, Macau, Singapore, Frankfurt, Johannesburg, Tokyo, Osaka, Seoul, New York, Ho Chi Minh City, Sydney, Melbourne, Taipei, Luxembourg, Brisbane and Toronto.

CCB's business consists of three principal business segments:

- **Corporate banking**, which provides various financial products and services to corporations, government agencies and financial institutions, including corporate loans, trade financing, deposit taking, agency services, consulting and advisory services, cash management, remittance and settlement, custody and guarantee services;
- **Personal banking**, which provides financial products and services to individual customers, including personal loans, deposit taking, bank cards, personal wealth management, remittance and securities agency services; and
- **Treasury operations,** which manage its money market activities, consisting of inter-bank transactions and repurchase transactions; manage its investment portfolios, including securities held for both trading and investment purposes; and conduct trading on behalf of customers, including foreign currency and derivatives trading.

Based on the information obtained from interviews and written materials, CCB provides full-scope commercial banking services in China as well as limited loan and asset management services in overseas market. Bank services provided by CCB in China include E-banking service, personal loan, deposit, corporate, credit card, securities agent, fund settlement, credit business, intermediary business, international business, corporate term deposit and WMPs. Over 95% of the Group income is derived from the Chinese market, with the majority related to loan and deposit related businesses. Intermediary business income (handling fees and

commissions) constitutes 24% of the total income, ranking the highest among CCB outlets in China.

Why is it interesting to study CCB? Bourgeois (1985) pointed out that the environmental uncertainties, enterprise competence and resources matching have strong influences on a firm's performance. The environmental uncertainties include technology and market changes, reform of governmental laws and regulations, social transformation, client preferences changes, and the behavior of competitors. Inspired by Bourgeois' works, Wang (2009) performed an empirical study on China's listed companies' industrial upgrading process and found that high environmental complexities lead to slow and limited enterprise changes, while highly competitive environment leads to fast and substantial enterprise changes. In recent years (2015~2019), the Chinese financial service environment was experiencing significant policy liberalization and transparency (reduced environmental complexities) and the increased popularity of Internet financing and emerging new players (increased environmental competitiveness). Therefore, it is expected that the traditional Big Four banks need to accelerate their innovation and operation transformation process in order to fit in the new business environment.

China, the world's largest emerging and transitional economy, is well known for its state-owned banks dominating the banking system. The Big Four state-owned domestic banks reflect the mainstream banking practices in China. They control the majority of market share in China's banking sector and enjoy abundant resources. The general understanding is that these mega-sized and well-established domestic state-owned banks in China are rather conventional in carrying out business processes innovation and adapting to new technologies. They enjoyed a strong government protection from foreign competitors over a long period of time. With industry domination and market monopoly powers, they are risks-adverse, conservative and undertake significant social responsibilities entrusted by the government. They, therefore, follow the long-standing tradition in running the banking operations. Is this popular belief correct? Or it is just a misconception? China's banking industry has not been well understood since it has been protected and isolated. Therefore, understanding the innovation and change process of a Chinese domestic state-owned bank will help fill in the knowledge gaps in this domain.

China's domestic state-owned banks, like CCB, are actively engaging in product and service innovation activities in recent years. For example, CCB has invented a variety of WMPs and cash management solutions for retail banking. CCB is currently pushing forward product R&D in the special fields like micro-financing, supply chain finance and mobile banking.

Empirical materials in this chapter are based primarily on my previous cash pool implementation experiences with CCB Shanghai Branch, interactions with the financial industry analysts and practitioners, and interviews with participants from CCB HQ and provincial bank's product innovation and risk management team. In addition, publicity materials such as the bank's website, annual reports, shareholder presentations, newspapers, business magazines and academic journals were used as supplements.

The next section will present a detailed analysis of CCB's operations in China based on the framework of "environmental-strategy-performance".

6.1 Business Environment

CCB's key shareholder is Huijin (an investment arm of the Chinese Government), which had held about 60% of its shares by December 2019. Despite being state-controlled, CCB has the financial responsibility to all its shareholders as a public listed company. This creates the room and incentives for the Bank to operate for profit with less interference from China's central government. CCB is deemed as one of the most dynamic and innovative financial institutions in China. Because of its size, CCB continues to be one of the Big Four domestic SOCBs dominating China's banking sector.

Despite being partially privatized, the government continues to exert a strong influence on the lending practices and administration of state-owned banks via various means. First, the board of directors of the banks and the senior bank officers are generally directly appointed by the CPC Organization Department, and usually come from central government or Party agencies or one of the state-owned banks. For example, In November 2011, Wang Hongzhan, previously PBOC's deputy governor, was appointed CCB's chairman and Party secretary, replacing Guo Shuqing, who was appointed chairman of CSRC. Second, the career opportunities for senior bank officers largely depend on the assessments of the official agencies responsible for their appointment, which make them more responsive to the wishes of the central government than to the interests of the shareholders of the banks. Third, the central government agencies exert direct pressure on the bank officials to provide loans and services to specific projects or investments (Martin, 2012).

During the 2008 Financial Crisis, the government implemented economic stimulation measures by pumping credit into the market. The state-owned banks were "advised" to provide more loans to SMEs, rather than larger companies, as this would supposedly create more jobs

and responses to public criticism on "bank's financing bias". At the same time, CBRC reminded banks of the dangers of NPLs and cautioned the banks against offering credit to riskier companies. State-owned banks generally perceive SMEs as being of higher risks and more costly to assess risks than larger companies or SOEs. The state-owned banks need to strike a balance between profit optimization and economic policies stipulated by the State Council, PBOC, and other government entities. In general, the state-owned banks are keener to lend to their major clients—China's SOEs and larger private corporations—to assure repayment of loans and good relations with increasingly influential figures in China's political system. The central government at times may give indirect pressure to the banks to align their credit allocation along with national economic policies. China's banking system is also suspected to provide subsidized loans (lower interest rates) to preferred companies – usually SOEs – as part of a central government strategy to make Chinese companies more domestically or globally competitive. Based on an informal study, the average annual interest rate of SOEs was 1.6% while the annual rate for private companies was 5.4% (Martin, 2012). Based on my experience, these allegations are true to certain extent. SOEs are enjoying lower financing costs and better access to funding compared to SMEs. Some SOEs are exploring this favoritism by proving bridging loans to SMEs for financing rents.

State-owned banks are generally facing the following challenges (Ma and Sun, 2009):

- China's GDP growth rate dropped from 10% (2015) to 6% (2020). The risk of periodical economic fluctuations caused significant assets restructuring, which led to the commercial bank facing the possibility of worsening asset quality (such as property value).
- The profit gap of commercial banks in China squeezed due to interest liberalization and "finance to escape intermediary" implications from new forms of financing such as P2P lending.
- The opening of Chinese financial systems and entrance of foreign banks or strategic investors/alliances led to a new pattern of competition to "traditional monopoly power" of state-owned banks.
- Innovation capability and related risk management mechanisms of state-owned banks generally lagged behind foreign banks.
- As state-owned banks were engaged in more complicated banking products, the bank operational risk increased, calling for experienced talents to manage risks and performance. However, the remuneration and recruitment systems of state-owned banks were difficult to attract and retain talents.

How did CCB respond to these challenges? What business strategies were implemented by CCB to improve its core competence and competitiveness? These questions are addressed in the following section.

6.2 Business Strategy

CCB's vision is to pioneer always at the forefront of China's economic modernization and strive to be a world-class bank. It has a mission to provide better services to customers, create higher value to shareholders, build up a broader career path for its associates and assume full responsibilities as a corporate citizen. With core values of "Integrity, Impartiality, Prudence and Creation", CCB has developed four concepts to guide is operation model/practice. Specifically, (1) the of market-oriented and customer-centric business concept; (2) the service concept of putting customer first and focusing on details; (3) the risk concept of knowing the customers, understanding the market, involving all associates and focusing on top priorities; and (4) the talent concept of emphasizing on comprehensive talent and focusing on business performance. Based on the information obtained from interviews and on-site observations, its style of work is generally diligent and disciplined, seeking truth and reality. Some of the slogans CCB adopted include "Builds a modern lifestyle"; "Progress with our customers"; "Prosper with the society"; "Continuous innovation in pursuit of excellence"; and "Excellence pursuer, prevail forever".

Based on the performance analysis announcement made on its website, CCB realigned its business strategies in accordance with the policy changes and development in China, including the "New Normal"; "the Belt and Road Initiative; and "deeper restructuring of banking practices". As China's economy entered the phase of the "new normal", change in development models and the acceleration of structural reform have become the "keynote" in the operation of China's economy. In 2019, amidst complex economic conditions in domestic and overseas markets, and the increasingly fierce competition in the industry and across sectors, CCB continued operating in line with the requirements placed on its capabilities to serve the development of the national economy, prevent financial risks, and participate in international competition. CCB devised a strategy to deepen reform and accelerate transformational development to become a bank with comprehensive services at group level, one that offers multifunctional services, runs with intensive operations and leads in innovation (Smart Bank). The Bank is committed to building capabilities to create value, solidify market position and become a leader in core indicators.

To support China's development strategy and credit restructuring in the country, CCB continued to prioritize its support of the country's development strategy, actively participate in the implementation of national development strategies including the "Belt and Road" initiative, building of Free Trade Zones, coordinating development of the Beijing-Tianjin-Hebei Region, and developing advanced and international banking practices to support the development of the Yangtze River Economic Zone. In 2019, CCB took full advantage of its traditional strengths, achieved an incremental growth in infrastructure and construction loans of more than USD 45 trillion, accounting for 75.25% of loan increments to finance national key projects, urbanization and new-rural construction. Meanwhile, CCB continued its leadership in residential finance, recording over USD 0.4 trillion in balance of residential mortgages, ranking first in both volume and incremental increase among peers and accounting for over 50% of market share in residential-related reform services.

CCB also actively expanded its financial services to MSEs, stepped up the promotion of new operation models, and improved service for MSEs with tailor-made products that were developed through big data information technology such as "Shan Rong Dai" (rolling facilities) and "Jie Suan Tong" (settlement). The Bank explored new models in rural financial services, continued to increase the number of outlets in township and counties, strengthened cross-sector cooperation with purchasing cooperatives and other relevant rural companies and institutions, and promoted and expanded a plethora of service channels including mobile banking, ATMs and sales terminals. In areas that needed reform and restructuring, such as local government financing platforms, the real estate sector and industries with excess capacity, CCB carefully controlled loans granted to industries with excess capacity and those regulated by regulatory policies. As a result, loans to five industries with severe overcapacity, including steel, cement, electrolytic aluminum, flat glass and shipping, shrank by USD 0.5 billion compared with the beginning of the year, and loans to local government financing platforms decreased by USD 4.8 billion compared with the previous year.

Overall, CCB's overall business strategy is policy-support and socially responsible. This is consistent with CCB's formation objective of financing large infrastructure projects to support the country's economic development. Being one of the largest employers in the country, with total headcount of 360,000 at end of 2019, CCB assumes a social responsibility to ensure employment as well as financial and economic stability. As a result, the business strategy and performance may not be fully "profit maximization-oriented", although it is a public listed company. Instead, it continued to expand financing in accordance with the "policy direction" and gradually developed its innovation capability in product and services development to meet

the new business landscape requirements. A detailed analysis of CCB's business and innovation performance is presented below.

6.3 Business and Innovation Performance

The analysis of CCB's performance is divided into two parts, namely, business performance and innovation performance. The first part of performance analysis focuses on the financial and operational performance of CCB in China specifically, and the second part of performance analysis focuses on the product, process and business model innovation of CCB in China. The analysis timeframe was from 2014 to 2019, generally based on information extracted from annual reports, corporate announcement on its website, and interviews with CCB personnel, industry practitioners and analysts.

At the end of December 2019, CCB's total assets reached USD 3.6 trillion (RMB 25 trillion), and recorded a net profit of USD 37 billion (RMB 260 billion). The Bank's return on average assets and return on average equity were 1.42% and 19.74%, respectively. The net interest margin (NIM) was 2.80%, the total capital adequacy ratio (CAR) 14.87% and the core tier-one capital adequacy ratio 12.12%. Due to the strong business performance of financial assets which increased by 34.30% and that of the net profit which increased by 31.63%, the Board recommended a cash dividend of RMB 0.306 per share for 2019.

For service innovation, CCB accepted intellectual property rights and shares of non-listed companies as collateral for loans extended to technology enterprises for the first time. Targeting corporate clients and public institutions, CCB provided value-added services such as custody consultancy, account information management and pension card through its financial product "Yangyiwuyou". The Bank also launched the first supplementary medical insurance integrated management product among large-scale SOCBs in China.

For product innovation, followed with the development direction of "Intelligent, Ubiquitous and Cross-industry", CCB launched its FinTech strategy in full measure, and endeavored to seize the height of FinTech. Firstly, the Bank built three channels of e-banking, including online banking, mobile banking and WeChat banking. As a result, the level of application of CCB's electronic channels further improved. Electronic banking and self-service channels accounted for 88.03% of total transaction volume, representing an increase of 2.63% compared to the year before. Online banking customers reached 182 million, up by 19.10%.

Mobile banking customers grew to 147 million, up by 25.98%. WeChat banking customers surged to 14 million.

Secondly, two major platforms devoted to serving everyday needs, "E.C-Bank.com" and "Joy Life", achieved strong development. As the first among peers to have launched the e-commerce platform "E.C-Bank.com", CCB proactively carried out the platform strategy to promote financing through commerce. Meanwhile, "Joy Life", a platform developed to offer convenience and ease of mind to daily lives, became CCB's brand in this regard after three years of growth. "Joy Life" platform had over 4,000 payment items, covering more than 300 cities, amounting to 230 million transactions and approximately USD 6 billion in transaction value.

Thirdly, the Bank continued to enhance its three pillar product lines in FinTech covering payment, investment and wealth management, and credit financing. CCB led the market share among peers in primary payment tenants, such as Alipay and railway tickets (through 12306), and transaction volume recorded USD 20.1 billion. Further, 70% of WMPs, 60% of funds, and close to 100% of precious metal accounts were sold through internet channels. The Bank further raced to launch the internet loan business, with a series of products including "e-Loan Platform" and "Express Loan", which were based on online credit scores and transaction records, and "Fast Loan", which was fully operated online.

Fourthly, the Bank made effective use of intelligent technology applications. By initiating and implementing the top-level design of big data mining, and building corporate data models, the Bank realized the centralized management and governance of data and provided precise services for all businesses utilizing the data asset. Further, the Bank led the market to implement "the cloud of finance" in workplace, and increased agility in business handling. The Bank also deployed intelligent robots for automated customer services, rendering higher volume of automatic response than that of manual telephonic response in the year. The volume of intelligent and automated customer service totaled 75.75 million in person. Like many other LCBs, CCB also embarked on the road of FinTech development to connect its offline operations (branch and ATMs) and online FinTech (E-banking and Mobile banking). However, its aspiration of FinTech will not be an easy journey. "*Insufficient innovation, mutual replication, product homogenization and other problems exist in the integration of commercial banks and the internet, thus the banks are required to be proactive in innovation based on risk control",* said a financial analyst.

6.4 CCB: Aspects Related to Research Questions

This section tries to answer the research questions raised in the first chapter of this thesis. Data in this section are primarily based on interviews with officers from CCB. To make the interview discussion more specific and concrete, the interviewees were asked to share specific examples from their business functions. Therefore, materials presented in this section refer to innovation in Cash Management Solution. The interviewees were from Product Development (Product), Sales and Marketing (Sales), Innovation Management (Innovation), CRM and Risk Management (Risk) departments. In addition, written materials (when existent) and observations were used as supplements.

A small workshop was conducted at CCB's Shanghai provincial bank. The workshop was led by the author, guided by the interview guideline which was provided to the workshop participants two weeks before the discussion. In total, six people (excluding the author) participated in the workshop discussion. One of the workshop participants was senior VP from Transaction Banking Division at HQ and the rest were leaders and managers from the provincial branch. The Transaction Banking division consisted of corporate treasury settlement and customer service (front-end), NPD (middle) and risk management & internal control supervision for daily operations at branches (back-end). Key product of Transaction Banking was Cash Management solutions, namely, corporate cash pool. The HQ officer was responsible for NPD and sales & marketing support. The provincial branch representatives were officers and managers from Sales, Innovation, CRM and Risk departments who were responsible for supporting the development of CMS at HQ and implementation of CMS among customers.

6.4.1 Financial Innovation Process

Using CMS product development as an example, the workshop participants described the innovation process. The first step is to **collect market or new product requirements**. The new product ideas or requirements are collected from several sources (1) Suggestion from front line operators based on their daily interactions with customers and observations of changes in the customer or market demand. This may include comparisons with competitors' new products, issues with existing products and what customer frequently ask for or suggest); (2) Feedback from key customers based on their user experience with the current products and also what new banking solutions are needed for their business development (for example, when a key customer

expands its operations to overseas and demands more flexible cash management solutions (cross-border cash pool) to meet short-term working capital needs in overseas branches); (3) regulatory changes may create new demand of certain banking products (For example, the government is promoting the internationalization of Renminbi as a global settlement currency. In this regard, the regulator is "relaxing" control over remittance of Renminbi overseas. As a result, new banking products such as overseas intragroup loan has emerged to enable the holding company to lend out loans to its overseas subsidiaries provided that they meet certain criteria stipulated by the regulator (positive cash flow, net profit and net assets).

After collecting the market requirements, the product team will **conceptualize the ideas and design the new product features and working mechanism**. In the product design stage, HQ will form a NPD team from key members in HQ (cross departments), which includes key members from selected branches. The inclusion of members from branches in the product team is very important for several reasons. (1) branch members are close to customers, so they know what exactly customers want and what will work or will not work, (2) they will be responsible for selling and marketing new products. Their early involvement will help them understand the new products better and help launch the products to the market more successfully in the later stages.

Next, the product team needs to **coordinate resources and align understanding / ideas internally for the development**. That will include people from IT, risk & compliance, and operations. During the conceptual design stage, it is important to review the security, risk and control of the new product to ensure it complies with the bank's internal policy. After that, it moves to product development stage with IT. In this stage, the IT / product specification is developed, coded, tested (with branch member to co-develop the test case and involve in the testing), modified, retested and finalized. Concurrent to the development stage, the product team begins to develop the new product operation manual (for customer/user and bank employee/administrator) and management policy (target customer group, process map, implementation condition and evaluation criteria). Then, the IT / product specification is finalized, and implementation manual or policy are ready.

The final step is **new product launch where HQ will inform all branches in the form of an announcement of the new product features, who and how to sell, and operation guidelines. The final step is new product selling**. Customer representatives and front-line members from branches approach the target customer group and promote the new products. The new product launch strategy very much depends on the new product itself. If it is a general & simple product (such as new debit card & remittance), the Bank will make it simple to

understand and promote by sales staff at branch outlet. This will include some brochure development, training to sales staff and KPIs to encourage promotion. For more complicated & sophisticated products (such as cash pool), the branch outlet sales staff may have limited ability to interact with key customers. In this case, the Bank relies on product and customer managers to promote the new products. Therefore, it is important to have product managers from branches to participate in the new product design stage & process and relevant trainings.

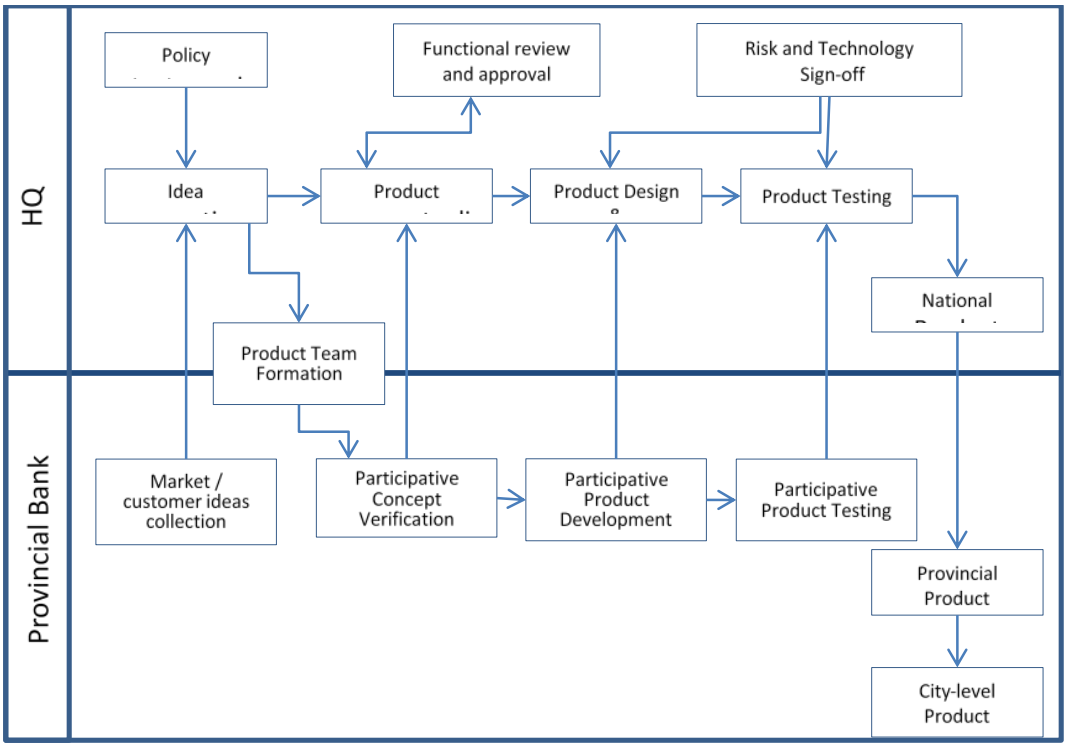

Figure 6-1: Financial innovation process at CCB

Source: Author's analysis

How is the product design improved? The Product officer answered that the product design is based on **customer demand/requests collected and regulators' rules and policy**. Besides these, the product team also needs to **assess the future market changes and demands on the new product.** For example, can the new product be flexible to other industry or customer group? To make it flexible and sustainable (for some periods before market / regulatory conditions change), what additional features / functionalities can be included in the current product design / development? The **IT team also provides good input / suggestions in product design**. For example, the IT team will analyze the current new product design in terms of limitations, how to make the product features and logics more secure and flexible, how to improve the user experience and the bank's control of risk and product performance. Once the product design is confirmed, the product team will not make any major changes anymore. Any further modifications will be included in the next phase of product upgrading. If there are major

changes in the current product design, it suggests that the product is not ready to develop or the interactions with IT, risk and control are not adequate. In such cases, the product team needs to revisit the new product business case and application process. In the testing stage, there are some minor adjustments, but generally these do not affect the products' key features and design.

Financial innovation has the characteristic of "homogeneity". Any new financial innovation product in the market is easy to be copied and varied (through small enhancements). Banks copy from each other and follow the continuous improvement process to make new products more robust, user-oriented and risk resistant. In such cases, **the game plan is not to launch a "unique" product, but to quickly identify market needs/changes (customer, competitor and regulator) and adapt to a continuous innovation process**. The Product officer said, *"To explain this, if we are the 'follower', we will focus on the enhancement of the product features of the existing competitor products. If we are the 'innovator', we will focus on the sustainability and ongoing development/enhancement of the product. The futuristic, flexibility and continuous innovation ability of the new product will determine if we can keep ahead and set ourselves apart from our competitors. The advanced and innovative product features will help us gain comparative advantages in the market, plus good reputation in customer relationship management."*

KPIs are the responsibilities of the sales team and marketing expenses are allocated to the new product launch. A sales officer said, *"As you can see, foreign banks have very good marketing support for fancy presentations and attractive toolkits. We, domestic commercial banks, lack sales tools and support to Sales and Marketing."* To improve sales performance, Product manager will go to key target customers with the help of customer managers. Perhaps, **compared to foreign banks, Chinese banks need to improve the sales tools and support provided to product managers**.

When the workshop participants were asked to share **an example of failed NPD**, the Product officer said that *"We once developed a product based on regulatory requirements. The policy required companies selling prepayment cards (customer deposit money in the card and withdraw later) to maintain a certain amount (20~40%) of their card selling income as deposit with the banks. This was to protect consumer interest if the companies closed its business or was unable to fulfill the financial promise later. However, the new product was not successful; the deposit collected was low compared to the initial target. There was nothing wrong with the product features or concept. The problem was that a lot of companies did not keep the money in bank or did not register the 'prepayment deposit accounts' with the regulator. Due to the lack of regulatory enforcement, the product was not well promoted in the market. Of course, when*

major issues happen, such as run-away deposits, the regulator will enforce the requirements of registration and deposit. Then, the product will be accepted by the market." Therefore, **many factors can lead to product failure, one of which is regulatory changes or lack of regulatory enforcement.**

When asked about **innovation** at CCB, the Innovation officer said that the launch of **"Shanghai Pilot Free Trade Zone" and "internalization of Renminbi"** added new forces to the innovation needs and progress of Chinese banks. **Cross-border cash pool** was something that CCB was working on. The conditions and challenges were to develop a mechanism that could ensure effective coordination and interface between different regulatory frameworks imposed by different countries or legal systems. Foreign international banks have comparative advantages in this regard, as they have already been into the international banking business for many years, while Chinese banks only started setting up overseas branches a few years ago. Therefore, many lessons need to be learnt and operation protocols developed for Chinese banks to become truly "international". CCB has been continuing to recruit talents from foreign international banks to improve capability in this area.

HQ officer further commented that, as to the innovation process, HQ is working closely with branches to collect customer demand, ideas and feedback. The Bank also engaged external consulting (such as AT Kearney) to help develop the cash pool product framework. However, **the internal mechanisms of a bank (bureaucracy) can sometimes constrain the innovation capability of the bank**. This is a common obstacle to domestic Big Four banks and only a complete reorganization, process reengineering and establishment of managerial incentive systems can eliminate the barriers in cross-organization and cross-department communication.

Cash Management Solution (CMS) was already upgraded to the Bank's strategic importance level. Product officer commented, *"We need more cross-departmental & cross-location coordination to ensure a smooth end-to-end innovation and transformation process. All banks (Chinese or Foreign) are facing limitations in resources, especially IT. A lot of NPD depends on IT capability and availability. We have a long queue of new products and enhancement requests in the IT development pipeline. Also, we need to improve the innovation process and mechanism, such as marketing tools and support to the product team.*"

When asked about what challenges CCB was facing in NPD, the Innovation officer said that there were many new non-traditional banks in the market such as the Internet, media, telecom and third-party payment firms providing "financial services", yet they were not subject to the same level of scrutiny by the regulatory framework. They are more innovative and

responsive to market demands while being less regulated. The inconsistent regulatory framework has resulted in the differences in the risk tolerance level. These **Internet financial service providers are more risk-taking in new product launch. The regulatory control and penalties are less severe compare to the revenue opportunities in the market.** In comparison, traditional banks are more risk-adverse or conservative when dealing with uncertainties in new product ideas and launching. **Generally, each department adds on control requirements to the new products (in the new product approval process). This makes the new product lose some flexibility in the original product design, with the additional control requirements.** Perhaps, we should explore new mechanisms, such as new product insurance, to prevent risks (consequential lost) and yet provide adequate flexibility to the NPD process. CCB has a standard NPD policy and procedure. All NPD basically follows the same process.

Further analysis

The Bank's innovation process is generally **a gradual enhancement process (add-on method) that aligns with the regulatory reform objectives.** It is a government policy-supported innovation generation model. In some cases, innovation may not be always justifiable economic and business wise, but it supports certain government agenda such as financial inclusion and financing for rural areas and farmers. Therefore, **the innovation process at CCB follows a top-down approach, where innovation ideas are developed at HQ and "proof of concept" at the provincial bank level. Such a model reinforces the HQ's control over the innovation roadmap and process.**

Although **customer / market demand information is also collected through provincial banks, provincial banks are typically not involved in the product conceptual design and development process.** The final innovation output can be very different from the initial product proposals from the provincial banks. This may lead to innovation diffusion difficulties and lack of buy-in from the provincial banks. To manage risks and compliance, the product experienced multiple rounds of control add-on during the new product review and approval process. The **innovation, sometimes, ends up as "an ideal product to the bank" but may be "a less user-friendly bank product to end users".**

Innovation process at CCB also shows **a "layered" model.** On the **upper layer is the HQ bank or central team, who is responsible for the end-to-end innovation development process, from idea generation to national launch**. On the **lower layer is the selected provincial banks or the participative team, who contributes to the innovation process on a called-basis and is responsible for innovation diffusion to customers and lower levels**.

Such a model helps ensure product consistency with bank standards and government policies, but it may lack market insight and competitiveness.

The **provincial banks may initiate domestic-specific product innovations based on general guidelines and authorities provided by the HQ ban**k. Such provincial and city level product innovations are generally meant to support provincial and city government policies. For example, specific loan products are developed based on specific criteria to resolve domestic economic issues or to local government policy implementation. These lower layer innovations are restricted to the master product lines established by the HQ bank and must be reported to the responsible division and product innovation department at HQ bank for approval.

6.4.2 Regulatory Dialectics Reconciliation

What were the various changes of regulation over the past 4 or 5 years? How did CCB respond to these changes? The implementation of Basel III and conservative policies on deposit/financing by federal bank resulted in the development of intermediate banking products (such as cash pool) which did not require capital reserve. Also, the globalization of RMB and cross-border currency exchange also promoted the development of more sophisticated cash pool products such as cross-border pool, multi-currency pool, and overseas intragroup loan. Therefore**, the development in regulation in the last few years had positive influences on the bank's business. The liberalization of interest rates also led to reduction in bank profits from traditional banking businesses**. Therefore, banks were required to innovate and change in order to meet the shareholder and market expectations by developing and engaging in more intermediate and innovative banking service and product offering.

How was CCB informed of the regulatory changes? How did these regulatory changes affect CCB's innovation and change process? The Bank obtained information about regulatory changes from several sources: (1) open / public information based on announcements from regulator, (2) discussions between the risk team and regulator during the new regulation consultative process, (3) informal channels (friends' network/social media) for new policy speculation. The product team needed to reevaluate/consider the impacts of new regulation on the innovation project by adjusting some parameters of the product.

What were CCB's innovation and change strategies in a regulated and constrained environment? The regulatory framework in China, except for currency control, was generally liberal, as the regulator allowed some internet banking model to innovate and launch new

products to the market. CCB's innovation strategy was (1) define its market proposition (2) identify the market segments and target groups (3) innovate based on the market needs/demands.

How did CCB make use of these opportunities to adjust/innovate to enhance bank's competitive advantage? The Big Four banks always benchmark each other. An innovative product will set a bank apart for comparative advantages in the market. Financial innovation product is homogenous and easy to copy. Most banks replicate and enhance the product from each other. The key is customer relations and the ability to generate market volume.

The Chinese regulatory framework is "managed by line", as we have different regulatory body overseeing each financial service line. Also, the development of "mega" bank is a new trend in China whereby traditional banks are consolidating financial offering (insurance, investment, guarantee and leasing) into conglomerate financial hubs or venturing into new areas of business such as e-commerce. CBIRC was established in April 2018 by a merger of China's banking and insurance regulators, namely, CBRC and CIRC. CBRIC is responsible for supervising the establishment and ongoing business activities of banking and insurance institutions and taking enforcement actions against regulatory violations

How does CCB see and describe the regulatory environment in China? What are the differences compared to more mature financial regulatory framework? The regulation in China is strict and strongly enforced. Most banks comply with the regulatory guidelines. Even sometimes asked by customers for services in some "grey areas", the bank is cautious to the risk and the regulatory implications/reputation damage. As a SOE bank, CCB does need to carry some social responsibilities in its traditional banking operations.

How does CCB reconcile the dialectics between financial innovation and regulation? In general, whenever there is a conflict between compliance and innovation, compliance always prevails. Policy support is a lubricant to smooth out the dialectic, whereby innovation needs to be "backed up" by government policies. The next section will review how financial innovation capabilities are being managed, appraised and developed at CCB.

6.4.3 Financial Innovation Management

The discussion of **CCB's innovation management system** focused on the **innovation organization and mechanism**. According to the workshop participants, CCB Group had been vigorously promoting innovations in products, processes, technologies, business model and

reform of systems and mechanisms. With respect to management innovation, the Group put great emphasis on the "number of effective customers" instead of the "number of new customers" in internal performance assessment. As to product innovation, the Group set up a specialized department at HQ and provincial bank levels to be responsible for the planning, invention and promotion of new financial products.

On the philosophy of **"innovation drives development",** the Bank continuously enhanced its product innovation capability and strived to build itself as an **innovative bank**. In 2013, the Bank set up the **Product Innovation and Management Department**. The department worked out the first specialized plans for product innovation, enabling the leapfrog growth of innovation projects and dramatic boost of innovation enthusiasm. Innovative products were created in various business fields. The number of finished product innovation projects exceeded 960 in 2013, up by 176.15% over the previous year. At the end of 2013, the number of the Bank's self-owned products and agent products for third parties within the products lifecycle duration approached 7,000, forming a complete product system covering 12 major business lines including deposits, credits, trade finance, credit card, investment and wealth management, payment and settlement, agency business, electronic banking, custodial and supervisory service, investment banking, financial markets and customer assets management. The Bank became one of the most innovative domestic commercial banks with a wide range of financial products and comprehensive categories of services.

In 2013, to provide consumers with better service and protect their rights and interests, CCB established organizational and managerial systems for financial innovation and approval. The **Product Planning and Innovation Committee at Board level** in CCB was in charge of arrangement and coordination, and competent departments were appointed for specified centralized management, with the help of a specialist team which concretely organized and carried out related work. CCB also established **Opinions on Completing the Work of Consumer Rights and Interests Protection**, which specified the aim, framework and major measures of the work of consumer rights and interest protection. Meanwhile, each **tier-one branch had a specialized institution for the work of consumer rights and interest protection** to ensure the implementation of details.

CCB also comprehensively carried out publicity, **training and education** on the consumer rights and interest protection, and constantly strengthened the protection on personal financial information of consumers. Using a **process-oriented approach to innovation management and control**, CCB strengthened the protection of consumer rights and interests in areas closely related to consumers, including wealth management, credit card and electronic banking

businesses, throughout the whole selling process from pre-sale, sale to post-sale. In addition, CCB had set up a multi-channel complaint management system, consolidating networks of telephone banking, on-line banking and operating outlets, along with a peer-leading supervision and evaluation system of customer service quality, contributing to the constant improvement in the Bank's service capacity and quality.

The Group also reinforced the **technological** support and speeded up the development of the new generation core banking system **to facilitate innovation development.** Since the initiation of Phase I of the new generation core banking system in October 2012, 13 application projects, and two infrastructure projects and the new generation IT framework, platforms, technologies and security components for supporting the operation of applications, had been successfully put into operation, gradually manifesting its business values and innovation power.

"Adhering to the innovation development strategy featuring "integration, multifunction and intensiveness", the Group continued accelerating the development of innovation and strategic transformation, continued to fully support and serve the real economy, stick to sound development and stringently hold the bottom line in preventing risks, thereby constantly endeavoring to enhance its capability in value creation and innovation for consumer benefits", said the Innovation officer.

With a **focus on serving the real economy and people's livelihood sectors,** the Bank accelerated its product innovation in the financial market, pension fund management, investment custody and other emerging businesses, built and enriched the product system in relevant businesses. It strengthened product innovation related to urbanization, MSEs and personal high-end customers, and launched innovative products including scorecards credit mode for MSEs, and loans for marine economy and urbanization. It also provided services for overseas study, immigration and credit cards of personal high-end customers, and domestic and overseas collaborative services for them.

The constant innovation satisfied the diversified financial needs of customers, and therefore the ability to identify, shortlist and prioritize innovation ideas was important for innovation planning and management. The Bank designed comprehensive solutions for customers from multiple industries including road and highway traffic, information technology manufacturing, pension fund, as well as various institutional customers, small enterprises and private banking customers. By **strengthening collaboration with branches and subsidiaries** and timely launching several investment banking products and customized products, the Bank's comprehensive service capabilities were enhanced. The **innovation promoted consolidation**

and integration of products. The Bank developed a cash management system for personal customers and refined the cash management system for enterprise customers. In addition, it launched products for loan management services, and introduced several personal credit products based on "e.ccb.com' while continuously improving its functions and services. The Bank continuously introduced special offers via "Student Benefit" based on the characteristics of the student demographics. All these led to the constant improvement in different service platforms for diversified customers.

The **innovation accelerated the application of technologies.** Applications of new technologies in the Bank speeded up. The Bank launched and refined products with emerging technologies at a rapid pace, including the peer-leading digital-display credit card, NFC-SIM card for mobile phones, financial IC card with new functions, and WeChat banking, intensifying the applications of innovation in new technologies and mobile finance. The deployment of products in electronic channels accelerated, and customer experience constantly improved.

When asked about the assessment of innovation success, the Innovation officer said, *"To evaluate the new product success, we can refer to the impacts of direct income (fees from the new product); indirect income (deposit generated and new customer accounts created from the launch of the new product); and customer loyalty (breakthrough new target customer group and new "window or opportunity" to launch more services to existing customer groups)."* In short, the assessments of innovation implications were on both "monetary quantitative terms" such as direct and indirect revenue and/or income, and "non-monetary quantitative terms" such as new customers and new services provided. Qualitative assessment was targeted at the creative ideas, new product or service functionalities, market reputation and other indirect benefits to the Bank.

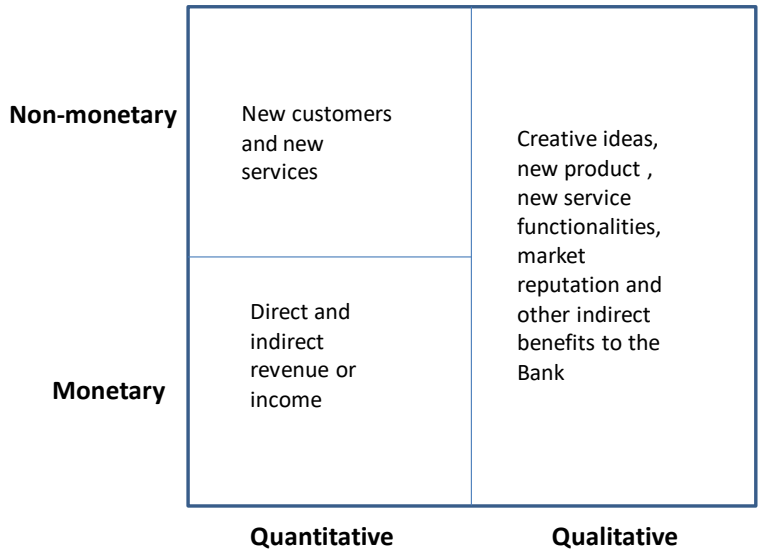

Figure 6-2: Innovation performance assessment at CCB

CCB also worked with FinTech startups to institutionalize its financial innovation. For example, in 2014, CCB became one of the **sponsors and coaches in the "FinTech Innovation Lab Asia-Pacific"** program. The program was initiated by Accenture and participated by a group of ten leading financial institutions in the world, to search and help fertilize the region's top financial technology innovators. Selected companies participated in a 12-week program that helped early- and growth-stage financial technology innovators accelerate product development and gain exposure to top-level financial industry executives. Senior executives from the ten leading financial service firms (including CCB) selected the winning applicants and provided mentoring to new financial technology entrepreneurs. These entrepreneurs were engaged in developing potentially game-changing technologies for financial services – particularly in the areas of Big Data and analytics, mobile and wireless payments, risk management, security, compliance, and social media and collaboration technologies. Most of the participants in the inaugural program had gone on to sign deals with banks and collectively they had raised $10 million in financing. The Innovation officer said, "*We recognize that innovation is the way forward for the industry and it plays a key part in the growth journey of the bank, which is committed to keeping on enhancing customer experience and bringing added values to our client.*"

The HQ officer referred to the August 2014 announcement of the Bank's interim result, and said that CCB had been accelerating strategic transformation and continuing to improve innovation capability since 2010. For example, following the **capital injection into Shanghai Liangmao Futures, CCB's non-banking business was extended to cover commodity futures and financial futures**, contributing to a leading integrated operational platform among its peers. The Bank pushed forward the development of an integrated platform of its outlets. The Bank had 13,100 integrated outlets and 13,500 integrated marketing teams. The percentage of integrated tellers rose to 73%. **Some of the branches had actively initiated the transformation of functional outlets into intelligent outlets.** The Bank further **implemented the separation of front and back offices, as well as the centralized processing at its headquarter for 28 types of real-time OTC products and services across all outlets**.

The Product officer commented that CCB's innovation capability was good, especially in CMS (cash pool) product innovation. However, most **SOE banks lacked sales support (tools & team), product packing, customer care and internal coordination across branches / departments compared to international banks**. These were the areas CCB needed to learn from foreign banks and develop relevant competencies to serve its clients. "*For innovation*

capability development, SOE banks shall continue ***to enhance their IT capabilities and improve market service*** *mindset.* ***IT is important as the 'designer' and 'executor' of NPD****"*, the Sales officer added.

HQ officer said that the Bank continued to invest in recruiting talents in enhancing its overall capabilities in the domestic and overseas markets. *"Chinese banks expanding overseas would mean a larger volume of international job mobility for high-potential talents. Currently, it is rare to see any local bank having talents with overseas experience in developed markets. CCB has already been consistently assigning our youngest and brightest professionals to subsidiaries overseas. For example, recently we have assigned a few talents from our international banking divisions to subsidiaries in Australia, US and France. Apart from the requisite experience (products, systems and regulation) and business acumen, the candidates also need to be able to assimilate quickly to a new country. Bilingual language skills are another plus. At the same time, we are recruiting talents from foreign banks with strong local business connections. We are attracting overseas talents provided there is a fit in strategy, culture and compensation packages. However, given equal capabilities, we are more likely to tap our own talents cultivated from management trainee days.*"

6.5 Summary: A "Layered Responsible" Innovation Process

Based on the empirical study at CCB, a "**Layered Responsible Innovation Process**" is suggested as the way in which financial innovation and regulatory compliance is reconciled in CCB.

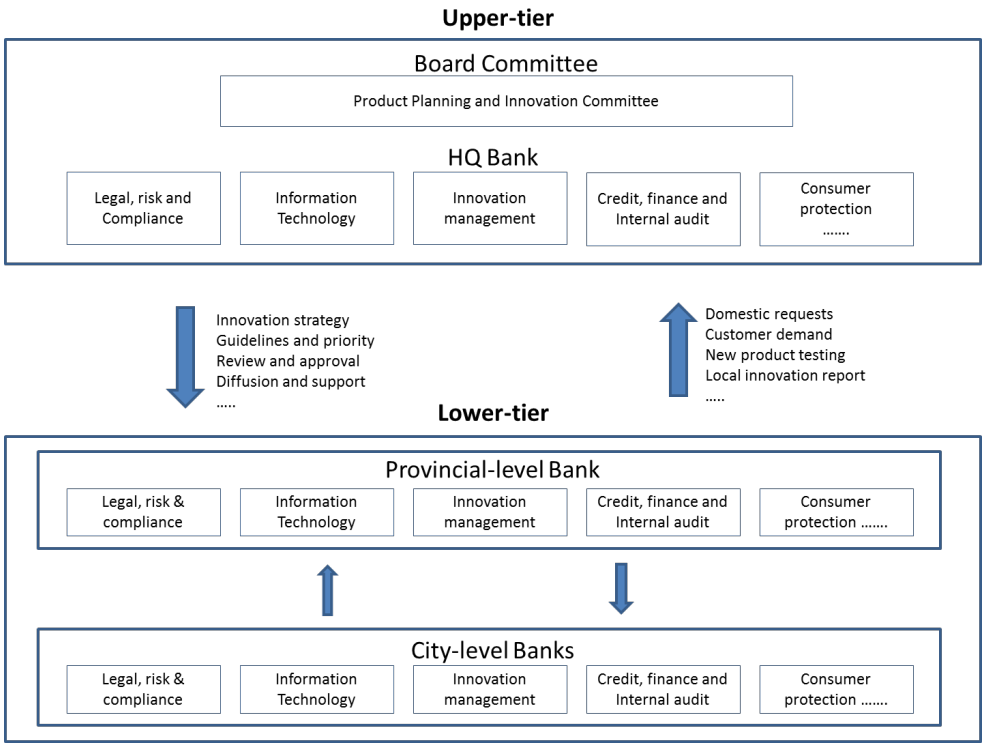

Figure 6-3: "Layered approach with vertical communications" (macro level)

Source: Author's analysis

At the macro level, there are two layers of actors involved and interacting in vertical financial innovation process at CCB. The top-down innovation process is described as the planned coordination of intentions and actions to achieve specific outcomes imposed by a central authority (Kim and Arnold, 1996). The upper-layer management specifies its long-term innovation goals, intentions and roadmaps prior to actions and translates the development plan into collective actions with a minimum of discretion (Burgelman and Grove, 2007). As remarked by Mintzberg and Waters (1985), no action transpires in the total absence of intention. Upper-layer management may offer some broad direction yet refrains from specifying detailed actions for every operational decision in the cascade of organizational hierarchy. In this context, the middle or lower-layer management can autonomously undertake specific actions that will serve the domestic needs. Slack and Lewis (2011) described this process as "*objectives and actions, at least partly by the knowledge it gains from its day-to-day activities*".

At CCB, the upper layer represents the board committees and the product R&D team at headquarters (HQ) that are responsible for interpreting government policies, establishing an innovation roadmap, overseeing innovation development and allocating innovation resources. The lower layer represents provincial banks and team members who participate in the innovation process on a selective basis and are responsible for providing market insights and

testing products before launch. Their involvement helps validate the product conceptual design in the early stage of development and allows the R&D team to hear the voice of customers. Strategic and nationwide innovations (related to regulatory changes and international banking) are initiated and constructed at HQ. Provincial and municipal banks may also engage in innovation activities based on guidelines from HQ. These innovations are generally developed to support the municipal government's domestic economy and financial policy. They are, however, confined by the existing product category and approval from HQ.

There are two types of innovation communication at CCB. In the top-down communication flow, long-term innovation goals, intentions and roadmaps are translated into operation goals and communicated down to drive collective actions with a minimum of discretion (Burgelman and Grove, 2007). Messages from the top provide broad direction. Lower-layer staff autonomously undertake specific actions that serve domestic needs. Bottom-up communication is upward reporting and innovation ideation: collecting information on market trends and customer needs, conducting business case analysis and providing innovation suggestion to upper management. Additional control features are suggested and added to the innovation by upper layer management, to mitigate risks. The resulting innovation outcomes can be significantly different from the initial proposals, after multiple rounds of managerial review and functional modifications.

The innovation process at CCB is characterized by pro-government policies, centralized control and a top-down function-based governance structure. This innovation model enhances R&D efficiency, but also leads to increased diffusion costs, due to a lack of cross-division coordination. The layered innovation model is suitable for CCB: The innovation process is rational, well documented and collectively accounted for. Innovation at CCB shows a lifecycle model that prescribes a series of planned activities grouped into stages or phases. People at CCB proactively adapt to their environments and make use of rules to accomplish their goals. A responsible innovation approach (Muniesa and Lenglet, 2013) is suggested at CCB.

Based on the regulatory, normative and cognitive environments in China**, the internalized values (communist moral standard) and accountability (life-time accountability for financial crime) are two key drivers for responsible innovation in state-owned banks.** The government of financial innovation can be categorized into two major work streams, namely, top-down (policy governance) and bottom-up (self-governance). Tone at the top refers to the directives from the board of directors, company policies, supervisory requirements and regulatory framework adopted by the firm. The policy governance is often established, imposed and enforced by a higher authority. In contrast, self-governance allows the subordinate

businesses and operating units to specify, administer and enforce governance policies to manage and oversee the creation, development and commercialization of financial products and services. However, self-governance does not end at the bottom. In fact, the businesses and operating units are required to provide regular feedback and input to the top to introduce new ideas and amendments in the top governance framework, especially when the former is perceived flawed.

In this innovation model, the board of directors and NPC are the highest authority in the governance of innovation activities. Top-down policy governance is imposed from the Board and Committee to the Product and Innovation department in HQ, and cascading down to provincial, city and district branch levels. Policy will be expanded and localized when it moves from top to lower levels. At each level, the exercise of self-governance entails an open, collective and continuous commitment to being (a) ***adaptive*** – provide meaning, make sense and develop local operation guidelines to the principles cascaded from the top; develop products and services that meet the domestics market needs within the bounded innovation; (b) ***anticipatory*** – describe and analyze possible impacts from the innovation and governance model; develop local governance and risk management framework; (c) ***reflexive*** – reflect the underlying intents of the innovation; describe the stakeholders' values and how benefits might be distributed; (d) ***deliberative*** – engage with local users; extract user interface and experience feedback; collect feedback and identify potential areas of contestation; and (e) ***responsive*** – use the collected input from reflexive process to set the direction and influence the subsequent trajectory and pace of innovation through effective mechanism of upwards feed-forward governance. The entire innovation process is iterative, inclusive and open to adaptive learning, with dynamic capabilities, dual communication channels (vertical and horizontal) and a layered approach.

The author believes that inspiring bottom-up innovation is essential because more often than not, it is the people on the "front line" who identify the biggest opportunities for innovation. Top-down innovation, however, is equally important because it provides focus for innovation; it is obviously inefficient to have people focusing on developing innovations that are not on-strategy. **Strategy consistency, risk control, compliance with policies and procedures are dominant and embedded in the organizational culture of SOEs, like CCB.** In this context, it seems that a top-down innovation model is therefore suitable and adopted in CCB. To enable a top-down innovation model, it is important to develop an innovation strategy and a roadmap and communicate them to the broad organization. **To avoid biases and prejudices, a mechanism needs to be developed to facilitate environment scanning, customer-centric research, and ideation that will result in market-oriented innovation ideas.**

On a micro-level, CCB seems to have adopted a rational decision-making process. In this model, individuals are entitled to choose among all available alternatives that maximize net benefits over costs. Individuals in an organization are generally rational and "rational behaviour" typically means "sensible", "predictable" or "in a thoughtful, clear-headed manner". Individuals choose the best action according to their personal preferences and the constraints facing them. According to Becker (1976), the aggregate social behaviors are the sum of the behavior of individual actors, each of whom is making their individual decisions. Each individual has preferences, which are complete and transitive, among the available choice alternatives that allow them to state which option they prefer. In the case of CCB, new product ideas or requirements are collected from several sources, including front-liners, key customers and regulatory changes. All these innovation ideas/choices are weighted against development cost and future benefits by the central product development team, individually and then collectively. The recommended choices are then proposed to the NPD committee for endorsement at HQ level.

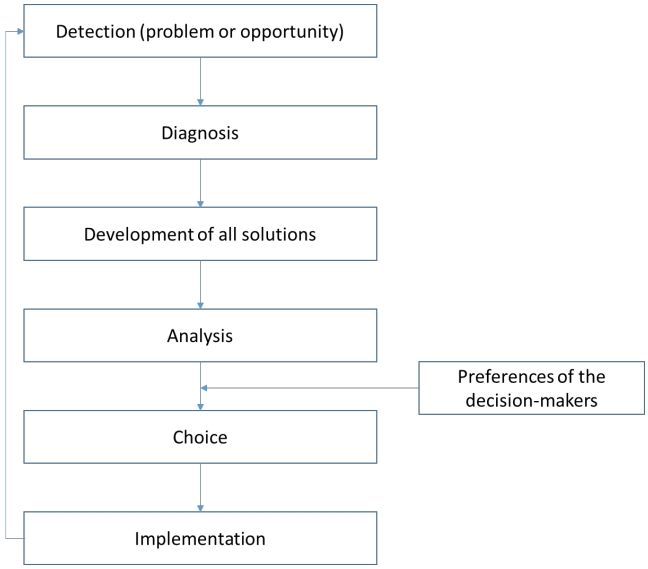

Figure 6-4: The "rational" innovation model (micro-level)

Source: Romelaer (2015)

According to Romelaer (2015), one key **advantage of this innovation model is "easy to adopt and manage" because it is logical, coherent and complete. The rational choice model gives a clear idea of what competencies the organization is lacking, namely, its constraints.**

Key requirements for this innovation model are: (1) The project manager or innovation department has to oversee all the innovation development steps to insure they fit together; and (2) The project team has to make sure that the firm has competencies for each of the steps. Some organizations may subcontract some of the key innovation process (after careful cost-benefit analysis), if subcontracting is not too difficult to handle. There is **a key issue with the rational model. Specifically, since it requires careful collection of complete cost-benefit analysis information, it becomes too time-consuming and costly to develop a complete set of all potential solutions for systematic and comprehensive evaluation.** In addition, the development of solutions may not well adapt to the organization, since individual preferences may not always align with organizational benefits/objectives. **One key limitation of the rational model is that it gives very little consideration to take excessive risks for any radical innovation activities.** Finally, **this kind of innovation model is suitable for organizations with the following characteristics: (1) bureaucratic and hierarchical organizations with formal procedures in decision-making process; (2) organizations with a closed innovation environment to select the most rational choices of innovation based on pre-defined criteria; and (3) organizations with an effective dialogue or communication mechanism with government agencies to optimize goal congruence and econometric alignment.**

The rational choice innovation model is suitable for CCB and aligns with its innovation strategy of being the "forefront of China's economic modernization and striving to be a world-class bank". **CCB's overall business strategy is policy-support and socially responsible.** Being one of the largest employers in the country, CCB assumes a social responsibility to ensure employment, financial and economic stability. It continues to expand financing in according to the "policy direction" and gradually develops its innovation capability in product and service development to meet the business requirements in the new landscape. As result, the business strategy and performance may not be fully "profit maximization oriented". In general, **organizational trajectory, bureaucracy, hierarchical and risk adverse culture are restricting CCB from excessive or radical innovation.** CCB adopts a **top-down, responsible and rational innovation model to "play safe" and installs "more control is better" and "me-too sign-off practices" for collective responsibilities in the innovation process.** Being a state-controlled bank, CCB is subject to the continued government influences over its strategic operations and senior management appointment. As a listed entity, it has financial responsibilities toward all its shareholders. CCB needs to balance these regulatory influences, agency issues and stakeholder responsibilities in its operation and innovation model.

Employment in SOE banks is considered safe and secured, and therefore no one would like to risk their career for risky innovation. **The rewarding and incentive system in SOE bank is "loyalty-based" and not pro-innovation. Therefore, a rational choice model is suitable for CCB as the innovation decision is rational, well-documented and collectively accounted for.**

This chapter has presented and analyzed the findings of CCB. It is argued that CCB pursues a "policy-supportive innovation strategy", which is supported by an innovation model of "layered and responsible" approach in general and "rational decision-making" in particular. The innovation process at **CCB is characterized by pro-government policy, centralized control, top-down vertical communication, conservatism, risk avoidance, social responsibility and rationality.** This model of innovation enhances innovation development efficiency, but it also leads to additional innovation diffusion costs due to the lack of involvement or buy-in from front-liners.

Chapter 7: Ping An Bank Case Study

Established in the 1990s, Ping An Bank ("Ping An") is China's first publicly listed national JSCB. Ping An Group is the first integrated financial services conglomerate in China with integrated and diversified operations in its **core insurance operations**, **securities brokerage**, **trust and investment**, **commercial banking**, **asset management** and **corporate pension business**. The Group was listed on Hong Kong and Shanghai Stock Exchanges in the 2000s. As one of the 12 JSCBs in China, Ping An Bank is a component of the FTSE China A50 Index, Hang Seng China 50 Index, and CSI 300 Index amongst others. Ping An is an **integrated financial conglomerate platform** and applies an operation philosophy of **"putting customers first**". Ping An is also known as an "innovator" in the Chinese financial service industry. After its merger with Shenzhen Development Bank (one of the largest commercial banks in Southern China) in 2012, Ping An continued to **"change, innovate and develop**" its banking business, promote strategic organizational transformation, and optimize an operation framework based on a business-unit system that drives financial service business developments on **"four wheels" (corporate banking, retail banking, interbank trading and investment banking).** Building the four characteristics of "**specialization, intensification, integrated finance and FinTech**", Ping An adopts a **"horizontal integration expansion strategy" and an "increased share of customer wallet"** to grow its financial service business, said an industry analyst from a professional accounting firm. Ping An invested more than RMB 50 billion in technology development. The Group gathered more than 23,000 R&D specialists and 500 big data experts and established six research institutes.

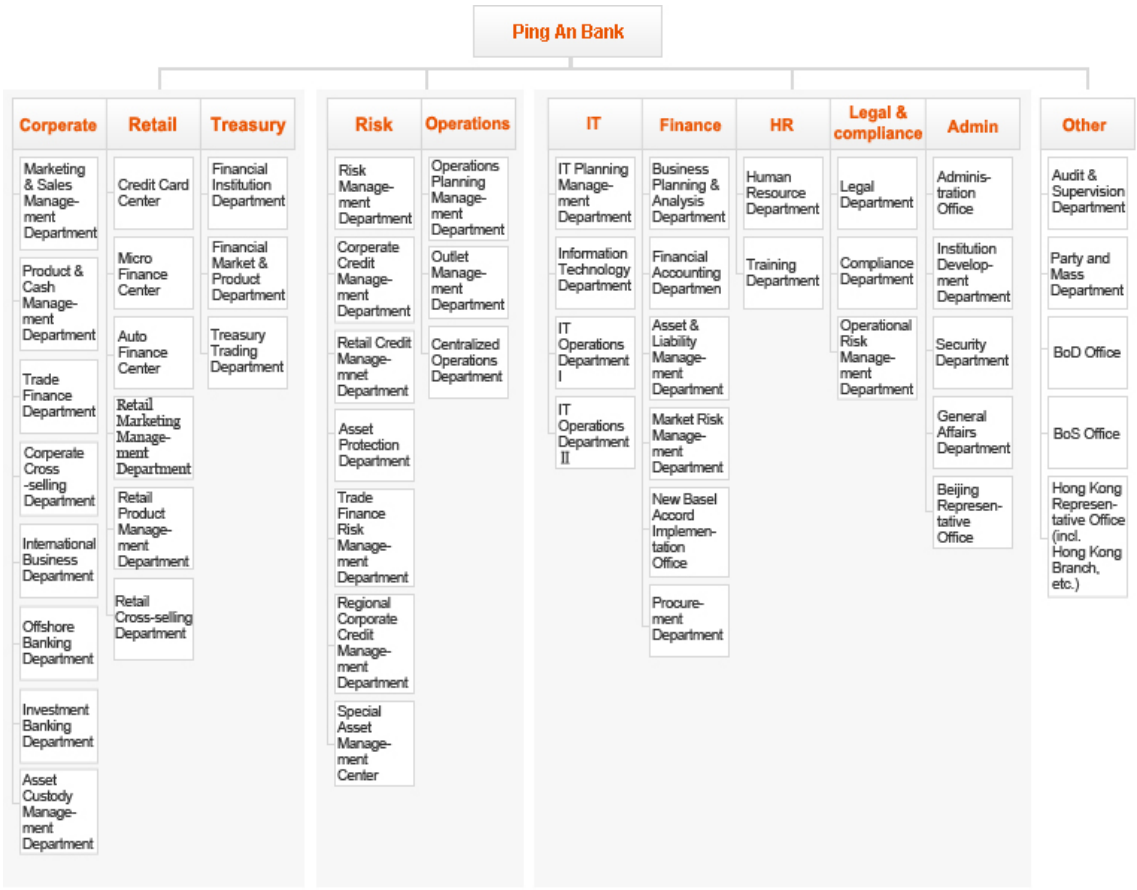

Figure 7-1: Ping An's organizational structure

Source: Ping An 2019 Annual Report

7.1 Business Environment

The first JSCB set up in China in 1987 was China Merchants Bank, which eventually grew to 12 in total as of December 2012. The 12 banks were established as commercial banks after China began its economic reform, and were subsequently transformed into JSCBs. In most cases, the original state entities that owned the banks remained a major stockholder after the conversion but were allowed to divest their shares after a mandatory holding period. For some banks, the state-owned entities chose to remain major shareholders (for example, CITIC Bank). For the majority of the JSCBs, a foreign entity purchased a significant holding of the outstanding shares, often after the bank received permission to list H shares on Hong Kong Stock Exchange (Martin, 2012). In 2019, JSCBs accounted for around 20% of the total banking assets in China.

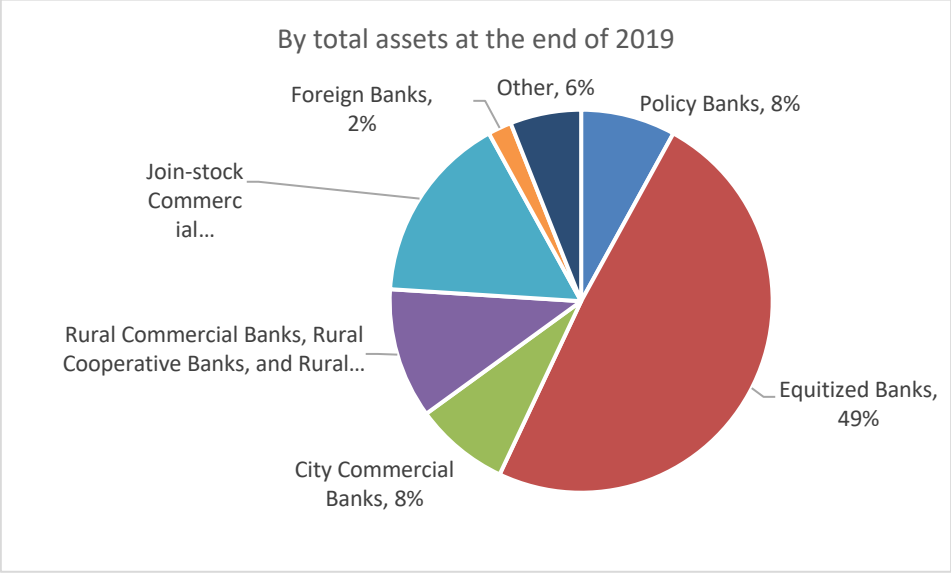

Figure 7-2: Market Share by Types of Banks in China (2019)

Source: Based on data in CBRC Annual report 2019

The senior management of the JSCBs are generally not shareholders. These senior officers of the private banks are appointed by the board of directors; and most of the senior officers are professional managers in the banking sector. From their management structures, stock ownership and balance sheets, it can be inferred that **China's JSCBs are largely operating on a commercial basis, but they may face pressure from two distinct quarters** to allocate loans and resources at variance with optimal business practices. First, the **continued presence of the local government or government-owned entities as major shareholders** – often with a voting member on the bank's board of directors – provides the local governments with direct and indirect means to influence the operation of the banks. Second, the banks may also be under the **pressure from private stockholders** who also have a voting member on the board – including their overseas investors – to provide preferential treatment to their companies, their families, and/or their friends (Martin, 2012).

PWC (2014) conducted a study on the performance of the Top 10 listed Chinese Banks in 2014. A total of 12 banks were analyzed, representing 73% of the total assets of China's commercial banks. Ping An was one of the sample commercial banks selected in that study. The Top 3 intermediary businesses for LCBs, mostly (state-owned) were bank cards (25%), settlement & clearing (19%), and consulting & advisory (16%). While the top 3 intermediary businesses for JSCBs were bank cards (29%), wealth management, private bank and custodian (23%), and agency (14%). **JSCBs were more diversified in their revenue and operation**

models, and had advanced their private banking business by leveraging on the "know-how" transferred from strategic investors.

The growth for LCBs was largely contributed by net interest income as a result of expansion in interest-earning assets. Meanwhile, JSCBs recorded strong growth in both net interest income and fee and commission income. **JSCBs' continued growth in fee and commission income was due to higher growth in bank card, agency, wealth products, private banking and custodian, and e-banking business (such as payment and clearance income from mobile banking).**

While the yields on interest-earning assets of JSCBs were higher than those of LCBs, their costs on interest-bearing liabilities were higher too. The borrowers from LCB loan portfolios were mainly SOEs and large corporations and such loans had relatively lower yields given the low default risk. **LCBs' deposit base was broad, with an extensive network of retail customers which enabled them to lower the funding costs. The average payroll cost per headcount of Chinese LCBs was lower than that of JSCBs.**

The interest income from investments was the highest growth segment for JSCBs due to the income from trust beneficiaries' rights and asset management schemes. Conversely, an analysis of the interest expense in **JSCBs suggested that they have been increasingly reliant on inter-bank borrowings to make up for the weak growth in deposits.** At the same time, **LCBs had a higher proportion of corporate loans, while JSCBs had higher personal loans. A further analysis of the structure of JSCBs' personal loans indicated that the largest segment was personal business loan, followed by personal housing loans and credit cards.** LCB's personal loan portfolio had the largest proportion in personal housing loans followed by credit cards.

The top five corporate loan portfolios were: (1) manufacturing; (2) wholesale and retail; (3) real estate; (4) leasing and business services; and (5) transportation, storage and postal services. These accounted for 71.70% of JSCBs' corporate loan portfolio. The Top three industries for JSCBs were also those experiencing the most significant slowdown in economic growth. The study found that **both LCBs and JSCBs were experiencing increase in NPL balances and ratio, a clear sign of further exposure to credit risk. Banks were increasing their provisions in loan loss reserves.**

Finally, deposit growth has slowed down for both LCBs and JSCBs. The liability structure showed that **deposit proportion of total liability was 80% for LCBs and 70% for JSCBs respectively. The slowdown of deposit growth was caused by the increase in WMPs and**

Internet-based financial products and services popularity. With slower deposit growth, balances of inter-bank liabilities and borrowings from central banks were increased.

There are three types of "private" commercial banks in China: (a) foreign-owned commercial banks (such as HSBC), (b) JSCBs (such as Ping An) and (c) local-owned private commercial banks (such as MYbank, owned by Ant Financial, an affiliate of Alibaba Group). A joint stock commercial bank, by definition, is owned by several large investors. These investors can be local private companies, foreign banks or companies, local governments (or their agencies) or individual investors. When several key investors control a significant equity ownership of a financial institution, the financial institution is considered a joint stock commercial bank. In general, joint stock commercial banks (JSCBs) are found more efficient and profitable than SOCBs. For example, Fu and Heffernan (2005) assessed the impact of different ownership types and bank performance on X-efficiency of 14 key banks (1985-2002). They found that on **average JSCBs are more X-efficient (ability of a firm to get maximum output from its inputs) than SOCBs**. Similarly, Yao *et al.* (2007) used a panel data of 22 state-owned and non-state banks in China from 1995 to 2001. They found that two factors had significant impacts on the level of efficiency, respectively ownership characteristics and equity/asset ratio. On average, **non-state banks outperformed state banks by 8-18% in terms of profitability.**

Shiha *et al.* (2007) compared bank performance along four dimensions using Principal Component Analysis (PCA). The four dimensions included liquidity risk, credit risk, capital risk, and profitability. PCA was conducted using key indicators reported in the 2002 PBOC Banking Survey. They found that in terms of overall performance and credit risk management, JSCBs performed significantly better than both the state banks and CCBs. In China, unlike in other developing countries, the size of a bank was not correlated with its performance. **Mid-size national JSCBs performed considerably better than the Big Four banks and smaller CCBs in terms of revenue diversification, efficiency and profit ratios.**

Theoretically**, the joint stock model means that several key investors must collaborate to formulate the bank's market strategy, development plan, product profile, customer policies and innovation roadmap.** It is similar to the idea of a joint venture, where two or more key strategic partners jointly create a new company, product, or service, or enter a new market. By opening up ownership and control to external strategic investors, a commercial bank can develop new market strengths and innovation capability. **JSCBs are considered more open and innovative than state-owned or foreign banks. This is because of their flat organizational structure and lean operation model that encourage innovation and profit**

optimization. Do all these general beliefs apply to Chinese JSCBs? Although a few quantitative studies were conducted on the performance and efficiency of Chinese JSCBs, qualitative analysis of the inner innovation process and their attitude towards risk and regulation are generally lacking.

The above analysis **shows that the Chinese banks' (both LCBs and JSCBs) net profit slowed to single-digit growth, with profitability indicators (ROA & ROE) falling. In response to these challenges, how did Ping An adjust its business strategies to improve its core competency and competitiveness?** These questions are addressed in the next section of this chapter.

7.2 Business Strategy

Ping An's vision is to become the world's leading provider of integrated finance or conglomerate financial services. Based on the published materials from its official website, Ping An has evolved from an insurance company into a "technology-driven" integrated financial service group.

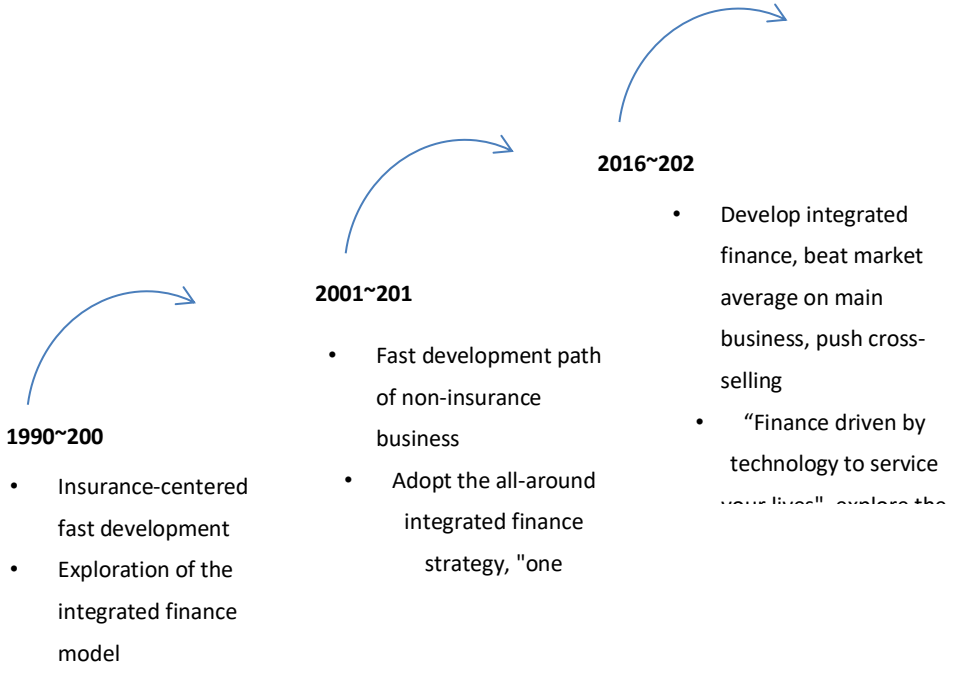

Figure 7-3: Ping An's development strategy

Source: adopted from published materials from Ping An's official website

Based on Ping An's development strategy published on its website, Ping An believes that the Internet will impose significant impacts on the financial industry in the future. According

to Ping An's research, (1) within the next three years, more than 60% of cash and credit cards will disappear; (2) within the next five years, the front-office work of most small- and medium-sized financial institutions will be done by the Internet enterprises; and (3) front-office work of financial institutions will move towards "small size, community base, intelligentization, and diversification" kinds of operation model. According to Ping An, traditional banking can be characterized as a single channel and transactional-based operation model. Internet banking has the features of multiple integrated channels, being driven by innovative products and access to banking services anywhere anytime. With the application of FinTech (financial services provided through FinTech), Internet banking will be a traffic-based, life-related ecosystem and user-driven financial innovation model.

Based on the Company's website, Ping An strives to become a world-leading provider of personal financial services by following the concept of **"Driven by Technology, Finance can Serve Life Better"** to concurrently develop its core finance business and FinTech business. For the core financial businesses, Ping An focuses on building up the **financial supermarket** and promoting customer migration. As to the FinTech business, Ping An follows the concept of **"internet traffic as the key; incorporate services into everyday life; value-driven"** to weave financial services into the very fabric of everyday life, spanning areas such as health, food, housing, transportation and entertainment. It also established the **integrated financial services platform of "One Customer, One Account, Multiple Products, and One-Stop Services".** The Bank aims to offer customers a broad experience of **"Expertise makes life easier"**, achieving sustainable growth in profits, while providing long-term and stable returns to shareholders.

Ping An is a personal FSG in China with a comprehensive range of financial service licenses, a wide range of business offerings and close ties with its controlling shareholders. Ping An is one of the few financial groups providing customers with a full range of financial products and services including insurance, banking and investment. In addition, for the FinTech business, **Ping An has developed new businesses including Lufax, Wanlitong Loyalty Points Program, auto market, housing market, e-Payment and mobile social finance portals. In 2018, Ping An achieved rapid growth in the FinTech business, with the total number of users reaching approximately 250 million and a preliminary internet financial strategic system of "One Gate, Two Focuses, Four Markets".** While it has achieved significant growth in its FinTech business, Ping An believes in further growth opportunities for its core financial businesses.

Ping An's financial innovation strategy is "**Everything needs to be free to attract users first. Then you start to monetize the offerings by cross-selling and up-selling**." The Deputy CEO said, "*In the last two years, about 35% to 40% of our new financial-services customers—people who open a bank account or buy an insurance product—have been users on our platform who were new to Ping An and had not previously purchased any products. We currently have around 486 million online users that we reach in our ecosystem. So, we have created this virtual cycle, whereby our customers have developed some affinity with us, and naturally buy from us. We think this ecosystem model is much better than the more traditional one where a customer has to buy a product first and then you provide services based on their needs*."

Ping An has developed a lot of home-grown technologies, including facial recognition, artificial intelligence (AI], and blockchain. Why did Ping An (as opposed to banks in general) **prefer to build technology in-house** rather than licensing it from others? The Deputy CEO said, "*In the beginning, some were out of necessity. For example, when we were looking at facial recognition five years ago, the options out there did not accurately register Asian faces. The same was true with voice recognition. We wanted to use it in our call center to recognize customers' voices, but the options available to us were not very good at recognizing Chinese dialects. The other reason was that, particularly with AI, our needs were very specific to the scenarios we were solving. Unfortunately, many technology companies might offer machine-learning techniques, but they do not really understand our business, and it takes a while to build that understanding*."

Internet payment and settlement was an effective way for the Bank to increase the number of basic corporate customers, obtain low-cost liabilities, increase the income from non-interest intermediate businesses and reflect the strength of comprehensive financial services. Through diversified payment instruments and settlement methods such as electronic accounts, code-scanning payment, and non-perceptible payment, the Bank improved transaction efficiency and reduced transaction costs.

In the process of promoting the "**payment + accounts + scenario" strategy**, the first matter of the Bank was to **carefully select industry**. The Bank focused on strategic industries and Internet emerging industries related to national economy and people's well-being; Meanwhile, with the advantage of the Group, it **integrated into the Group's ecological cycle including automotive, housing, health care and smart city, to provide one-stop and closed-loop financial services with a more comprehensive coverage of customer life scenarios through the "finance + ecology".** The second was to **carefully cultivate the customer base**. The Bank combines segmented scenarios with industry needs and provides customized

financial services such as payment settlement, identity authentication and transaction witness for leading Internet customers. The third was to **carefully tailor product offerings**. With the account system and capital management capabilities as the core, the Bank integrated front-end collection and back-end payment and superimposed diversified products and services such as capital appreciation, data financing, integrated finance and enterprise services to form an **integrated transaction banking service capability**. At the end of the reporting period, **the Bank launched 300 new Internet payment settlement platforms in 2018, a year-on-year increase of 70%.**

Innovation is in the DNA of Ping An, which believes that one must change to live and innovate to live better. Leading integrated finance with modern technologies is one of the two strategies of Ping An for the coming decade. As a result, the Group has set up a one billion VC fund, which is dedicated to venture investment in new ideas and start-ups out there, including but not limited to areas of finance, consumption, healthcare, automobile, social network and AI. This VC is like the technology radar of Ping An.

7.3 Business and Innovation Performance

The analysis of Ping An's performance is divided into two parts, namely, business performance and innovation performance. The first part of performance analysis s focuses on the financial and operational performance of Ping An in China specifically, whereas the second part of performance analysis focuses on the product, process and business model innovation of Ping An in China. The analysis timeframe is from 2018 to 2019, generally based on information extracted from annual reports, corporate announcements on its website, internal documents, management reports, announcements, policies and interviews with Ping An's employees, industry practitioners and analysts.

According to Ping An's annual report, at the end of December 2018, Ping An's total assets amounted to more than USD 500 billion (5% annual growth rate) and operating income exceeded USD 17 billion (10% annual growth rate). Net non-interest income (50% annual growth rate) represented 40% of operating income. According to the calculation criteria in the "Measures for the Management of Capital of Commercial Banks (Trial)" of CBRC, Ping An recorded a Tier One capital adequacy ratio of 9.39%. In short, Ping An is a fast growing and healthy financial institution.

Ping An kept seeking two-way breakthroughs in products and channels. On the one hand,

it strengthened its banking channels, used the Group'' various products to increase customer stickiness and contribute value, and achieved scale-based revenue breakthroughs in the way of **"product portfolio + scene integration".** On the other hand, it leveraged the advantages of the Group to **build a banking business portal in the "finance + technology" scenario, closely following the "finance+ ecology" strategy** in innovating the cooperation model of comprehensive finance, and fully mobilized the sales force of the Group's comprehensive financial channels to effectively enhance the main businesses of the Bank. At the end of 2018, the number of comprehensive finance customers reached 34,200, up by 17.1% over the end of the previous year. The volume of new bank-investment bank cooperation projects reached RMB 234,730 million, up by 125.9% over the end of the previous year.

Ping An also strived to attract science and technology talents, including recruiting many **compound high-end technology talents from the Silicon Valley** as well as overseas and domestic leading Internet enterprises to continuously optimize and improve science and technology talent teams and advocate the leading ability in science innovation. **At the end of 2018, the number of engineers of the Bank reached 6,000 (including outsourced talents),** a year-on-year increase of over 44%.

In order to implement the Bank's strategy of "**being technology-driven, pursuing breakthroughs in retail banking, and reinventing its corporate banking**" and support an agile transformation in the Technology, the Bank completed a Three-Year (2019-2021) IT Development Plan in September 2018. After analyzing the status quo and future development requirements, and comprehensively considering the best practices of the industry and characteristics of the Bank, the Bank determined the overall goal of "**the overall technological capabilities of the Bank being among the first echelon of the joint-stock banks and some capabilities being on top in the next three years**", and clarified the specific action plans, work focuses and corresponding implementing strategies for the next three years. The plan serves as the overall guidance for all the information and technology work in the next three years.

The Bank regards "**being technology-driven" as its primary development strategy**. Its investment in technology experienced a significant increase in 2018. **IT capital expenditure amounted to RMB 2,575 million, up by 82% year on year. At the end of 2018, the number of engineers increased by more than 44% over the end of the previous year**. Additionally, the Bank took the initiative **to implement agile transformation and changed the role of information technology from traditional support to business development drive.** With respect to technological innovation, the Bank relied on the **core technologies and resources of Ping An Group in such fields as AI, blockchain and cloud computing**, and applied new

technologies to its business, so as to **continuously improve customer experience, enrich financial products, innovate business models, improve risk control system, optimize operational efficiency and promote intelligent management.** The Bank's "being technology-driven" strategic transformation has shown preliminary results.

To rapidly respond to business needs and strategically shift the information technology from its traditional role of supporter and guarantee to its new role of business driver, the Bank established **a lean and agile dual-mode R&D system to promote agile transformation, strengthen the deep integration of technology and business, and develop and improve dual-mode R&D management methods, lean R&D implementation rules, and agile R&D implementation rules**. In 2018, the technical staff dispatch model was implemented in the corporate business line after its implementation in the retail line. **The agile development model was piloted in projects such as Pocket Finance APP, "FB Remote Counter" and "Smart Management"** to greatly hasten product iteration, improve delivery quality and enhance customer experience. In 2018, the deliveries associated with business need development of the Bank increased by 100% on a year-on-year basis.

To further improve refined management over science and technology, in 2018, **the Bank established the PMO system for IT line, followed up all the key projects and work matters**, proactively identified problems and assisted in management duties, enhanced collaboration and information sharing among IT teams, and improved organization and execution abilities. It also introduced the **function point evaluation method to perfect the development measurement mechanisms, promoted the use of various automated tools to enhance automation in the development process, and further improved development management**.

The Bank was also committed to creating a flexible, secure and open technology system to support the rapid business growth, Internet transformation as well as product and service innovation. At the end of the reporting period, the Bank established a complete science and technology disaster recovery system and big data platform technology system, accomplished the cloud deployment of the whole development and test environment and part of the production environment (IaaS), **started the establishment of basic PaaS (Platform as a Service) platform featuring open platform technology, billion-byte processing ability, comprehensive support for agile development, flexible expansion, secure operation and maintenance, better support for business continuity, and technical automation and controllability.** By the time of the interview, the planning and model selection related to the distributed PaaS platform had been completed and were ready for pilot projects. **Tenglong core system won the "2018 IDC Asia-Pacific Core Innovation Leader Prize",** making the Bank

the only core system winner of this prize in the Asia-Pacific region. The "Pocket Bank Security Project" won the 2018 Asian Bankers' "**Best Mobile Phone Security Project**", and the "Indexing Assessment System of Data Centre Based on Big Data and Best Practice" won the 2017 **Financial Science and Technology Outstanding Contribution Award of the Financial Computerization Magazine**.

Pocket Finance APP is an integrated one-stop mobile financial service platform launched by Ping An Bank for **B-end customers in 2018**. It adopts "**platform + product + service**" as its core business model, provides enterprises with more efficient and secure corporate financial services at lower cost through unified portal, brand, platform, interface and underlying support, and connects to a wide range of heavyweight scenario partners on business management. **Corporate customers** can enjoy basic financial services such as payment settlement, payroll and account management, as well as comprehensive financial services such as financing, wealth management, insurance, mobile office and financial management. The Bank had provided customers with **mobile-based enterprise lifetime integrated services**.

As one of the benchmark products in the Bank's practice of **finance + technology** in corporate banking, Pocket Finance employs a wide range of mature technology innovation applications to embed latest financial technology achievements in FinTech applications, such as **biometrics, OCR (image recognition capabilities), cloud signing and big data in customers' high-frequency business scenarios, to create ultimate user experience for corporate customers and improve business processing efficiency.** For example, by introducing a number of patent technologies in biometrics from Ping An Technology, Pocket Finance APP can be instantly logged in without inputting complex user names and passwords; with mobile phone certificate technology, corporate customers can enjoy ultimate non-perceptible payment like individual customers on the APP, which allows finance staff and managers of enterprises to easily complete large amount transfers without compromising security. The biggest beneficiaries of these services were private enterprises and SMEs that crave for professional treasury services but were unable to afford expensive administrative costs. According to statistics, at the end of 2018, **the number of registered customers of Pocket Finance reached 280,000, the cumulative number of transactions reached 1.5 million, and the transaction amount exceeded RMB 830 billion.**

The Bank set up **an innovation garage, established an innovation committee, promoted professional technology sequence to stimulate science and technology innovation by means of a good mechanism, and fully facilitated the application of cutting-edge science and technology** in its operation and management. It rapidly pushed forward the combination

of cutting-edge technologies and financial application scenarios based on the core technology and resources of Ping An Group in sectors such as AI, blockchain, cloud computing, big data and information security.

Under the help of mobile internet, biometric identification, big data, cloud computing and AI, the Bank created brand-new business processes and risk control models in three dimensions: First, **the Bank performed remote identification by checking customers' identities online through face recognition, voiceprint recognition, public security network verification, UnionPay authentication and other means**; second, based on the credit data from PBOC, the bank cooperated with UnionPay, provident fund centers, industrial and commercial bureaus, tax bureaus, mobile operators and third-party platforms, **used AI to comprehensively analyze the data and portray customer images in 360 degrees, and cultivated credit evaluation ability, anti-fraud ability and risk warning ability based on multi-dimensional real-time data**; third, the Bank combined mobile applications with centralized remote operations to greatly improve business operation efficiency and effectively control risks. For example, **the SME data loan platform KYB (Know Your Business) was developed by the Bank using this innovative technology in the context of responding to China's call of "supporting inclusive finance, removing financing barriers and lowering financing costs for SMEs". At the end of 2018, KYB issued by the Bank amounted to over RMB 10 billion. A single loan was approved within 60 seconds and granted within 10 seconds.** This product won the "2018 China Financial Technology Innovation List - Excellent Case Award for Banking Science and Technology Innovation". In terms of blockchain, the Bank kept exploring in-depth application and innovation in supply chain finance and other areas. For example, the **application of blockchain technology in the Supply Chain Accounts Receivable Service platform (SAS platform) made the assets traceable and unable to be tampered with.** Meanwhile, the use of **robotic process automation (RPA) technology helped to achieve business automation processing, greatly improving the efficiency and quality of the traditional manual operation process of the Bank**. This technology, applied to multiple business scenarios such as open account verification and open account PBOC data entry, increased the business efficiency by over 60% compared to that of manual processing.

In 2011, Ping An **set up a digital-based financial asset exchange company named Lufax**. Lufax was incorporated to provide financial products/services innovation, new technology applications/platforms, financial data analytics and market research to investors and member firms of Ping An Group. Lufax had a P2P online financing platform, but planned to exit the P2P lending due to the tightened regulation. The investor can select other types of "state policy-

supported" investment such as green, new energy and 5G on the platform. CGI provides principal and interest guarantee based on different product structures. Lufax is both the designer and consumer of CGI products. **The Chinese market is changing fast. Ping An has been actively acquiring new companies, such as Lufax, to enrich its financial service provision overall capabilities.**

7.4 Ping An: Aspects Related to Research Questions

Data in this section were primarily based on interviews with officers from Ping An. To make the interview discussions more specific and concrete, the interviewees were asked to share specific examples from their business functions. Therefore, materials presented in this section refer to innovations in Credit Guarantee Insurance (CGI) Solution. The interviewees were **Deputy CEO (Executive), Division Manager (Manager), Product Development (Product) personnel, Sales and Marketing (Sales) representatives, Innovation Management (Innovation) personnel and members of the Risk Management (Risk) Department.** In addition, written materials (where applicable) and observations were used as supplements.

What is Credit Guarantee Insurance (CGI) in Ping An? CGI is a new product division within the insurance arm of Ping An. The CGI division makes use of the vast amounts of credit information (Big Data) from its network of property and casualty insurance brokers and agents, interprets and utilizes this data to determine and establish a credit rating system for its insurance customer to provide unsecured financing. CGI was established to fulfill the "gap" in micro-financing (lending to SMEs) which many large banks were not prepared to venture into. Unlike the US, China lacks a credit rating system.

Why is GCI innovation important to Ping An? Besides the PBOC's financial consumer credit records, China lacks a formal and widely-accepted credit system. This led to the increase in transaction costs, SMEs financing difficulties and surge in shadow banking. Many E-commerce firms established tailored credit system for their vendors and buyers based on transaction records analytics. Likewise, Ping An also tried to establish a credit rating system for its insurance customers to sell integrated financial products.

What is Ping An's plan on GCI and how is it integrated into Ping An's overall business portfolio? According to the Division Manager, Ping An acquired a guarantee company. CGI will develop some secured micro-financing. Also, CGI may work with P2P internet banking and E-commerce operators on credit data exchanges (with owner permission). CGI is a new

financing product to fill the micro-financing gaps. It is a high-risk and high-return business. Regulation in this area can be further established to protect financiers' interest.

7.4.1 Financial Innovation Process

At Ping An, the product/service innovation is divided into two major types, namely, top-down innovation and bottom-up innovation. **For top-down innovation, the innovation process is driven by the strategy planning department. These innovations generally feature large investment, major impacts and cross-platform products/service innovations**. The strategy planning department will perform market research, regulatory changes review and consolidate ideas from different service lines to develop an annual new product and management innovation plan. The innovation plan will be submitted to the innovation committee for review and approval. Once approved, the plan will be distributed to respective service lines for deployment and KPI tracking. The department is also responsible for driving and monitoring the implementation of major/key innovations, including identifying the responsible service lines/departments; reviewing, approving and managing the innovation project request process and implementation plan; driving new technology/business model feasibility study research; coordinating project resources & technology needs matching; organizing acceptance review of the innovation output and success; and tracking the lifetime value contribution of the new innovation. The importance of the strategy planning department lies in consolidating and coordinating the innovation needs of multiple service lines to avoid reinvention of wheel and waste/poor utilization of resources. To promote innovation diffusion, the strategy planning department organizes annual innovation competition to select and display top innovations for further roll-out within the Group.

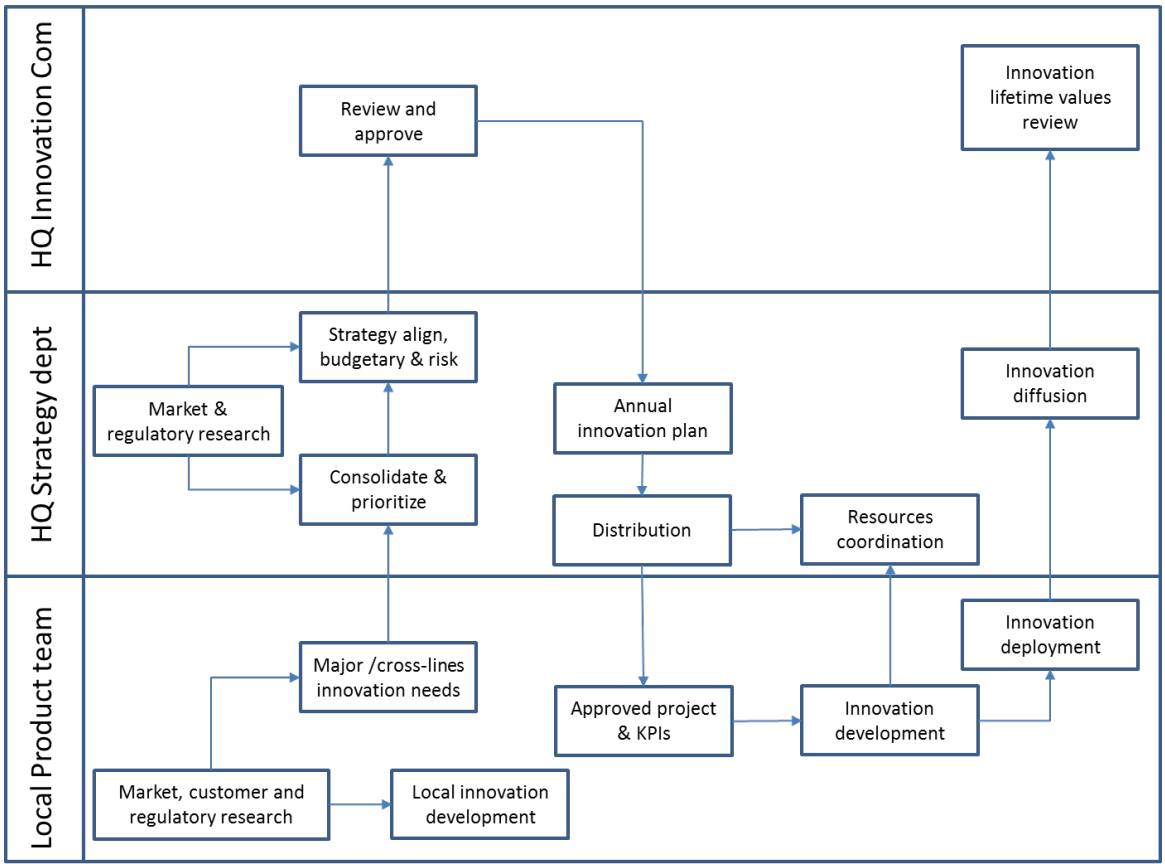

Figure 7-4: Ping An's top-down innovation process

Source: Author's analysis

For bottom-up innovation, the innovation process is driven by the local product development team. These innovations generally feature small investments, minor impacts and intra-platform service line products/service innovations. The product department first performs market research to identity new product requirements, opportunities or ideas. The source of innovation ideas can be internal and external. The internal source is generally from the customer service/relationship manager for consolidated common customer requests. The external source includes new technologies, new business models, new regulation opportunities and new products/services offering the product development team market observations.

Once the product team generates an idea, the team will first informally perform a preliminary check with respective departments for feasibility and adjustment feedback. When the NPD case is justified, the product team will first review the product, credit and operation risks with Risk department. Risk department will provide feedback on the risk scoring, the risk control policy and some specific risk management procedures. Concurrently, the product team will work with the marketing team for product packaging and promotion, with the training department to develop the new product training manual, with the operation department to

establish operation protocols for the new product, and with the sales department to determine the broker/agent commission & e-platform rebate.

Once the product concept is finalized and ready for IT deployment, the product team will work with IT to develop the new product parameters in the system. The IT development is a recursive process involving communication, revision, testing and confirmation. When the product development cycle is complete, the product department will raise "new product launching" approval to seek approval from the NPD committee. A typical NPD cycle takes on an average of three months to complete. The product department will provide training to sales through Video Conference, hotline support and marketing materials. After deployment, the product team will monitor the performance of the new product and continue to upgrade the product design and IT system if any deviation is found.

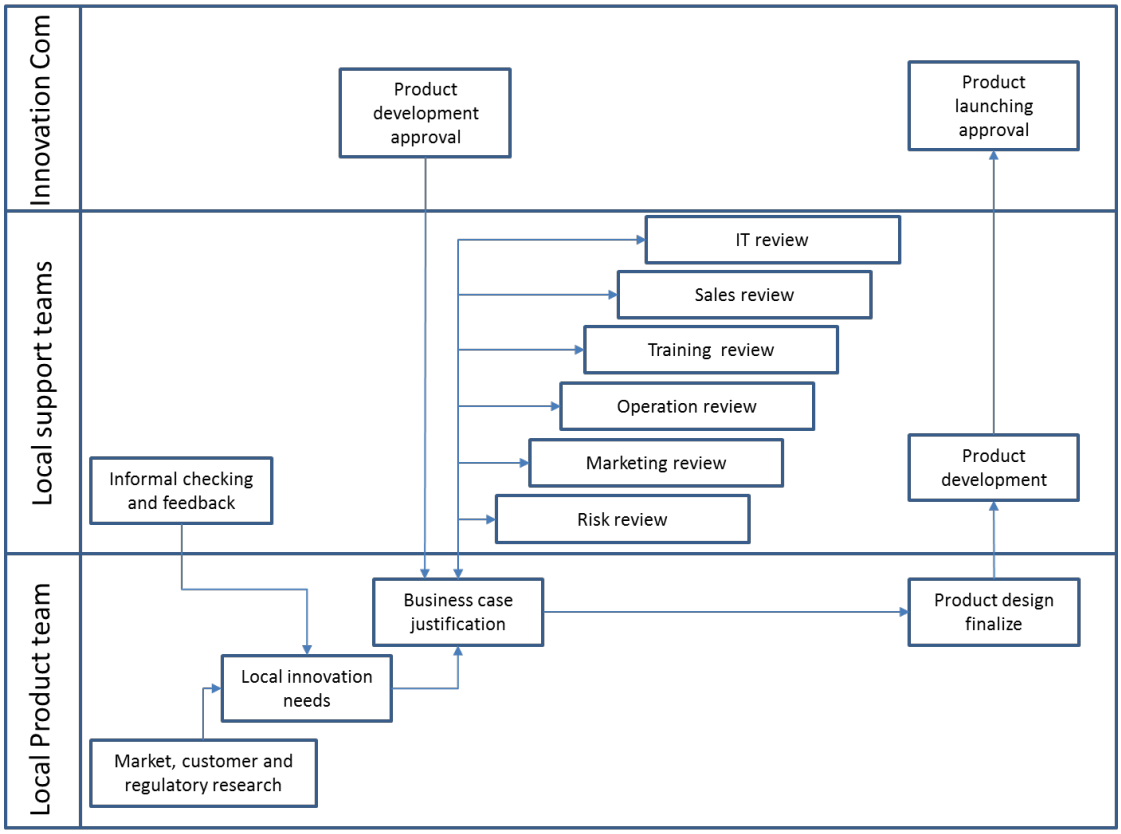

Figure 7-5: Ping An's bottom-up innovation process

Source: Author's analysis

Further analysis

The financial innovation process at Ping An shows a few interesting features. **At the group**

level, all major & cross-service lines innovations are centrally managed and coordinated. A centralized gate-check innovation process allows resources and technologies to be put together to optimize strategic outcomes and reduce duplication waste. The successful innovation outcomes are diffused to service lines for adoption.

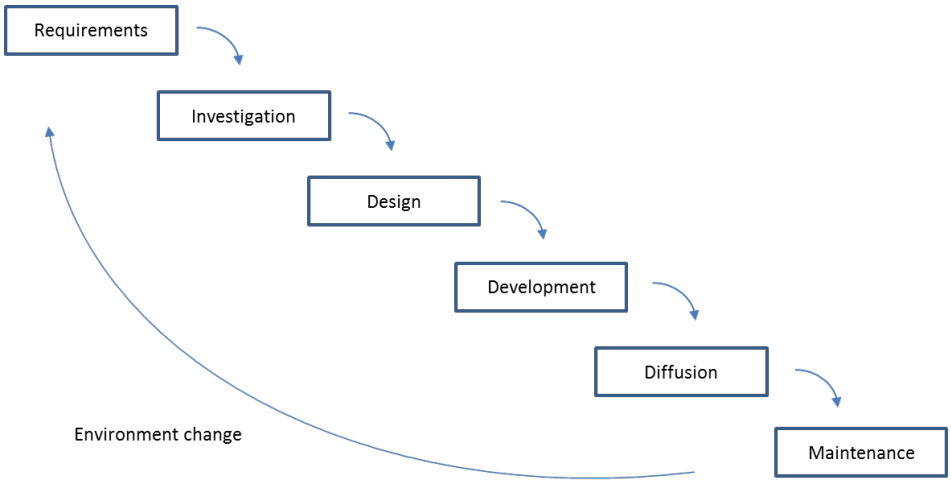

Figure 7-6 Ping An's traditional waterfall or sequential innovation process

Source: The author's analysis

At the operational level, the product team adopted a concurrent engineering approach to the product/service innovation. The product team consists of representatives/expertise from different skill lines. The team pursues a product development process by combining and diffusing technologies, knowledge, and experience cultivated on the product concept, development process and the front-line of product application. **This model is evidenced by fast speed-to-market and high product integration/adoption capability**. However, efforts are required to reduce loss (costs) in the communication process.

When asked about the **issues in the current innovation process**, the Innovation Manager said, "**There are too many parties involved in the new innovation product review and approval process**. Each review takes time and "**adds on" additional requirements that may make the product less and less user-friendl**y. We have a lot of paperwork to complete and many approval signatures to obtain. From another perspective, we are **short of talented people**. We need good and innovative people to understand the market expectations and develop good products that meet users' needs. We are continuously recruiting good people who are head hunted by financial institutions and Internet firms. We must pay good price to find good people. Therefore, leadership support is critical at Ping An for cross-departmental and cross-organizational coordination to eliminate inter-departmental obstacles and effectively leverage

talents" In short, **the lengthy approval process and shortage of talents are constraints to innovation.**

The Deputy CEO also concerned about the lengthy review and approval process at Ping An and said, "*We are not being fast enough. There are just so many things to do, and speed is of the essence. And what is especially exciting about China is that you may be the best now, but* ***if you are not fast enough, a 70% solution can beat you****. The market is too big and too competitive. There is a hunger that you can see in the market. You must have good people who are motivated, driven, who want to go out and make things happen. We have been successful, but we cannot slow down*."

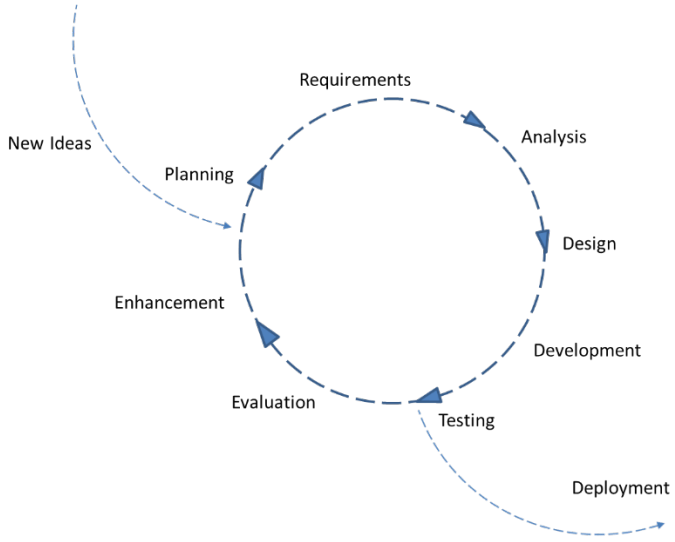

Figure 7-7: Ping An's interactive concurrent innovation process

Source: The author's analysis

The Bank's strategy is "technology-driven, speed-to-market and scenario-based" in new service and product innovation. The Chinese market is changing fast, and one needs to penetrate into the market before competitors enter. In this context, the innovation strategy is not to "develop a perfect product" but to quickly launch a product and continue improving it by leveraging on a common platform of customers, operation protocols, technology and product interoperability. The focus is on integrated processes and products to develop "total concept". Typical of this fourth generation is the "parallel and integrated nature" of the development processes. Externally, strong supplier/partnership/alliance linkages are established as well as close coupling with leading customers. The overall objective is to build an "integrated finance business ecosystems" by leveraging on Ping An's large customer base in Insurance and Banking businesses.

Based on the integrated business processes model, the focus of Ping An's innovation was shifted from developing products to putting the products in a total business concept, including such elements as customers, services, distributions, and multi-product platforms integration. Said the Product Manager, "*Ping An is continuously learning from and with customers, moving away from the product focus to the total concept focus - One Customer, One Account, Multiple Products, and One-Stop Services, where activities are conducted in parallel by cross-functional teams.*" The integration and parallelization of development activities were brought forward as success factors when striving for speed.

7.4.2 Regulatory Dialectics Reconciliation

Financial innovation and regulatory compliance are not always aligned in peace. In some cases, aggressive innovation might invade the interests of financial consumers and cause damages or instability to the society. Regulations are developed and imposed on financial institutions to curb irresponsible innovation and act as a check-and-balance mechanism. When there was a dilemma, how did Ping An reconcile the dialectics between innovation and regulation? Whenever a conflict between compliance and innovation arises, compliance always prevails. The risk department is normally informed of the regulatory changes. Financial service is about risk management. Regulatory changes put higher requirements on the bank's compliance capability and robustness of risk management framework.

To maintain a balance between business growth and effective policy/market risks management, Ping An implemented five strategies. The Bank Manager said, "*First, we leverage on product and platform innovations to sustain high business growth. On a customer centric model, we achieve win-win with growth in both our business and customer net wealth. Second, we adopt to the changes in the regulatory environment and further adjust our asset structure to meet the regulatory requirements. Based on the loan ratio policy changes, we improve and quickly adjust the bank's proportion of loan assets. Third, we closely monitor the business environment changes as influenced by FinTech development. We accelerate the product and business model innovations and continue to strengthen our operation model of new products and innovative monetary funds. Fourth, we deepen internal resolution to enhance business efficiency, performance and quality. We have developed many management and operational tools to improve customer satisfaction. For example, we have reduced the cycle time to open new accounts by more than half through elimination of papers/forms and simplified procedures.*

Finally, we developed a total risk management framework and control to monitor the market, operation, credit and liquidity risks of our new product innovation and business inventions in a real-time manner. This is critical as the government continues to liberalize interest rates and internationalize Renminbi in the Global market. In short, we are moving from a semi-closed to a fully open financial system soon. Therefore, we need to construct a mature system/mechanism to manage interest risks and grab opportunities in the global market"

The Risk Manager said, "*Since 2014, Ping An has set up product risk management functions at HQ and branch levels. These functions are reported directly to the Risk Management Committee (RMC) at the Group level. It is responsible for developing product risk management procedures, reviewing the new product risks before deployment, monitoring the product risks performance in operation, and performing product risk and control audits. We are developing a one-stop and lifecycle risk management over new products and new business inventions. We support innovation within the boundary of regulatory compliance and risk management.*"

Ping An implements regulatory compliance and risk control over its integrated finance businesses from three key aspects, namely, management system, performance KPIs and operational tools. The Innovation Manager added, *"First, we have developed a new product risk management system, which includes setting up a special taskforce to study and design risk management framework over integrated finance product innovation, providing guidelines for NPD and deployment, developing policy, procedure and process for new product innovation, and providing training to business on regulatory compliance and risk control requirements over financial innovation. Second, we have implemented comprehensive KPIs to govern new product performance and risk over the entire lifecycle, which includes risk quantifications and pricing, economic capital allocation and utilization, intermediate income requirements, capital returns and other quantitative and qualitative regulatory KPIs. Third, we have developed many operational tools to assist us in new product risk management. These tools include new product risk modeling, risk data mart, risk management dashboard, risk and compliance collaborative platform, and other process and procedure improvement initiatives*."

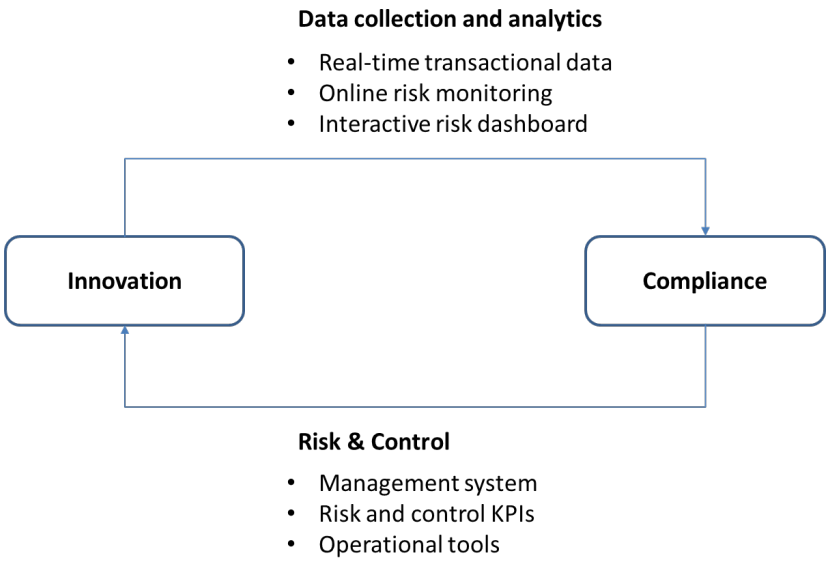

Figure 7-8: Ping An's innovation and compliance reconciliation model

When asked to provide some examples of how Ping An reconciled the dialectics between innovation and regulation in the new Internet-based finance operations, the Product Manager answered, "*In the FinTech operations, we implement transactional-based product lifecycle risk management. We incorporate risk identification, quantification, control, mitigation and reporting measurements in the transaction level. Leveraging on the supply chain transaction platform, we consolidate 'business, capital, information and logistics' flows into a comprehensive risk modelling. Based on the real-time data on the platform, we can* ***identify, monitor and control the information asymmetry risks online****. In the industrial finance operations (such as Letter of Credit), to mitigate behavioral and operational risks, we apply the* ***Internet-of-things concept to monitor the movement of mortgaged goods online****. Through the GPS location device in the tracks, we can monitor the tracks delivery route and mortgaged goods location online. In the trading finance operations (such as financing for large commodity goods), we use commodity hedge credit products to help our customers hedge risks in the futures markets. This is an example for how we make use of the structural products in the open finance markets to mitigate market, operation and credit risks."*

What were the challenges Ping An faced in reconciling the regulatory dialectics? The Risk Manager said, "***The regulation also drives change in the banking business model.*** *In 2014, the General Office of China's State Council (国务院) introduced several 'opinions' and 'directives' to regulate the debit card and credit card open markets. The FinTech firms generally run on a debit account model (specifically, mobile payment users need to deposit money into the Internet payment accounts). The credit card market is generally occupied by traditional financial institutions (specifically, banks provide credit to card users based on credit rating).*

However, the border line is blurring now. Some FinTech firms, such as Alibaba's MYbank, are providing credits to its platform suppliers and customers based on the transaction data. Banks are offering mobile payment models too (such as mobile wallet) and applying big data from trade/supply chain financing. The new regulation will regulate and imply different processing fees on debit and credit accounts payment. In general, credit account processing fee is 4 to 5 times higher than debit account. ***We hope the new regulations will help regularize the financial markets and provide a healthy competition market between traditional banks and FinTech firm.****"*

7.3.3 Financial Innovation Management

At Ping An, financial innovation management is largely facilitated by **a pro-innovation organizational mechanism and culture**. In 2012, Ping An Group established an **Innovation Center and a RMB One billion Innovation Investment Fund**. The Innovation Center's mission is to study the new business model and new technology application, help Ping An innovate, change and adopt the new technology-driven development model. The Innovation Center members have diversified backgrounds and experiences in new business start-up, venture capital, Internet technology (big data and cloud), banking operations, regulatory and business risk control. The Innovation Center helps promote internal innovation by leveraging on new technologies such as Internet mobility, social media, big data, and AI. It focuses on introducing new technologies, new concepts and new business models in Ping An to nurture new business potentials. To comprehend the technology base of Ping An, the Innovation Investment Fund is used to invest in new start-up businesses and new technologies that supplement the long-term innovation needs of Ping An such as financial technology, retail businesses, medical and health, vehicles and new media companies.

Under the new "**Integrated Finance + Online Finance**" strategy, Ping An established a **FinTech operation department at HQ** in 2013. This HQ department became the "back-end office" to develop new FinTech products, new service platforms, new business models, optimize services, enhance user experience and promote E-banking operations within Ping An Group under the "new normal". Since 2013, Ping An has developed different Internet portals for its corporate, retail, inter-bank and merchant bank clients. The **Orange E Network**, for example, is a collaborative platform developed by the FinTech operation department in 2014. The **Orange E Network** is a cloud e-commerce collaborative platform for SMEs. The platform

facilitates online commerce, payment, financing and wealth management/investment. In addition, it also integrates insurance products into the platform to enable cross-selling. The platform provides free usage to SMEs to accumulate stocks and transaction data flows. These big data will be used for supply chain finance analytics.

Ping An's innovation management process is carried out by the Strategy planning team at HQ (as innovation facilitator) and Product team at operation (as innovation developer) using a project management approach. Each innovation project has a project charter and a complete set of approvals. The project plan is coordinated across multiple teams/departments. When the product development process deviates from the original plan, the Product team will discuss the deviation with the respective party and department to work out solutions. Sometimes, the Product team needs to collect more data to justify product design and parameters. The adjustment is mainly to correct problems and push forward the development process.

According to the Product Manager, depending on the product design, the Product team needs to coordinate with different departments. At HQ level and with affiliated companies. However, the product development usually follows the same protocol as defined in the policy. The product team will perform post-mortem review to determine if the new product sales revenue and profits can meet the expectations. The critical success factors are leadership commitment and support from cross-departmental communication and coordination.

There are some cases of less successful product development, basically due to lack of inter-department coordination. According to the Innovation Manager, sometimes, different subsidiaries in Ping An Group may work on a similar product concept. Leadership encourages internal competition and will pick the best new product design. Such cases lead to duplicated efforts and less efficient use of resources. Perhaps a centralized new product concept "screening and filtering" mechanism can help. However, it may be difficult to implement as each affiliated companies and departments have their own KPIs.

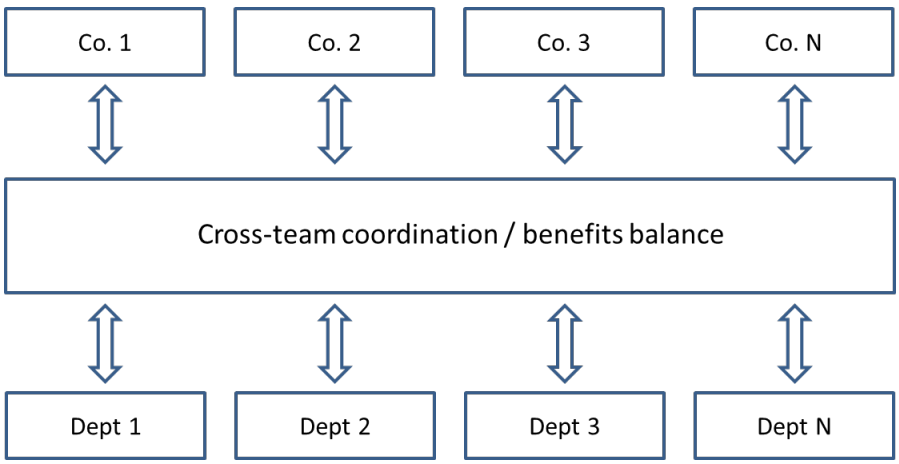

Figure 7-9: Ping An Innovation Management Approach

To improve the coordination of innovation projects within Ping An Group, in August 2013, Ping An established the **Product Innovation Committee (PIC),** which was responsible **for overseeing NPD and product launch at Ping An.** In October 2013, PIC announced the establishment of Innovation Incentive Funds to encourage its staff to engage in innovation and change within Ping An. In November 2013, PIC developed a **post-mortem innovation product assessment process to evaluate the innovation lifetime contribution values based on some standard benchmarks.**

According to the Product Manager, the leadership always encourages the staff to cultivate innovation DNA. The staff are encouraged go to the front-line and the market, interact with customers, understand their needs, identify new opportunities to innovate, develop innovative ideas and business models. **The innovation should have been able to create "technology barrier" and "comparative advantage" and help Ping An to be the product leader.** The Risk Manager added, "*Effective risk management provides a defense line to financial innovation risks and protect the interests of financial consumers. Using the new technology in big data analytics on 'transaction, cash flows, information and logistics data', we can advance the risk control mechanism to real-time monitoring. With the more comprehensive risk information and sophisticated risk modeling, new innovative products are being assessed more completely and we have confidence to launch them in the market."*

Financial-services companies are not predominantly known for innovation. So**, what are some of the strengths of Ping An's culture that have helped it succeed?** The Deputy CEO said, "*In our culture, everyone is able to speak up with new ideas or objections. There is no sacred ground that you cannot touch, and this philosophy has really helped us over the* years. **Risk taking is strongly encouraged, and failure is not stigmatized.** Over time, our hit rate on innovation has gotten better, because what we learn is that often our original instinct is correct, but our first idea of how to execute it might be wrong. But if we keep trying, understandably making a few missteps as we make our way on an unpaved path, we will eventually get there. What I have found is that with each new success, we become more confident in our abilities and our instinct to try the next big thing."

In 2012, Ping An Group acquired Shenzhen Development Bank and became **a truly integrated financial services firm offering one-stop financial service solutions to its customers in insurance, banking and investment businesses**. The Product Manager said, "***Ping An's product innovation is to fulfil the comprehensive business needs of its large***

customer base across different service lines. The integrated/bundled financial products help us improve our customer loyalty and customer lifetime value (CLV) *(CLV is a measurement of the total expected revenue from a* ***customer*** *over their entire relationship with a firm). For example, trade finance can bring terminal market customers to the bank. Credit card brings insurance customers to the banking business. Miro-financing can integrate/bundle trade finance and credit card customers together on a single platform.*"

Ping An is a technology-oriented financial institution. According to the Division Manager, "*The Internet banking will transform the traditional financing model from relationship banking to knowledge banking. Through the Internet big data analytics technology, we can enhance our risk model, which is the core of Internet banking."* For example, in October 2014, Ping An introduced online financing to supermarket suppliers. The suppliers submit their billing to supermarkets through Ping An's EDI (Electronic Data Interchange) platform. Ping An evaluate the transactional flows of the suppliers as a basis for financing approval. This helps reduce the communication and transaction costs to both Ping An and the supermarket suppliers. **The big data and cloud computing technology enable Ping An to have real-time access to their borrowers' transactional data and behavioral information, which help improve the risk control and resolve financing difficulties of SMEs in China.**

The establishment of CGI is to fill the "gap" in micro-financing which many large banks are not prepared to venture into. Applying the technology of Internet-of-things, Ping An can track the goods and shipment flows of its Supply Chain Financing 2.0, a product of Fudan University and Ping An's Collaborative Innovation Laboratory established in 2013. According to the Sales Manager, "*In the next 10 years, Ping An will expand the supply chain finance services to up-stream and down-stream business partners of large enterprise (the 1+N model). Supply chain finance can help these core customers and their related business partners solve their financing issues, help increase our business mix and intermediate business income. This is a good way to diversify the bank's revenue mix in response to the lower interest margin from liberalization of market interest rates. Besides, supply chain finance is a "safe lending" when we have move visibility and control over the goods and transaction flows of the borrowers through a one-view information platform. The CGI team provides the customers' credit portfolio to our counterparts in the banking business for sensitivity analysis and risk alert. We aim to provide an integrated digital collaborative platform for real-time sharing of information among the involved parties, internally and externally."*

During the interview, the Innovation Manager said that "*Ping An has strong execution power. The HQ bank management sets the KPIs which are then systematically tracked and*

reviewed at each level of operations. Ping An has 100 million high-net-worth customers. We perform customer segmentation to match the right customer, with the right channel, right team, right products and right services to optimize customer value and control operation costs at the same time. For example, our **Orange E Network** ***targets at the young (25~45 years old) rich middle-class Internet savvy customers****. Instead of competing with LCBs for large corporate clients, Ping An's management believes that we shall cultivate our own customer base by leveraging on our unique market proposition.*" In 2018, Ping An announced its "three-step strategy" to transform Ping An from corporate banking major to private banking major. To achieve this mission, Ping An needs to enlarge the use of E-banking among its users. **Ping An's management is committed to investing in technologies to drive innovation and change.** According to the Sales Manager, "*Ping An's financial innovation begins with the customer-centric and superior user experience perspectives. Based on the 'Internet plus or Internet thinking' model, we develop new financial products that incorporate the elements of Mobile Internet, Social Internet, E-commerce and Internet-of-things. We pay more attention to customer experience in our product design. For example, the* **Orange E Network** *developed based on a collaborative platform of "Internet + Industry + Finance" has achieved great success in terms of revenue and customer base. Within a year after launch, it has accumulated 500,000 active users in total*."

According to the Sales Manager, "*FinTech, big data and cloud computing technologies are impacting the traditional credit card business. Since 2014, the credit card business has been slowing down. New payment technologies such as mobile payment, NFC payment, QR code payment and wearable payment are replacing the 'plastic card'. These new technologies do not require credit proof and a lengthy application process. The security of these new technologies has improved a lot and user acceptance/adoption rate is increasing. At the same time, the assets quality of credit card is deteriorating. Certain places and industries are facing increased default rates in credit card payment.* ***In response to the competition challenges from FinTech firms, we need to embrace technology in our operation model, provide innovative solutions and elevate our service quality for the customer-centric philosophy and improved user experience.*** *For example, we are applying biotechnology for user identification, big data and location-based services to detect potential fraud, and credit score based on transactional data for real-time credit rating to improve risk control and customer services*."

In a press conference held in December 2018, the CEO of Ping An said, "*Ping An is experiencing complicated internal and external business environment challenges. The government is accelerating the internationalization of Renminbi and liberalization of market*

interest rates. Online financing (P2P) and payment (Alipay) are challenging the traditional banking financing and operation models. Increased peer-competition and the new entrance of FinTech firms in the traditional banking market are squeezing our profit margin. Customers are increasingly demanding and sophisticated in technology application. Internal capital pressure caused by BASEL capital reserve requirements is limiting our branch expansion. In response to all these challenges, Ping An needs to become a technologically innovative bank to make new breakthroughs in our business model and revenue mix."

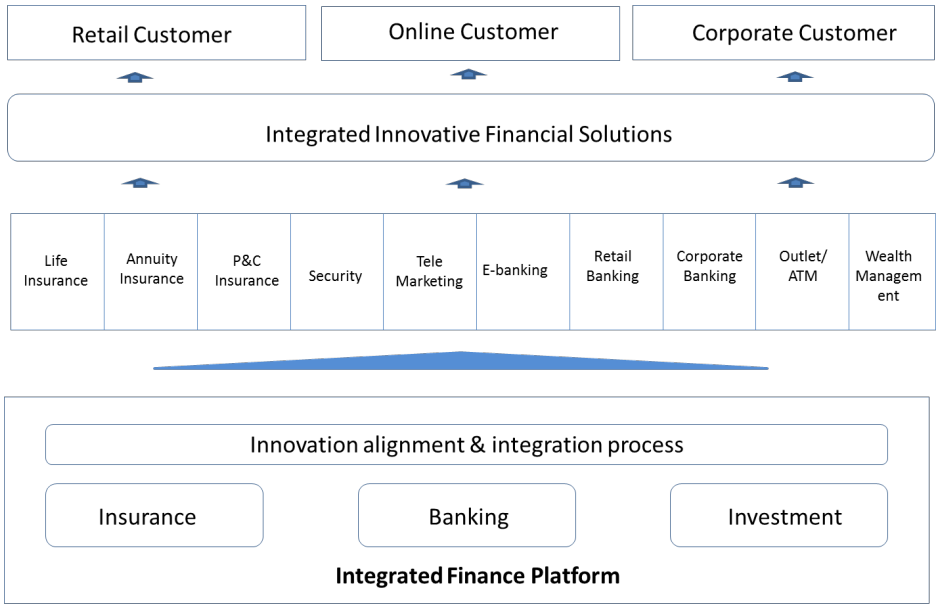

Figure 7-10: Ping An's integrated marketing and service platforms

People

In 2014, Ping An launched the "**Integrated Finance Management Trainee Program**". In this program, the Bank selects a group of fresh graduates from leading universities to undergo a **two-year management trainee program at the HQ and subsidiaries of Ping An**. These management trainees will have job rotation practice in various key functions/service lines of the bank. The aim of the program is to develop competent future leadership with integrated finance knowledge and innovation competencies. Ping An continues to attract financial talents from the market, especially from international banks and financial consulting firms to develop its own innovation capability.

Process

According to the Innovation Manager, Ping An has a strong innovation culture. The leadership encourages innovative ideas and intragroup cross-departmental/cross-organization collaboration. However, sometimes, different subsidiaries in Ping An Group may work on a

similar product concept. Leadership encourages internal competition and picks the best new product design.

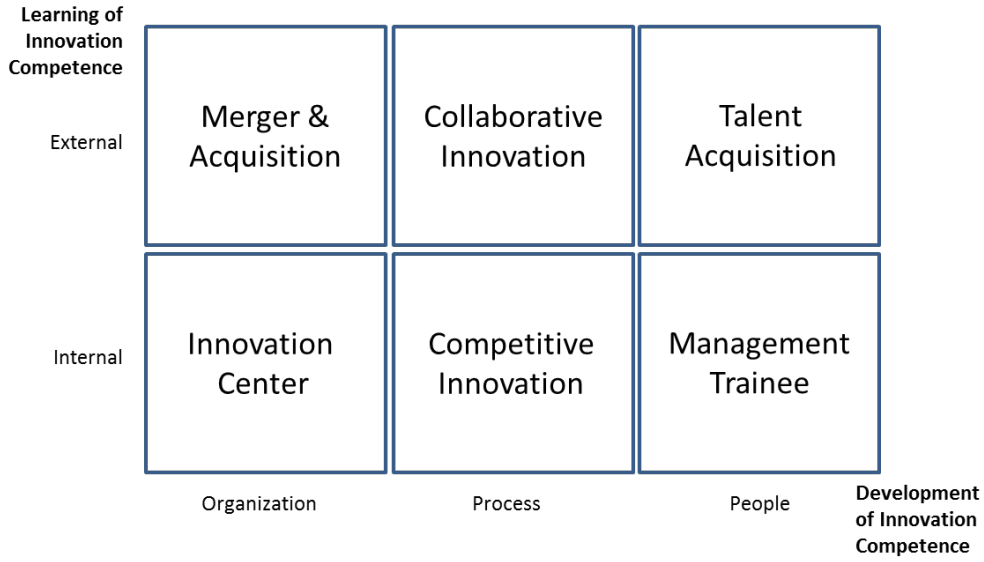

Figure 7-11: Ping An's innovation competence development approach

7.5 Summary: An Interactive Concurrent Innovation Process

Based on the above case analysis, it seems that Ping An generally adopts a "**concurrent product development process**" in its financial innovation. According to Romelaer (2015) and Nonaka's (1990) "**concurrent model with outside help**", innovation process is characterized by pluri-functional groups, elastic phases, upstream relations with suppliers, downstream relations with clients (co-develop), mutual investigation. Solution are developed where and when the problem is perceived, and managing trust is placed in the development team. The advantages of this innovation process include rapid development time (important if Chrono-competition), leveraging on the competencies in suppliers and clients; and developing flexibility in the workforce. However, there are many potential problems and difficulties, which include challenges in the informal coordination between phases, execution risks if formal planning is superior to "informal negotiation/adjustment", and political risk if the informal process kills the formal one. Therefore, the management needs to exercise extra care in concurrent development process which allows for increased mutual adjustments, additional explaining and "re-doing", thus sourcing suppliers and clients while developing and stabilizing relations (Romelaer, 2015)

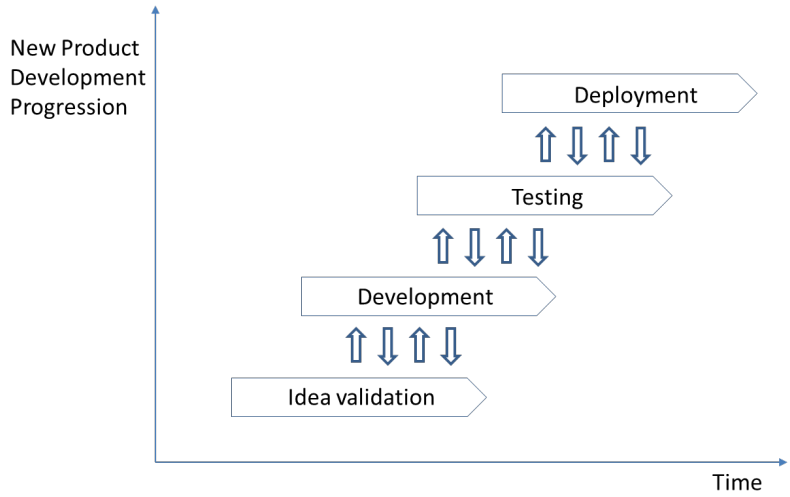

Figure 7-12: The simplified scheme of Nonaka's (1990) "Concurrent Engineering"

Source: Adopted from Romelaer P. (2015)

According to Nonaka (1990), the process of innovation generation is a "problem generation" or "information creation model"…" Every phase of innovation generation is loosely connected and overlaps, expanding and contracting with the unrestricted elasticity of diversity". In this innovation model, redundancy, overlapping and diversity are notable characteristics and realized through the multi-functional nature of the project members. Based on empirical materials collected, the innovation at Ping An is cross-disciplinary actions and requires high levels of integration at both intra- and inter-firm levels. The focus is on integrating processes and products, sharing tacit knowledge across platforms to develop "total concepts" for the combined business. The key element of this model is a collaborative, concurrent, multidisciplinary and efficiency-driven culture. The "parallel and integrated nature" of development process is related to external help with strong supplier/partnership/alliance linkages established as well as close coupling with leading customers. With this novelty, Ping An continues to merge and acquire complementary business units to enrich its innovation generation power. Information redundancy entails functional overlapping. At Ping An, the overlapping nature can be evidenced in functional groups, the organizational network of the parent company, affiliated companies or subcontractors. According to Nonaka (1990), at the heart of this innovation model are the cooperative utilization, trusted relationship and learning through problem generation (learning by intrusion).

According to Romelaer (2015), the key benefits of this innovation model are short-time-market, effective utilization of the competencies of suppliers, affiliates and customers, optimized knowledge sharing and development of flexibility in workforce. These are important to a fast-moving and increasingly competitive business environment in China today. However,

with the large amount of information redundancy and functional overlaps, this innovation model requires enormous amount of mutual adjustment, explanation and possibly "re-doing", finding suppliers and clients, as well as developing and stabilizing relations. According to Nonaka (1990), regarding the sharing of information within a close and interactive group, information redundancy gives rise to loyal relationships which function to suppress the generation of opportunism. Therefore, building a trusted relationship is key to the success of this model. Key issues inherent to this model are risks with the informal coordination between phases (sometimes misunderstanding and information leakage); risks if formal planning is superior to informal negotiation/adjustment (sometimes authority/formality supersedes trusted relationship, it is called "group think" by Nonaka); and potential reverse risk if the informal kills the formal (excessive chaos may eventually destroy the institution/institutional arrangement). Finally, this kind of innovation model is suitable for organization with the following characteristics: (1) conglomerates or combined businesses with diversity and a loose coupling structure creates opportunities for business synergy through information sharing; (2) an open innovation environment to incorporate suppliers, customers and affiliates in the "problem generation" or "information creation" process; and (3) effective trust and teamwork management to establish an information and knowledge-creating organization.

This innovation model featured by concurrent processing with outside help is suitable for Ping An and aligns with its innovation strategy of becoming a "technology-driven" integrated financial service group. Innovation is in the DNA of Ping An, which believes that one must change to live and innovate to live better. Leading integrated finance with modern technologies is one of the two strategies of Ping An for the coming decades. As a result, Ping An has been actively engaged in merger & acquisition activities to enrich its service offering and innovation competency. It also set up an innovation laboratory and a one-billion VC fund, which is dedicated to venture investment in new ideas and start-ups out there. Ping An's innovation strategy is not to "develop a perfect product" but to quickly launch a product and continue improving it. On this basis, Ping An is adopting a "parallel lines innovation model" with outside help from its acquired affiliates. This innovation model emphasizes on a cross-disciplinary actions and requires high levels of integration at both intra- and inter-firm levels. The focus is on integrated processes and products to develop 'total concepts' - One Customer, One Account, Multiple Products, and One-Stop Services. Externally, strong supplier/partnership/alliance linkages are established as well as close coupling with leading customers. The overall objective is to build an 'integrated finance business ecosystem' by leveraging on Ping An's large customer base in Insurance and Banking businesses. Therefore, a concurrent engineering model with

outside help is suitable for Ping An for a converged innovation development path and efforts.

However, a closer examination of Ping An's innovation process reveals that it is a not a pure "Nonaka concurrent engineering process". With its key principle being "Information Redundancy", the Nonaka model does not match or accurately reflect Ping An's innovation process for a number of reasons. First, Ping An does not engage its suppliers or customers in the innovation process. Instead, it involves members from related/associated companies in the idea validation and product generalization & diffusion process. Horizontal instead of vertical (up & down stream) innovation integration is exercised in Ping An. Second, the Nonaka model does not explain how financial innovation and regulatory dialectics are reconciled. Regulatory compliance and risk management are critical components in the financial innovation process. Communication with regulators (pre, during and post-innovation process) is constant and may significantly alter the innovation process. Third, Nonaka assumes that the acquisition of a great amount of information becomes more important than the relationships among the various individuals, and the individual who brings forward the most critical solution has the authority to give orders. While this might be right in an engineering or manufacturing environment, it is not applicable to Ping An where hierarchy, specialization and seniority respects are still very influential in the innovation process.

Ping An's innovation process aligns with Nonaka's parallel processing concept in several ways. First, Ping An's financial innovation phases are loosely connected and overlap, expanding and contracting with some elasticity in member/functional diversity. Information sharing is promoted in the innovation generation process. All in-project members become sensitive to changes in the market and its areas of specialization and constantly add knowledge to or share knowledge with the product development. Second, some conflicts occurred over specifications, costs, and deadlines. The conflict resolution adopts that "the best way (to achieve an objective) is through thorough balancing between 'innovation and regulation' opposition and conflict." Through effective communication with regulators and an in-depth understanding of regulatory motives, the dialectics are reconciled and a feeling of group identity in creating an innovative/value adding product is transpired. Third, when supplemental information is shared within a cooperative and tight-knit relationship, questioning is normally perceived less hostile and good ideas are generally well received in Ping An. This has somehow reduced the barriers to innovation/creative ideas.

So, what is Ping An's innovation process then? It is suggested that Ping An adopts an "Interactive Concurrent Innovation Process", a blueprint from Nonaka's concurrent development process with a number of variations to fit into the Chinese organizational

environment. The “Interactive Concurrent Innovation Process” begins with a new idea entering into an interactive development loop, which is evidenced by multifunctional representation, multidimensional coordination/communication, elastic development phases, circular idea perfection, mutual support and an internal check-and-balance mechanism. The “Interactive Concurrent Innovation Process” ends with completion of product test and enters into the deployment process. The product team continues to observe and evaluate the product performance in the market. Some minor adjustments may happen to generalize the product to meet larger market needs. Over time, the product team will accumulate feedback and enhancement requirements from front-liners/customers. Once enhancement needs are prioritized, the product will begin a second round of interactive development loop.

What are the benefits of this innovation model? First, the current model increases lead-time precision, product quality and compatibility through the inclusion of related functionalities and parties in the early stage of innovation. Interactive contribution and adjustment to the product from idea generation to final product deployment help shorten the time-to-market and increase product acceptance. Second, it reduces development cost and rework by building a common operational platform and adopting parallel processing and multitasking in the development activities. Concurrent engineering of development activities helps shorten the development cycle time. It is a fundamental competitive advantage for Ping An to quickly adjust its product catalogue to meet its diversified and rich customer portfolio. Third, by integrating its upstream companies (insurance and credit guarantee) and downstream companies (investment, security and financial asset exchange) in the product development cycle, it helps create financial solutions that can optimize cross-selling in a total concept. It also helps to ensure that the products are more aligned with the overall business strategy

The current model also enables Ping An to rapidly develop “product prototype” within a short timeframe and test it in its “regulatory sandbox laboratory”. It helps the product team to validate the conceptual design early in terms of risk impacts and financial stability implications. Such early self-validation results help regulators understand the new product design and the bank’s internal stress-test implications. Obviously, the transparency can help and smooth out the product approval process.

What are the difficulties with the current innovation model? First, parallel processing increases the communication time and cost across functions and organizations. The informal communication may increase stress and political pressure between people, functions and organizations, especially when two parties are engaged in similar or competitive NPD activities. Second, IT systems may well be able to automate and speed up operations. While IT may be

able to support lower level routine tasks, it is unlikely to substitute human interactions, team building, group work and the leadership required in successful product and process innovation. Third, without accompanying organizational changes and supportive collaboration incentives, the implementation of parallel processing can be a costly and inefficient exercise that can lead to worsened rather than improved performance. Fourth, the concurrent working team must have the tacit knowledge about the other functions/organizations before they can contribute to the development. There is a great deal of training and coordination work involved before the development speed can pick up. Finally, it is costly to develop and maintain such a large common platform. Expertise with relevant knowledge in multiple channels is difficult to source and retain. Technology specialists in IT and data science are short and hot in the market due to the rapid growth of FinTech in China.

Finally, what types of actions look promising to strengthen the innovation process? First, the top management plays a key role in sponsoring and also in criticizing and shaping the innovation. The product manager/project sponsor shall be endorsed by relevant authorities to obtain and align resource contributions from other functions and organizations. Second, criteria for success shift over time and differ between groups. Therefore, the criteria for success, as well as the project charter, shall be agreed upon by all involved parties before the formal kick-start of the project/product development. This is to avoid conflict of interest and avoid making the innovation an unnecessary political process. Third, innovation involves learning and other events/by-products can occur as a result of the innovation. In such cases, formal training and informal team building can be arranged before and during the entire innovation process. This can help improve the internal cohesion of the multi-disciplinary team.

To summarize, the advantages of this innovation process include rapid development time, leveraging on the group's competencies as well as its large and diversified customer base, flexibility and recognition in teamwork, and product generalization for larger application diffusion. However, there are many potential problems and difficulties, including challenges in the informal communication, competing projects, over-stressed workforce (when one participates in multiple development projects) and ambiguity in dual-line reporting. To overcome these challenges, Ping An needs to redesign its organizational/functional/individual KPIs structure to recognize normative contribution and innovation development, construct an IT platform to optimize knowledge/product/customer integration across organizations / functions, establish a lean organizational structure that allows/encourages voluntary innovation contribution without the fear of outperforming.

Valle and Vázquez-Bustelo (2009) identified overlapping activities, inter-functional integration and teamwork as three positive factors influencing NPD performance. They drew a conclusion that the use of Concurrent Engineering innovation development method should be contingent to the context or conditions which characterize each innovation process and the order of priority given to the objectives pursued. In the case of Ping An, it can be concluded that the management effectively leverages on a parallel processing method for rapid product innovation development. Meanwhile, it makes use of an "interactive development loop" method to optimize innovation generalization for its large and diversified customer base. The "interactive development loop" also applies in the incremental innovation process.

The iterative loop model is suitable for Ping An, as the innovation decision is coordinated, interactive and fast-tracked to meet market needs. Innovation development at Ping An shows an evolutionary model in which change is a repetitive sequence of variation, selection and retention events among entities in the population. As Van de Ven and Sun (2011) pointed out, diverse variations are more likely to produce innovations.

The next chapter will move to the innovation process analysis of FinTech firms. Alibaba's 'MYbank' (sometimes, people call it Ma Yun ('MY") or Jack Ma's Bank) will be analyzed first.

Chapter 8: MYbank Case Study

Alibaba-backed MYbank was established in 2014 with an initial paid-up capital of RMB four billion. MYbank's approved scope of business include carrying out deposit and lending transactions for the public as well as monetary settlement for international and domestic transactions. MYbank is an all-in-one digital bank, which only operates within the Alibaba online e-commerce platforms (T-mall and Taobao). Its key customers are the platform retailers who struggle to get financing from traditional banks due to the lack of mortgage assets and platform customers who need short-term financing but lack a credit rating records at traditional banks.

As the first "cloud-based bank, MYbank does not have any physical branches or service centers in major cities, provides no cash transaction service, and has no offline service teams. According to Alibaba's official statement, MYbank provides inclusive and innovative financial solutions for individuals in both urban and rural areas and for SMEs. The Bank Manager said, *"MYbank will not touch the 20% high-net-worth value customers. We insist on "long tail" effects, leveraging on the 80% medium to low-net-worth value customers, especially SMEs, online traders and consumers, particularly in rural areas. We will not touch financing business for loan amount exceeding RMB five million per single customer. We insist on a 'small deposit and small lending' approach (mainly providing deposit product of less than RMB 200,000 and financing product of no more than RMB five million) to diversify risks and penetrate into the niche market by leveraging on our cloud computing platform and big data analytics capability."*

Below is an organizational structure of Alibaba group. Alibaba's business scope is divided into four key segments, namely, online purchase platform, FinTech, culture and entertainment, and technology. MYbank is part of the FinTech segment and is closely linked to online purchase platform for business applications and market channels.

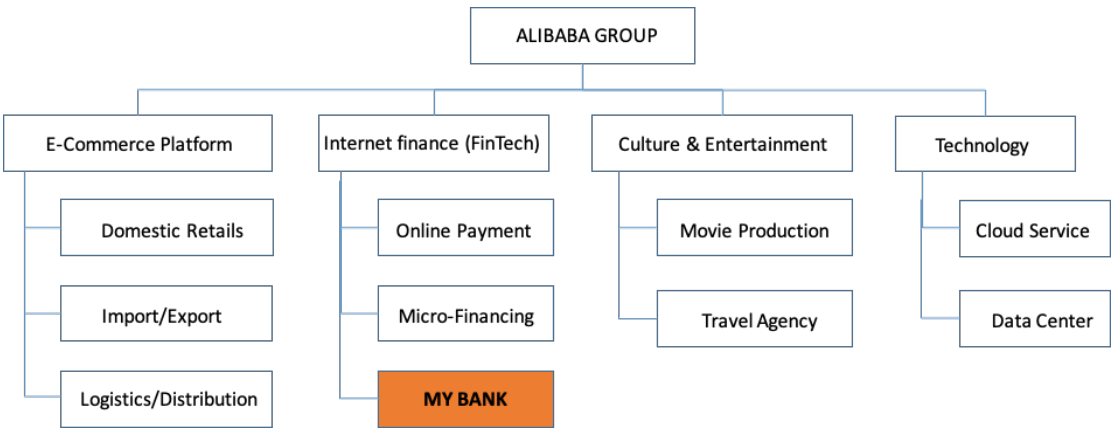

Figure 8-1: Alibaba Group Structure - MYbank

Before the establishment of MYbank, Alibaba had been venturing into the financial services industry through offering mobile payment, monetary fund investment, credit and trade financing through its online purchase platform. Below is a summary of key activities undertaken by Alibaba before obtaining a private baking license to establish MYbank.

How is FinTech linked to online purchase platform and technology (cloud and big data)? The diagram below describes FinTech ecosystem of MYbank which includes monetary deposits, monetary fund investment, monetary transfer, credit, consumption and trade finance.

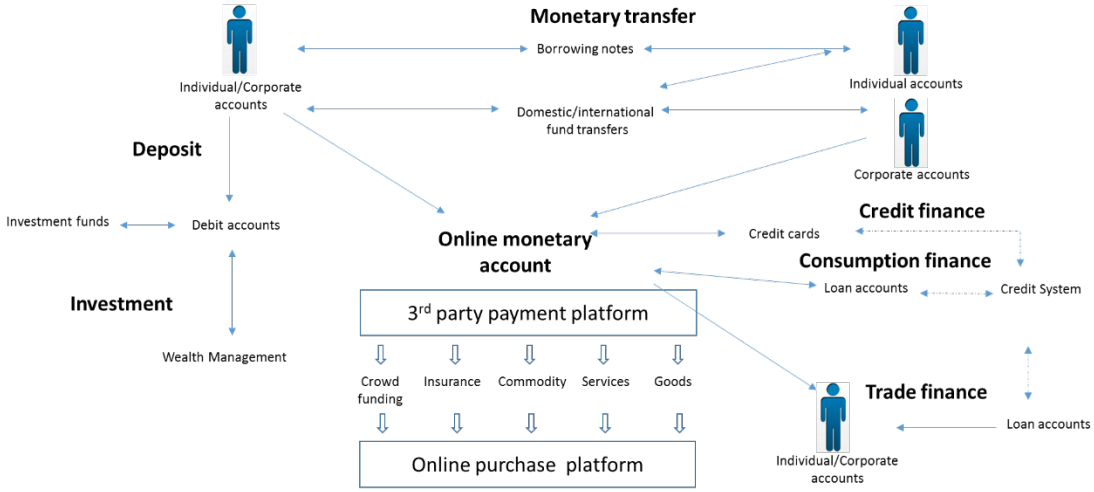

Figure 8-2: The FinTech ecosystem of MYbank

Source: Author's analysis

First, when a user needs to make an online purchase or monetary deposit, the user will have to first transfer money from a personal bank account into Alibaba's online monetary account. If the user wishes to earn an interest income from the online monetary account, he/she can transfer the money into an online debit account which is linked to a third-party investment fund. A daily interest will be calculated based on the balance in the debit account on an above-average bank deposit interest rate. Alternatively, the user can also buy WMPs based on an asking rate. The platform helps match the monetary offer and demand based on the asking rate and investment period. Once a match is found, the user will need to transfer money from a personal account to the investment account in the wealth management platform. Daily transfer-in amount is restricted by the traditional banks (a maximum of RMB 5,000 per day and RMB 50,000 per month). However, there is no restriction on transfer-out amount. The user can request for early maturity of wealth products with a nominal penalty.

Users can set up individual or a corporate debit accounts on the platform. They can perform domestic and international funds transfer through their online debit accounts. Since Alibaba's mobile payment account is becoming popular, many users are using this platform to transfer small amounts of cash. The monetary transfer process is in collaboration with traditional banks and needs to comply with the relevant regulatory requirements on funds transfer. Besides online funds transfer, users can also borrow/lend money to friends through the online debit accounts. Interest and maturity period are mutually agreed by both parties. The platform help generate a borrowing note to support the P2P lending actions. A new form of digital payment through QR code (Tencent) and online debit account (Alibaba) is becoming popular in China. Many restaurants and small businesses are offering cash discounts to consumers when they use QR code or online debit account to make small payments. This has helped the small businesses become more efficient in cash management and payment receipt process.

Through the online debit account, users can make mobile payment for purchase of goods/services, payment for insurance and utilities, and joint crowdfunding activities. Using the big data collected from its online purchase platform, Alibaba generates a credit scoring system for its users. Users can check their credit rating on the online platform. Based on the credit rating, MYbank offers trade financing to the online traders/suppliers, credit (instalment payment) and consumption financing to the online buyers. In short, MYbank is building a "digital monetary ecosystem" to facilitate the transformation of "paper note" and "physical banking" transactions to a "digital money" and "virtual banking" experience.

MYbank is a private bank (in other words, all of its shareholders are private firms) providing financial services over the Internet (or commonly known as "FinTech" or "FinTech" services) to SMEs and online consumers. Therefore, the discussion of MYbank will begin with an overview of private banks and FinTech development in China. What opportunities or menaces did these developments bring to MYbank?

8.1 Business Environment

Following the decision at the 18th Central Committee of CPC (November 2013) to deepen the financial system reform, the Chinese government started to seek measures to ease restrictions in the traditionally state-dominating banking industry. In March 2014, CBRC finally approved a trial program to establish ten private banks. The first five pilot batch private banks were to be established in Tianjin, Shanghai, Zhejiang and Guangdong Province. According to

CBRC's chairman, these private banks would primarily serve "SMEs" and they would "let capital speak," meaning that funds would be allocated to the most productive users rather than those with strong political ties, and the banks themselves shall be "solely responsible for the risks incurred." "*While private banks are subject to the same regulation as other banks, they should also have their own characteristics, especially focusing on serving SMEs,*" said the CBRC chairman.

Industry analysts hailed the opening of private banks as an important step to liberalize interest rates and increase competition within the banking sector. According to my observations, technology firms are also uniquely positioned to utilize modern technology and big data to lower cost and better assess risks, putting pressure on state-owned banks to follow the mainstream. Yet the industry analysts are also questioning whether the new set-up can indeed offer better financial services and quench the capital thirst of SMEs, one of the primary purposes for which the private-sector banks were created. The key issue with these new startups was the lack of operational experience in financial services. Only two of these firms had rolled out financial services products on their online platforms previously. However, operating an actual bank requires a unique set of expertise which none of these companies possessed, not to mention that China was already in shortage of banking talents, said an industry analyst.

Economists have long decried the tendency of China's state-dominated banking system to grant loans primarily to large state-owned firms, even though SMEs account for 60% of the national GDP and around 75% of new jobs. According to my interviews, many practitioners doubt that the private banks have any incentive to serve their primary purpose of funding SMEs because of the high risks and high costs associated. On the one hand, unlike SOEs and large private enterprises that are key sources of local GDP growth, SMEs are never "too big to fail" and therefore low on the government's priority list. Banks always assume an "implicit guarantee" from government on loans provided to SOEs or large corporations, despite low interest return. On the other hand, SMEs are less risk resilient to economic turmoil and market adjustment. The NPL ratio of SMEs in 2016 was 6.0%, which was much higher than the national average of 2.5%. Foreign banks have made little headway in funding SMEs despite the fact that many have eyed SMEs since their entry to China. "*It is just not financially economical to lend to these guys (SMEs)*", said an industry analyst. According to my interviews, most bank officials commented that even if regulators actively promote FinTech and private banks, SMEs' financing difficulties cannot be resolved in the short term. However, will it change in mid to long term?

There are two contrasting opinions on the possible impact of FinTech on traditional banks: (1) It will disrupt the entire commercial banking landscape; or (2) It will not undermine

commercial banks' dominance but will add an innovative distribution channel to the brick-and-mortar banks.

The advocators of the former view said that Chinese traditional banks have many legacy issues, including (1) high transaction and operation costs; (2) a NPL up-cycle due to heavy debt from local government financing vehicles (LGFV); (3) a narrowing interest rate gap; and (4) competition pressure from foreign banks. The emergence of FinTech is threatening traditional banks' fees income and net interest margin. For example, online third-party payment is breaking the existing profit distribution model for bank card fee income, and online WMP distribution platforms are taking market share from banks on funds/insurance/trust distribution and hurting banks' agency fee income. In the long term, big-data supported Internet consumers/SMEs will exert pressure on banks, and may significantly disrupt their current operational matrix, organizational structure and risk management framework.

In comparison, the supporters of the latter view said that traditional banks have longer operational track records, greater capital strength, and mature regulatory and risk-management frameworks. Although some, not all, leading FinTech providers have resources, such as networks, client bases and technologies from their existing Internet business, they are inexperienced in risk management and subject to future regulatory pressure. In addition, FinTech firms face the challenges of regulatory barriers, an incomplete credit rating system, immature risk management and capital constraints. There are not immediate solutions to these problems / limitations. Therefore, FinTech will not undermine the conventional banking system, but will drive its transformation and diversify the financial sector ecosystem.

According to the author's observations, to win the game, neither party can work alone. FinTech providers will not become significant market participants unless they incorporate capital and risk management strengths by learning from and partnering with conventional banks. For example, MYbank has been working with traditional banks to develop and distribute financial products through its online platforms. Likewise, traditional banks need to embrace Internet technology and big data and integrate an Internet strategy in their operations to stay competitive in the age of Mobile Internet affluence. For example, FinTech providers may expand and develop their expertise in microfinance and standard low risk retail products, while traditional banks may continue to develop their high-end, customized, large-to-medium corporate and institutional business.

Table 8-1: Competitive strengths of traditional banks and FinTech

	Traditional banks	**FinTech**
	Strengths	**Weaknesses**
Market confidence	Long operational track records with high confidence from the general public	Relatively short period in operation and a greater possibility of credit events; (massive decommission of P2P loan platforms in 2016-2018 in China).
Capital strength	Large existing sum of deposits and invested capital	Relatively low accumulated capital
Regulations	Higher regulatory standards; those deemed 'too big to fail' could gain government support in extreme circumstances	Possible regulatory pressure in the future; possible threat from interest rate liberalization as the attractive interest rates paid to the investor could be matched by banks if the latter were deregulated.
Risk management	Expertise in risk management and developed frameworks	Inexperienced in risk management, vulnerable to systematic shocks
Credit information	Substantial information on credit-worthiness of clients in financial systems	Inadequate information accumulation
Product design	Abundant experience in complex and structural financial products	Inexperienced in complex product design
Service Differentiation	Still have control over large corporate and institutional business	Mostly confined to SME and individual business with relatively high credit risk
Client base	Lack of access to online users	Online-shopping has become increasingly popular; easy access to a large number of Internet users with high customer loyalty
	Weaknesses	**Strengths**
Cost efficiency	High costs due to large and complicated	Low operating costs and high efficiency

	operational structures	channel maintenance
Flexibility/innovation	High entry barriers mean lack of competition, and hence little motivation for innovation; too big to advance structural transformation	Quick to adapt to institutional transitions and also adaptable to intense competition
Interest rate regulations	Regulated interest rates cause fund outflows to alternative financial investment vehicles.	Relative flexibility in price setting
Information processing	Lack of a real-data reserve relating to daily information	Real data accumulation from e-commerce platform; high efficiency information processing

Source: UBS, 2014

For MYbank, the lack of experience in financial services poses a considerable challenge. However, utilizing modern technology and big data to lower cost and better assess risks could help MYbank shorten the learning curve. Besides, since MYbank does not have ATM nor physical outlets, it does not handle "cash notes". All the cash-in and cash-out transactions are to be completed with the user online account linked with an actual bank account in the traditional banks. On the one hand, MYbank is competing with traditional banks. On another hand, MYbank cannot live without traditional banks. So, how does MYbank formulate its business strategies in response to these challenges/opportunities for such a strange relationship with traditional banks? Cooperate or compete?

To understand the business environment of MYbank, perhaps it is important to first ask the question of "what are the differences between Traditional Banking and FinTech, in terms of their customers, channels and operational models?" According to MYbank's deputy Branch Manager, there are a few key differences, which are summarized in Table 8-2 below.

Table 8-2: A comparison between traditional banking and FinTech

Comparison domain	**Traditional Banking**	**FinTech**
Shareholder background	The majority of key shareholders are government agencies, trust and institutional investors.	The majority of key shareholders are IT firms, new startups and venture capitalists.

Business mission	Profit maximization and risk minimization. Focus on large corporation, SOEs and high-net-worth customers.	Online user volume and traffic maximization. Acceptable to moderate risk. Focus on SMEs and low-net-worth customers.
Core activities	Engage in transactional banking, investment and trust (some also engage in insurance).	Engage in online platforms (social media, third-party payment or online purchase) to provide individual financial services.
Innovation	Product-centric. Follow a formal & rational innovation process. Careful planning and extensive testing of the new product before formal launch.	Customer-centric. Follow an agile and recursive innovation process. Continued adjustments / enhancements to business application program over a long period of time.
Formality & organizational structure	Formal dress code and operating procedures. Formal culture and hierarchical / bureaucratic organizational structure.	No formal dress code. Flexible operating process, but customer service interface/experience is pre-programmed. Relax/Informal culture and flat organizational structure (lean operation).
Working culture	Top-down driven. Take direction/instruction from leadership and superior. Employees are generally reactive, less sensitive to market dynamics and more resistant to changes.	Bottom-up driven. Employees are encouraged to contribute ideas and participate in decision making. Employees are generally more sensitive to market dynamics and more willing to change.
Service offering channel	ATM, E-banking and interpersonal services	Over-the-Internet services
Expansion method	Establish a branch network for geographical coverage. Expansion depends on availability of human capital and market opportunities (and sometimes political/social support). Expansion is restricted by capital requirements (Basel accord)	Extensive use of big data, cloud computing and mobile Internet to extend customers reach. No physical, human resources or capital restrictions. 24 X 7 non-stop service provision over the Internet. Expansion restricted by

		Internet availability and technology adoption rate.

Source: Author's analysis

Are there any market entry barriers to FinTech firms in China? Generally, FinTech firms engaged in financial service operations are subject to the same regulatory compliance requirements as traditional banks. However, lapses in legislations over new forms of FinTech operations continue to be identified and regulated. Most FinTech firms are offering specific FinTech products/services to users in specific industries (a niche market strategy). Only a handful of FinTech firms, such as MYbank (by Alibaba) and WeBank (by Tencent), are capable of offering full-range financial services to the public, for which private banking license is required.

Despite the above comparison, what are the key characteristics of MYbank? According to the deputy Branch Manager, first, MYbank is based on customer behavior and real-time transactions analysis to identify customer requirements and credit standing. It applies cloud computing and big data analytics for individualistic analysis. Based on this, tailored-made product and pricing are developed for specific customers. The credit score and price discrimination can be applied to specific customers based on the risk and costs in providing the financing. As opposed to MYbank, most traditional banks can only perform large-volume segmentation analysis. They can identify the needs and pricing for specific customer segments, but not individual. Therefore, they can only offer segmented financial products but not customized products. Second, MYbank focuses on data analysis and business insights. New product applications are developed based on gaps identified in the big data analysis. Traditional banks, on the other hand, focus on transactional processing and compliance. NPD is based on market demand or customer requests collected from market study or relationship managers. Third, traditional banks provide interpersonal guided services while MYbank provides user-interface self-services.

The current model of MYbank is not profit-oriented/optimization. Is this against the organizational theory of maximizing shareholders values? According to the deputy Branch Manager, the profit sources for traditional banks in China are interest gaps, although this is narrowing now, and traditional banks need to explore more intermediary banking businesses for new sources of profit. However, MYbank's profit comes from the transaction volume generated from the user traffic on the platform. The larger user-base and usage volume a platform has, the more influential and attractive the platform is in the market, and the higher

platform value and chances to make profit it will have in the future. It is the business model innovation that MYbank will "overtake" the traditional banks in the new information age.

However, MYbank and traditional banks are not direct competitors. In fact, they complement each other to serve the financial needs of different markets. Traditional banks' key customers remain SOEs, MNCs, large corporations, and high-net-worth groups. Comparatively, the key customers of MYbank are SMEs, villagers, SME financial institutions and low-net-worth groups. Therefore, MYbank does not directly compete with traditional banks in common customer segments, but chooses to serve niche markets. Each of them serves a distinctive market/different customer segment but both can collaborate with each other at the same time. For example, traditional banks have a large amount of sundry deposits from the public. Apart from lending to large accounts, they can also lend the surplus funds to MYbank. Then MYbank can lend to SMEs which are excluded by traditional banks due to the lack of credit info or security/mortgage for loans. Applying the big data on their transactional platforms, MYbank can generate credit score cards for these customer groups that have been neglected by traditional banks. The Bank Manager added, "*Another potential collaboration between MYbank and traditional banks is that MYbank can analyze the exported transaction data of SMEs on Alibaba platform. Based on the big data analytics result, MYbank can advise traditional banks on the credit worthiness of these SMEs based on real-time exported transactions and may collaborate with traditional banks to provide unsecured unguaranteed credit financing to these SMEs. We are happy to share big data with traditional banks for the benefits of total market growth."*

How do the public (potential lenders and depositors) know about MYbank's operations? Alibaba and related companies are promoting MYbank to potential banking customers on their online platforms. MYbank offers supply chain financing and cash management services to platform traders. MYbank pre-calculates credit scores for SME traders. According to the Deputy Bank Manager, the financial service development in China can be divided into three key phases, namely, 1.0 (Interpersonal service); 2.0 (ATM and E-banking); and 3.0 (no branch and no ATM, or E-channel and ever-ready self-servicing). For example, MYbank's pre-granted credit scores allow real-time usage of financing when users need it. Users can purchase raw materials or finance account receivables with no additional financing request or approval – all are pre-approved. Most of the users are not even aware that they are using MYbank's financing and cash management services. MYbank also provides lending to end-consumers (namely, consumption financing) or offers short-term deposits/WM investments.

However, MYbank is not without any challenges at all. What are the challenges of MYbank in the Chinese e-commerce and regulated banking business environment? According to the

interviewees,

- Firstly, MYbank is a young bank (it was established and started operation in June 2015) and therefore lacks skills/expertise in running banking transactions. MYbank, up to December 2019, only operated simple individual/private banking transactions such as online fund transfer, small amount credit/financing and online sales of wealth management/insurance products. More sophisticated/advanced banking such as trust, cash pool, secured loan/financing, securitization and corporate banking are not in scope yet. Also, MYbank needs to learn the financial regulations for banking operation and product compliance. It takes time to understand the regulators' favor and some unwritten practices. Chinese regulation is principle-based and leaving some room for the provincial/municipal-level regulators to define the detailed requirements according to the domestic situation. In this context, MYbank needs to learn and understand the "unwritten rules" and "rules of the game" like the traditional banks did in the past 25 years.

- Second, MYbank chooses to target the SMEs and low-net-worth customer segments. These customer groups are of high risks and mostly require unsecured mortgage/credit. Although MYbank is backed by its big data analytics capability, it requires a learning period to understand the key variables and develop the risk model for each individual customer, and therefore the product/risk score is to be tailored for each individual customer. Developing a sophisticated risk modeling is not a one-day job. Instead, it requires actuarial science and deep understanding of the individual and his/her business environment or industry development. Besides, provision of unsecured mortgage/credit means that MYbank is going to take a higher risk than traditional banks. According to the Basel Accords, this is high-risk asset and would require a high capital accord for default risk protection. Since all transactions are made online without individual and document vetting, all these "phantom" customers can be fake or "un-locatable".

- Third, China's FinTech businesses experienced a rapid growth in 2013, 2014 and 2015. Many new forms of online financial service firms and business applications such as e-commerce, P2P lending, online WMPs and mobile payment were developed. However, regulation for FinTech lagged behind. Regulators adopted a tolerance approach to promote financial innovation. As a result, some of these new IT/FinTech startups took advantage of the regulatory arbitrariness to explore/exploit the regulatory boundary. Some new innovations helped resolve the financing difficulties of SMEs, but some "unscrupulous" innovations resulted in financial disasters due to the run-away of owners or the bankruptcy of platforms. The lack of governance body and regulatory clarity posed challenges to the FinTech

development. Provinces adopted different approaches to FinTech innovations. Some were conservative while others aggressive. Regulatory disparity resulted in unequal treatments to new FinTech innovations.

- Forth, traditionally the public expect the government to provide "implicit guarantee" on their investments in financial service firms. Whenever there is default in repayment from investment (although the agreement clearly stated that the investment risks shall be assumed by the investors), the public will usually put pressure on the government to guarantee the repayment. Although the government imposed deposit insurance on the traditional banks for deposit up to RMB 500,000 per account, the general public still considers the traditional banks more "trustworthy" due to the fact that their main shareholders are government or government agencies (such as Employee Provision Funds), and that the capital reserves with the central bank and its "physical assets" can be easily seen by the public. Besides, FinTech firms are principally IT firms with no linked interest with government, capital reserves or physical assets. Therefore, most of the general public (except for the new digital-age young society) consider FinTech firms unsecured and untrustworthy.

In response to these challenges, how did MYbank adjust its business strategies to improve its core competency and competitiveness in the market and in relation to traditional banks?

8.2 Business Strategy

According to the Deputy Bank Manager, **the business strategy adopted by MYbank is differentiated competitive advantage – cost, data, channel and customer advantages.** What makes MYbank more cost-competitive than traditional banks? The interest gap has been narrowing in China following the interest rate liberalization policy. Traditional banks are facing issues of high operating costs in terms of system maintenance, network communication, human capital and the rental of premises. MYbank is using new self-developed information technology to serve more SMEs at reduced transaction costs. MYbank continues to innovate new applications/products targeted at those considered by traditional banks to be of high costs, high risks, ineffective to reach, unable to identify or to whom there is no specific product to sell. Leveraging on the wide mobile Internet coverage and high technology adaptation rate in China, MYbank is not only helping address the financial exclusion issue in China, but also changing the overall landscape of China's financial system by pushing the traditional banks to engage in innovation and transform from product-centric to customer-centric development.

According to the Bank Manager, "*For sure, putting banking services online is no longer a cutting-edge technology. However, MYbank is the first online bank that completely got rid of the so-called "IOE system". In other words, MYbank is the first bank that stopped using IBM minicomputers, Oracle Database and EMC storage. Instead, Alibaba developed its online banking system by itself. If we compare developing MYbank to building a house, then AliCloud is similar to the foundation of the house, while all kinds of models, including customer model, accounting model and product model serve as the outline of this significant 'house'. At the same time, the sophistication, preciseness and adequate safe-control measures provided by these models make MYbank an all-around online bank*".

The CIO of MYbank added, "*By putting our services online, we get to cut out the expensive processes and systems that traditional banks used to deal with. MYbank uses cloud computing rather than internal IT systems, which could have cost traditional banks hundreds of millions of RMB in the past. With the help of the Internet and big data technology, MYbank will be able to reduce the operational and promotional costs significantly*". According to the CIO, by mid-2019, MYbank had already had a team of 800, among whom 2/3 were technology talents. MYbank's leadership teams are experienced banking and IT professionals including senior officers from the traditional bank industry. MYbank works as a tech company with a banking license. According to the Bank Manager, taking account maintenance for example, while traditional banks have to spend RMB 30 to 100 for each account annually, and six to seven cents per bank transaction, online banks only need to spend RMB 0.5 in maintaining an account for a year and two cents on each transaction. Processing and approving a loan transaction may cost traditional banks close to RMB 2,000 for document vetting and side auditing. However, it only costs MYbank RMB two cents to process and approval the loan in a few seconds.

The rise of affordable smart phones, easy access to mobile Internet and a variety of e-commerce platforms continued to drive the social connectivity and change consumer behavior towards financial services needs/experience in China. And thanks to the emergence of mobile payment services, users can now virtually manage their finance over the Internet anywhere, anytime and with anyone. Alibaba mobile payment account, for example, had 1.2 billion account holders and processed more than 80% of China's online transactions in 2019. The Alibaba online debit card allows users to set up interest-bearing accounts from which they can deposit or withdraw funds, transfer money and make payments. Alibaba online platforms collectively occupy about one third of the e-commerce market in China. By doing purchase and delivery transactions online, consumers generate a vast trove of data about themselves on these platforms. Besides basic demographic and income data, consumers now leave glistening trails

of who they are, what they look at and listen to, where they live, what they want to share, what they like, what they buy, who their friends are, where they eat, where they travel and many other traces. Leveraging on the big data, the online FinTech experience has become much more personalized for consumers as some advanced IT firms adopted the techniques of "programmable financial services" which means that individual credit rating and personal financial planning can be pre-programmed to match the needs of individual users.

Financial services for SMEs in China have always been insufficient. In the past, these companies had no choice but to turn to private lenders or loan sharks. According to the interviewees, while traditional banks evaluate a loan applicant's credit based on his or her debt records, revenue status and cash flow chart (the so-called "three-sheets evaluation"), which could be inaccurate sometimes, MYbank evaluates an applicant's credit based on big data. Most of MYbank's employees are technology professionals, who spend most of their time using models to deal with the big data. Their goal is to make MYbank "smarter" in dealing with customers' needs. *"Our data come from not only Alibaba and related companies, but also some credit evaluation companies, such as Sesame Credit*", said the Bank Manager. According to the Bank Manager, such evaluation is more comprehensive and credible, since besides the "three sheets", an applicant's family consumption status and his/her employer's supply chain condition are also taken into consideration before issuing a loan. MYbank lowers risks significantly by doing so. For example, MYbank will evaluate a company's credit based on its transaction history, behaviors and living status, instead of its operation scale and asset conditions at present, which could hardly meet the basic requirement for traditional banks to issue a loan. The Deputy Bank Manager added, *"Online banks' financial services are strongly based on consumption behaviors, especially on online retail platforms. MYbank is leveraging on Alibaba since users of Alibaba's online purchase/payment platform are naturally the potential users of MYbank.*" In his opinion, the key of any financial services lies in catering to specific transaction scenarios.

Before the establishment of MYbank, Alibaba had already tested its capacity in providing micro-loan services through its micro-lending service company. By the end of April 2015, a micro-financing company had already lent out over RMB 400 billion to more than 1.6 million small-sized companies and entrepreneurs, while keeping the bad loan rate at lower than 1.5%. Micro-lending has gradually been integrated into MYbank's platform. MYbank's key mission is providing financial services for SMEs. According to the Bank Manager "*If we take the input and output potential of a customer into consideration, we may understand why traditional banks prefer key clients. Although they only take up 20% of all customers, the benefit they bring to banks is significant (over 80%). MYbank, however, targets at the rest 80% only. MYbank*

would only offer loans up to RMB five million (around US$ 800,000) to each customer."

Alibaba's micro-lending platform has been issuing loans for several years, which has helped MYbank gain enough experience in carrying out micro-lending services. "*We are the only one that has been providing instant micro-loan services with the help of big data and the Internet technology for over six years in China*", said the Product Manager. Besides, MYbank has no physical branches in major cities since all its services are carried out online. MYbank can provide financial services anytime and anywhere. "*This is great news for SMEs, since owners of these companies tend to meet customers during the daytime and need financial services late in the evening*", added the Product Manage. Moreover, the company structure of MYbank is lean, so that customers can get their problems solved more quickly. MYbank provides inclusive and innovative financial solutions for individuals in both urban and rural areas and SMEs.

Since Alibaba's micro-lending platform has been issuing micro-loans for several years, why does MYbank have to get another banking license? "*Well, it is pretty simple. MYbank is not going to provide only lending service, but rather a variety of services, such as cash management, investment, online and offline financial services, cash flow management and supply chain financial services*", said the Bank Manager. MYbank will also provide financial services for the large number of villagers in China. "*We hope to bridge the gap between banks and villagers and directly provide financial services for villagers via the Internet*", said the Bank Manager.

In fact, the benefit of such services could be significant. According to the interviewees, in early June, a bunch of high-level managers of MYbank did a field study in some villages and found that financial services were indeed lacking there. For example, farmers might have to walk several miles in order to withdraw or deposit some money in RCCs. However, the number of netizens in rural areas was increasing year by year. Statistics show that at the end of 2013, 84.6% of villages had cell phones, while only 79.6% of urban residents did. "*We see a huge market of online banks in villages*", said the Bank Manager. Moreover, online banks will make it easier and quicker to apply for loans, since all the evaluation and application procedures are finished online. Besides, MYbank is looking forward to playing a role in paying for agricultural machines and tools. These are all possible areas for online banks to take part in.

According to the interviewees, it was reported that Alibaba Group is planning to set up 100,000 village outlets across China, where villagers can surf the Internet and buy things online. Undoubtedly, village outlets will be able to attract a large number of villagers. It follows that

MYbank will be able to play a part in all possible mobile payment scenarios. According to the Bank Manager, "*MYbank will follow up and explore every possible opportunity to make a difference.*" Thanks to the low cost of smart mobile set and declining telecommunication cost in China, Chinese villagers embraced mobile Internet more than ever before in the last few years. During the last Spring Festival, more than half of Alibaba's key users were villagers. The Bank Manager added, "*with an increasing number of college graduates going back to their hometowns, we have every confidence that MYbank will play a greater role in the near future."*

The Product Manager summarized MYbank's comparative advantages into four aspects. While villagers and owners of SMEs need to borrow and pay back money instantly, MYbank caters to their needs and provides instant-lending and borrowing services. It also gets to manage risks well with the help of big data and lowers the risk of bad debts significantly. All MYbank's services are conducted online, so that the operation cost of MYbank is low compared to traditional banks. Finally, MYbank lowers the financing cost significantly by providing a platform for private investors and borrowers, so that private lending becomes more standardized, making private financing easier and quicker.

8.3 Business and Innovation Performance

Perhaps one of the most fascinating innovation performances of MYbank is its credit-scoring service known as "Sesame Credit", which combines "big data" technology and customer behavior analytics to help make credit more accessible to millions of Chinese consumers. Sesame Credit is a first-of-its-kind scoring system in China. Online and offline data are used to build credit scores for consumers and small business owners, which lenders, merchants and other companies can use to determine customers' creditworthiness.

The Chief Data Scientist of Sesame Credit said, "*Sesame Credit is focused on those who may have little credit history at traditional credit agencies. They may have never obtained bank loans or applied for credit cards. However, they might be active Internet users who shop online a lot, e-pay their utility bills on time, have a stable residential status and have been using their mobile phone numbers for a long time. We will take these and other factors into consideration when assessing consumers' creditworthiness. By leveraging the big data we have and the state-of-the-art technology we deploy, we believe the debut of Sesame Credit will not only enable credit providers to make holistic and accurate decisions, but also empower merchants to provide more credit-related services. This will make their everyday life easier and help foster a*

healthy socio-economic environment."

According to the interviewees, because payment histories are available from Alibaba for the 300 million real-name registered users and 37 million small businesses that buy and sell on Alibaba's online purchase platform, MYbank has a vast online ecosystem to tap into and mine the data for the information it needs to build better credit scores. The Sesame credit service also allows travelers with superior Sesame credit ratings to book and stay without paying in advance. A Chinese online dating site that allows suitors to check their potential dates' credit ratings to make sure they are not meeting someone who is dishonest or untrustworthy is also making use of the benefit of the service. However, to protect user privacy, individual consent must be granted before data are collected. Moreover, what information is gathered is protected by encryption. The Scores with Sesame Credit will range from 350 to 950 points, and users will be able to access their scores through the mobile app or through merchant websites. The individual credit is assessed based on over 20,000 variables in five dimensions, namely, personal information, the ability to pay off debts, credit history, social networks and behavioral habits.

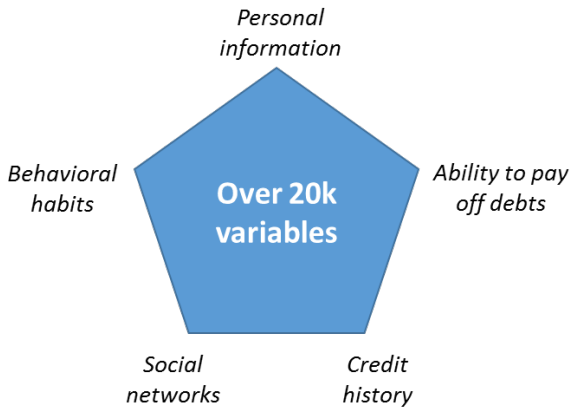

Figure 8-3: Alibaba's self-developed Sesame Credit System

MYbank is a step towards building a full-fledged FinTech platform, which the Bank Manager said will open more services like banking, loans and credit, insurance, payment systems and investment to new tiers of Chinese society.

8.4 MYbank: Aspects Related to Research Questions

Data in this section were primarily based on interviews with officers from MYbank. To make the interview discussions more specific and concrete, the interviewees were asked to share

specific examples from their business functions and describe the innovation and compliance process in detail. The interviewees were senior officials from MYbank, including Bank Manager, Deputy Bank Manager, Senior Product Manager, and Legal and Compliance Manager. While the interviews were conducted with many officials, the view and explanation provided by the Senior Product Manager are robust and important.

The Senior Product Manager had 12 years of experience in product design and development, of which five years were related to financial product innovation and development. According to him, the role of product manager spans the whole development process and cycle, from idea generation, to resources coordination, product promotion, testing, deployment and continuous improvements/upgrading. He needs to communication and coordinate with over 20 departments (technical, IT, testing, finance, legal and PR) and cross-organizations. To do the job well, the Product Manager needs to possess five key skills, namely, specialization/expertise, communication and coordination, learning and innovation, empathy (ability to see things from different perspectives) and a fine personality. All these five key elements are equally important to ensure successful product innovation.

8.4.1 Financial Innovation Process

Before analyzing the innovation process of FinTech, an important question needs to be asked: What are the differences in innovation approach and process to develop a Mobile Application compared to a FinTech product?

Table 8- 3 Development comparison between a mobile application and a FinTech product

Comparison Domain	Mobile Application Products	FinTech Products
Development objectives and key success indicator	Focus on satisfactory user experience and interactive user interface to attract usage. Key success is to find an infliction point for critical mass user volume and online traffic.	Require conservative and comprehensive considerations in the product pricing, transaction flows, regulation, technology platform, risk and financial impacts. Key success is balance of risk and return.
Development process	Focus on single or several key innovative points or product features to achieve market proposition leadership.	Ensure comprehensive review in the product design, regulatory compliance, risks monitoring and industrial practice/knowledge to minimize risk and optimize return.
Product defect tolerance	A high level of tolerance to product defects. Patches can be developed to fix product defects during the product lifetime.	Zero tolerance to product security risk. Product defects can lead to severe financial losses.
Knowledge base	General knowledge about user requirements, industry/service gaps and market opportunities.	Specific knowledge about the financial industry operations, market, credit and operation risks, industry characteristics, financial product and subject matter expertise.
Operation method	Regular monitoring on system performance, user authentication, content and service management, user behavior and preference, and portal traffic.	Close monitoring of the rating system, approval process, pricing model, transaction system, risk monitoring and alert, loan approval decision-making process, financial analytics, and interest rates adjustments.
Good product characteristics / features	Easy to use, good user stickiness and usage volume	Easy to use, real user benefit (loan product – lower interest, longer payment term and easier & quicker approval process) compared to traditional banking products. Good and interactive user interface.

Source: The author's analysis

Alibaba was fully aware of the above differences and therefore decided to spin off its

FinTech development unit soon after the establishment of MYbank. MYbank was managed by a separate product development team, which was fully responsible for its financial performance.

According to the interviewees, traditional banking relies on an extensive branch coverage, transactional banking, cash management, international funds transfer and merchant banking services as its core services/products offering. FinTech, on the other hand, has no physical branch outlets, offers innovative, easy-to-use and quick banking application solutions to its user over line Internet or mobile Internet. The traditional banking's core customers are large corporations, multinationals and high-net-worth individuals. FinTech's core customers are SMEs and low-net-worth individuals. When asked how MYbank differentiated itself from traditional banking, the Product Manager answered, *"MYbank offers quick financing facilities to SMEs and users in our channels/supply chain networks (online purchase platform in Alibaba). We bundle our financial products to different application scenarios on our existing platforms. For example, we offer credit facilities/installment payment application to online consumers based on their credit rating. We also provide supply chain financing services to our online suppliers/traders based on their past transaction records. All these types of financing are unsecured and yet we have a low default rate. The beauty of FinTech is financial freedom anywhere and anytime based on self-service and self-discipline.* "

According to the interviewees, Product Manager plays a very important role in the product innovation process especially in the Internet firms (and also in financial institutions). In MYbank, the Product Manager is the key driver and the core/center of financial innovation or NPD process. The Product Manager needs to continuously learn and understand new technologies, new products, new market/customer insights, new applications, new industrial trends and developments in the market. The key source of new product idea generation is mainly from the Product Manager. The Product Manager needs to have a strong knowledge base in his area of expertise, be aware of new technology/application in his area of expertise and continuously generate new ideas (exploratory invention) and enhance the existing product user interface and experience in a series of version updates (exploitation inventions).

Once the new product ideas are generated, the Product Manager needs to describe the product design and features in a logical way that can be understood by others using a conceptual model. The Product Manager needs to develop the initial product requirements specification and expected final deliverables, namely, "the look and feel" documentation to illustrate the new idea in a simple and understandable way for anyone who does not have background knowledge of the new product design. Then, the Product Manager will present the new product proposal documents at NPC for assessment and approval. The NPC is chaired by the bank manager and

consists of heads/representatives from technical, risk, finance, marketing, operation, IT, testing and compliance. At the new product review meeting, the NPC members will question the product concept/objective, market/business values, industry trend, expected return (such as increase in deposit, loan or user base), investment requested (number of man-days required in product development), financial/operation risks, implementation feasibility and strategic fitness.

The NPC will provide feedback to help the product team improve the product design (precise product proposition and to avoid potential product conflicts), development timeframe (when to develop and to launch) and implementation considerations (such as the product's user flow and wireframe, hosting system and market proposition). The product team will change and adjust the product design and functionality before presenting it to the Risk Appraisal Committee (RAC) for review and approval.

The RAC is chaired by Legal and consists of heads/representatives from risk, compliance, finance, loan monitoring and internal audit. At the risk review meeting, the product pricing (annual interest rate), user/customer segment, targeted number of customers, financial model, systematic risk, risk modeling, bad debts, expected income and preventive, detective and corrective measures for risks credit/operation risks, related regulatory compliance issues/requirements and process controls mechanism will be discussed. The product team will again adjust the product design and functionality to meet the financial expectations, regulatory compliance and risk control requirements. The conceptual design validation process sometimes takes several rounds of discussions and product adjustments based on technical advices (user experience and interface design) and development timeframe requirements (to add, adjust or remove certain functionalities).

Once the initial design is approved by the NPC and RAC, the Product Manager needs to assess the knowledge/technology base needed to develop the product and coordinate the required (internal or external) resources. During the development process, there are many small and in-progress deliverables (beta versions) developed for user test and customer experience feedback. The product team continuous to adjust the product interface and functional design to enhance user experience.

What is the coordination/interaction with Legal and Finance teams? According to the Product Manager, *"We have good partnership with both legal and finance teams. We often check with legal on the product compliance issues and legal implications. Legal usually provides god feedback to the product team on the legal/regulatory conformity. Whenever in doubt, the legal team will informally check with the regulator to obtain directive advice. Since FinTech/banking*

is new in China, we still have a lot of areas to explore and exploit. Therefore, legal conformity is important for product market launch and financial system stability. We also frequently check with Finance team on the financial and user targets. Every year the bank will allocate certain amount of marketing budget for product promotion. So, we will carefully check with Finance on the marketing budget for each product promotion plan. Sometimes, if it is a mandatory bank action, like villagers financing, we might still launch the product even at the risk of losing money."

When the product is ready to launch, the product team will coordinate the product launch plan and media announcement with the marketing team for pre-launch warming up. At the same time, the product team will work with the technical support and operation team for potential user issues and technical resolution recommendations. The product team will provide training to the customer service team for anticipated user/customer questions. For big projects, such as mobile wallet, the VP/branch manager will launch the new product at media conference and provide some high-level visionary promotion for the new product and its market proposition in social media, entertainment, personal or corporate finance. In short, the Product Manager is responsible for designing, developing, promoting and sponsoring the new products.

Once the new ideas are accepted, the Product Manager will be responsible for the whole end-to-end development process, including investment justification and innovation output/outcome success or failure. Before the formal launch, the team needs to develop a response protocol to potential questions/issues from users. Procedures/backup plans must be in place for resolving user/technical issues. After launch, the product team will review the product performance in the market on a weekly basis, collect user feedback and continue to adjust/improve the product design.

The product team will also work with the marketing/operation team to design and implement some product promotion events/offers. During the entire product lifecycle, the product team collects many data such as user volume, daily access, revenue, profit, bad debts, product performance and conflict for deep dive analysis. The product team receives a lot of analytical reports in relation to the product performance in the market for product performance enhancement. The product team studies all these reports/data to preempt issues and identify new trends/innovation ideas.

How does the product team coordinate with marketing and operation teams in the product deployment? According to the Product Manager, "*When we have the product idea, we will check with the marketing team on the potential user volume of the new product. We also talk to the*

operation team to review the new product design and feasibility by analyzing the big data we have. For example, the operation team will tell us when users need financing (usually before mega online shopping festivals for supplier/producer/SMEs, and during or after festivals for online shoppers. The operation team will also inform us of the target product user groups and their financing needs/behaviors, and we might adjust our product features (such as discount on interest rate/instalment plan/principal payment scheme) to promote usage."

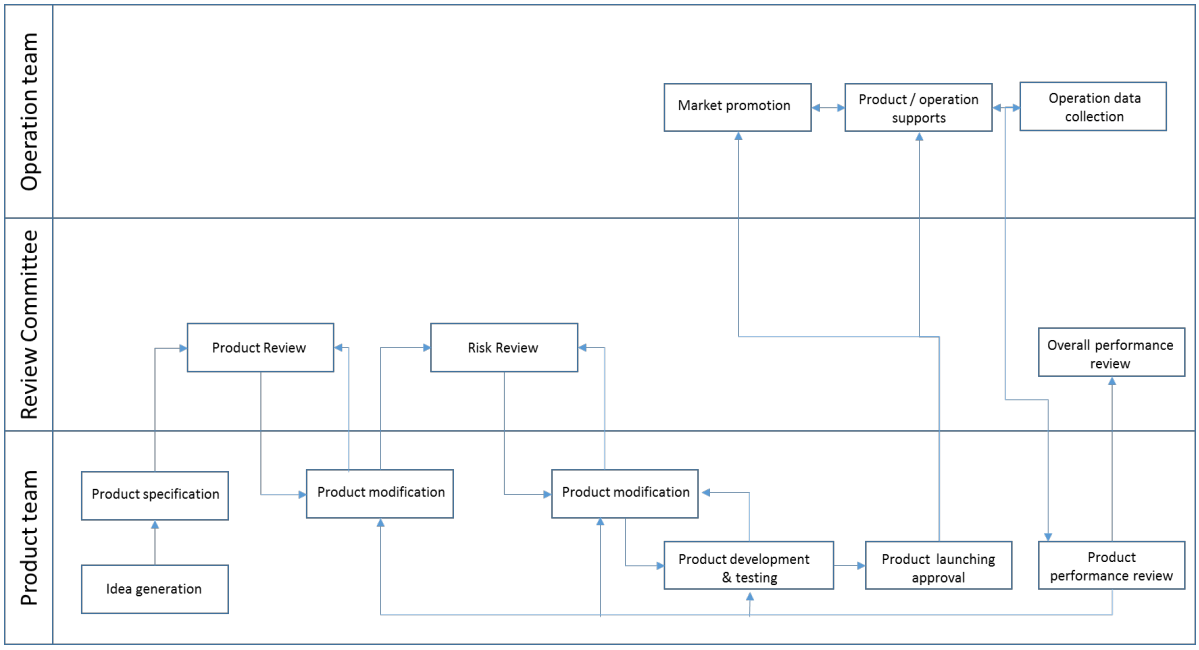

Figure 8-4: MYbank's innovation process

Source: The author's analysis

Further analysis

The financial innovation process at MYbank shows a few interesting features. At the product team level, it is a "circular" or "recursive" invention process which stresses the versatile feedback mechanisms and interactive relationships among multiple functional expertise, product users, development activities, and supporting infrastructures.

It is a model of continuous product enhancement, in which the actors from different backgrounds learn from each other in an interactive innovation process. Many actors are involved in the innovation process, and the innovation process/idea can be triggered by many causes.

Both explicit inter-organizational innovation networks and social linkages (within Alibaba group of companies) and implicit intra-organizational check-and-balance and compromising

mechanisms are critical in this innovation process.

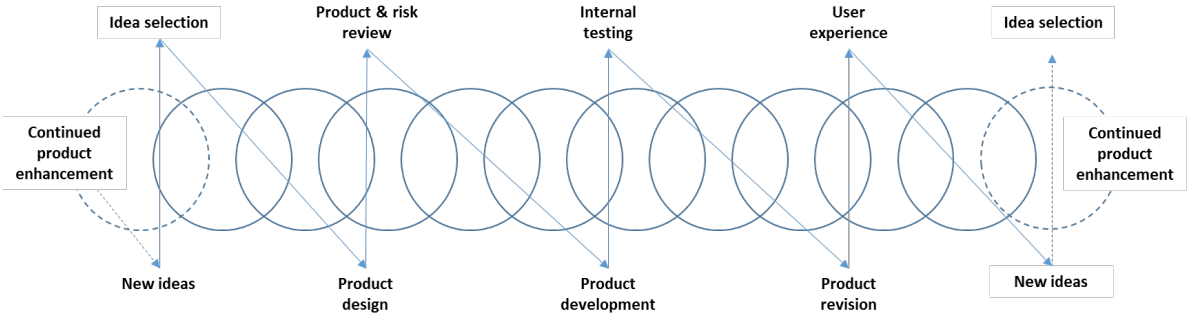

Figure 8-5: MYbank's agile development method

Source: The author's analysis

The agile development methods break the tasks into small increments with minimal planning and do not directly involve long-term planning. Iterations have short time frames (timeboxes) that typically last from one to four weeks. Each iteration involves a cross-functional team working in all functions: planning, analysis of requirements, design, coding, unit testing, and acceptance testing. At the end of the iteration, a work product is demonstrated to stakeholders. This minimizes overall risks and allows the project to adapt to changes quickly. An iteration might not add enough functionality to warrant a market release, but the goal is to have an available release (with minimal bugs) at the end of each iteration. Multiple iterations might be required to release a product or new features.

What kind of innovation development model is adopted in MYbank, innovation development from centralized investment or daily operation? According to the Product Manager, MYbank applies both continuous and breakthrough innovation development models. **Continuous innovation** includes process optimization to reduce development time and resources, effective project coordination and management to reduce communication time and costs, as well as gradual upgrading and enhancement of the existing product design, features and functionalities to increase product usage and lifetime. These types of innovation cover every aspect of the innovation development from idea generation to product deployment and maintenance. The innovations happen in daily operations, whereby good practices/new ideas are discovered, leveraged, copied, promoted and further developed to improve overall innovation fundamental of the organization. Innovations are gradually built on the **"continuous innovations**" or **"process innovations"** and leveraged across the entire organization and innovation process.

Another type of innovation model is "**breakthrough innovation**" which refers to new start-up or new product innovation development sponsored by centralized investment from the

firm. For example, the "horse racing club" is an innovation facilitator scheme designed to promote "**breakthrough innovation"** or **"new start-up innovation**". Every year, Alibaba will organize "horse racing" where individuals or small groups are encouraged to submit their innovation ideas to a committee. Once the innovation idea is accepted, the firm will provide all the necessary resources and funding to sponsor the fertilization of ideas to actual products. The "horse racing" is divided into five stages of "idea submission", "idea selection", "idea fertilization", "idea assessment" to "idea implementation". The firm will provide the required sponsorship in each stage including coaching, financial, legal, testing environment, training, incentives and development resources. The objectives of "horse racing" is to identify not only new ideas, but also talents and new start-up opportunities. However, there are inherent issues with the "horse racing".

Does MYbank learn from and leverage on some mature financial products overseas in its NPD process? According to the Product Manager, MYbank remains open to learn and leverage on any good financial products in the domestic and overseas markets. In general, overseas market products are modified to adapt to the domestic market needs, considering the local user requirements and regulatory environment specification. More importantly, the Chinese market has a large user base, which continues to provide feedback on product performance and enhancement needs. So, the third innovation model is **"evolving innovation"** or **"incremental innovation"** where an initial concept/a green product is borrowed and enhanced to provide new application usages by integrating into a new business platform or environment.

The product evolves from "borrowed sample(s) for limited/unmatched application scenarios" to "evolved new product for rich/matched application scenarios". The evolution is completed through several rounds of application upgrading applying the **SRPINT** methodology. The evolved new product can be significantly different form the initial "borrowed" concept/product. For example, Alibaba was evolved from Ebay and WeChat/QQ was evolved from ICQ. MYbank adopts a rapid development methodology. For short/simple projects, the development cycle is two-to-three weeks, for larger or complicated project, the development cycle is one-to-two months. To achieve this, the product team needs to be fully dedicated to the product development. Each team member usually works 12 to 14 hours a day. It is not "just-to-work", it is the passion, interest and satisfaction in product development and successful launch that drive the development progress. Any members/products can be replaced in the Internet environment, and therefore the team needs to have a strong sense of crisis.

The **"evolving innovation"** is different from the Japanese innovation systems in the late 20th Century. In Japan, the tradition of scanning the globe for the best available technology, then

importing, adapting and improving the foreign technology, was born out of the necessities of its crash industrialization program. A relative weak system of intellectual property protections was natural, given its position mainly as an importer of foreign technologies. The Japanese government took an active role in subsidizing and supporting the industrial infrastructure it strove to develop in the national interest. A strong and highly-capable elite bureaucracy was created to coordinate and support the efforts of the private sector in reaching this target. Japan's drive for industrialization and the adoption of Western technology led to the establishment of its national university system and the development of its car manufacturing industry (National Research Council, 2009)

Table 8-4: A comparison between Chinese and Japanese borrowed innovations

Comparative parameters	**Chinese innovations based on external [borrowed] technologies**	**Japanese innovations based on external [borrowed] technologies**
Concept	Make significant localization adaptations of the foreign products and/or increase their usability in the local market substantially.	Make significant technical adaptations of the imitated products and/or reduce their production costs substantially.
Focus	Focus on the business model innovation to improve both product design and features, namely, easy-to-use.	Focus on process technology innovation to improve both productivity and quality, namely, smaller and cheaper.
Dominance	Dominance in marketing aimed at achieving critical mass usage in the short term (rather than green field innovation).	Dominance in development aimed at commercialization (rather than the early stages of research).
Tendencies	Chinese brown-filed innovation tendencies	Japan's copycat tendencies

Source: The author's analysis

The SPRINT project, which is short for **Software Platform for Integration of Engineering and Things**, aims to overcome the challenges presented by today's siloed approach, where the actual integration and testing of the various components is only possible once the system can be completely assembled. A sprint is a get-together of people involved in a project to further a focused development of the project. Sprints typically last from one week up to three weeks. Sprints have become popular events in some open-source projects. Sprints

are organized around the ideas of the Extreme Programming discipline of software development. A coach directs the sprint, suggesting tasks, tracking their progress and making sure that no one remains stuck. Most of the development happens in pairs. A large open space is often chosen as a venue for efficient communication. Sprints can vary in focus. During some sprints, people new to the project are welcomed and get an intensive hands-on introduction pairing with an experienced project member. The first part of such sprints is usually spent getting ready, presenting the tutorials, getting the network setup and ensuring that configuration/source-control software and processes are installed and followed. A significant benefit of sprinting is that the project members meet in person, socialize, and start to communicate more effectively than when working together remotely (Düring, 2006).

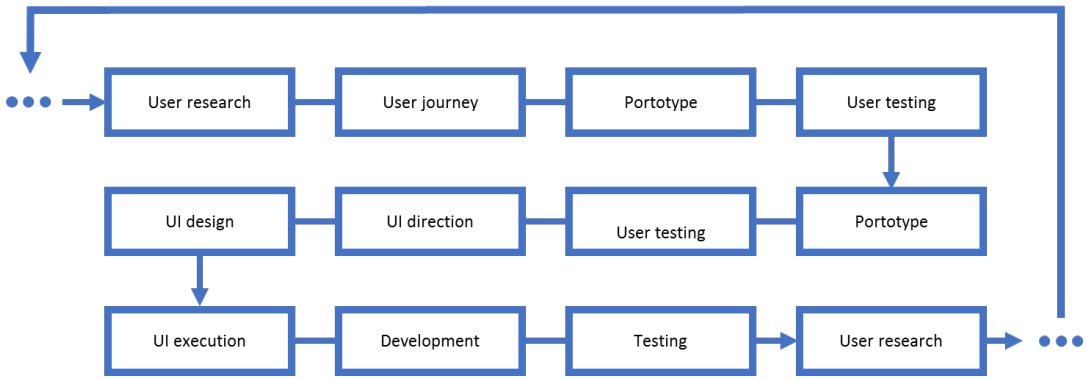

Figure 8-6: The "SPRINT" Innovation model

Source: The author's analysis

The Product Manager of MYbank said, "*We continued to learn the new products offered by our competitors in the market. We study these products to see if there is any strategy fit to our product portfolio. We may adjust the competitor product or modify our own product based on the new idea from the competitor product. The characteristics of good Internet products are "speed-to-market", "copy and modify" and "gradual innovation". With small innovations over time, we can adjust the product design and features based on the changing market and the financial consumer needs. We do not want to develop a subvert product to risk the firm, affect the regulatory/industry stability or challenge the existing laws. We are, after all, a young company set up in mid-2015. We need some time to learn the rules of the game. We are not ready, unlike Alibaba, to make any disruptive innovations in this space."*

What types of actions are possible (benefits) with the present innovation model and position? First, MYbank has at least three types of innovation models for different

innovation/development needs. Based on the contingency theory, there is “no one best way” or approach in management or doing things. Different situation calls for different approaches to handle, manage, and solve the arising issues concerned. Management and organization is an “open system”, which embraces anomalies or challenges every now and then, which requires “adaptable” and “situational” solutions in order to overcome or solve the problems or issues concerned. In such cases, MYbank adopts “continuous innovation” for process and service improvement; “breakthrough innovation” for new product or startup innovation; and “incremental innovation” for product features and enhancement of functionalities. Second, it constantly adjusts the speed and scale of innovation based on market conditions and the regulatory environment. For example, when the market has a huge demand for wealth management, it offers online monetary funds and online investment portals on its platform. When the regulatory environment is risk-cautious on P2P lending, MYbank would not enter this market segment although the profit is lucrative. Third, diversified innovation models also allow MYbank to engage in multiple innovation activities in different scales and speed to diversify risks of innovation failure. The innovation maturity period is scattered across different timelines which allow MYbank to optimize the returns from innovation investment. Innovations are cultivated and nurtured in different waves of maturity to enable continuous new excitement to the market for new product launch.

Based on this generic innovation model, what are the actions about innovations or contacts with the regulator? First, MYbank adopts an agile and mild innovation approach to take time to learn the Chinese banking system and financial regulatory requirements/operation environment. It also avoids being seen as “overly aggressive” in the eyes of regulators and traditional bankers. This will give room and time for MYbank to develop and make some minor mistakes. However, being “mild” does not mean being “slow”. MYbank continues to launch innovative financial products through Alibaba online platforms and continues to seek collaboration opportunities with traditional banks. Second, regulators are cautious on the overheated FinTech development with some recent cases of several large FinTech firms and platforms going into bankruptcy. Regulators also carry a political agenda of promoting innovation to spur economic development from investment-driven to consumption-driven. Therefore, regulators, to a certain extent, are counting on large and established IT firm such as Alibaba for responsible financial innovation. According to the interviewees, regulators are open to dialogues and innovative products from MYbank, especially to products to help resolve the financing difficulties of SMEs and villagers. Adopting a mild innovation approach will help reduce regulators’ control of systematic financial risks from the widespread unproven financial

products.

What are difficult or impossible with the present innovation model and position? The current “diversified innovation processes” are only suitable for SMEs or startups. When the organization gets bigger and more complicated, resources competition for innovation activities may occur across different themes. For example, employees participate in the “horse racing” program need to carry out the breakthrough innovation in their own time and in their own formulated team. The “horse racing” is considered a personal activity that is not incorporated in the line or department KPIs. Because of this, the “horse racing” program has become less popular nowadays when the workload becomes heavier. In addition, some good developers are highly demanding and may involve in multiple innovation development teams. This may easily result in talent burnouts. On the other hand, poor performers continue to be neglected. Not all employees are motivated, experienced and skilled enough to self-organize into an efficient team. The agile squeeze out the mediocre and high performance is required. Hierarchical bureaucracy breeds incompetence and feeds off mediocrity: The organization performs accordingly. Faced with the choice between the high performers and the mediocre, most traditional management opts for mediocrity.

Finally, what types of actions look promising to enlarge or to modify/strengthen the innovation process? To mitigate the limitations in agile innovation approach and diversified innovation processes, MYbank shall consider slowly moving to a “work cell” innovation model whereby the innovation team is specialized by product or industry. This will help ensure balance of talents and resources in each work cell. All the different types of innovation activities can then be integrated and centralized around the specific work cell. It is “agile and diversified” within the work cell, but a “standard and coherent” innovation process outside the work cell for overall consistency.

8.4.2 Regulatory Dialectics Reconciliation

China’s regulatory environment is promoting financial innovation. Premier Li Keqiang strongly promotes financial innovation to support the economic growth and consumer needs. New and innovative financial products are needed to support the interest rate liberalization and Renminbi internationalization initiatives. The regulatory environment is changing from anti to pro financial innovation. Many new regulations, opinions and directives are developed to guide and promote financial innovations. The regulators are more tolerant to mistakes and FinTech

firms have room for continued improvement. However, all FinTech firms have been reminded not to cross the two red lines, namely, illegal fund-raising and illegal absorption of public deposits. For example, P2P platforms shall not set up cash pool, engage in guarantee, lending and borrowing activities on one single platform. The FinTech has the characteristics of small amount, efficiency, convenience and inclusiveness. It can help resolve any issues the traditional banks are inefficient to handle. The blending of traditional banking and FinTech can create a more productive and efficient financial system.

What are the most important regulatory changes that have affected the innovation/changes at MYbank? According to the interviewees, first, the regulation has formalized the qualification, compliance and operation requirements of third-party mobile payment platforms. This helps Alibaba develop the platform and grow (user-base), accumulate experience and develop big data for MYbank. Second, the issuance of private banking licenses provide the opportunity for Alibaba to set up MYbank. It is strategically rational for Alibaba to venture into FinTech operations, to have a separate organization and brand to be fully dedicated to developing financial innovation products that meet the needs of its online platform users (suppliers and buyers). It is also logical and important to diversify risks. The FinTech operations are highly regulated and have a different operational model (compared to online purchase platforms). The setup of a private bank (MYbank) allows the new organization to venture into more financial and banking activities, which Alibaba has limitations in. The new organization has the blended DNAs of both the Internet and Finance.

How is MYbank aware of new regulations announcements? The Legal and Compliance Manager commented that, first, the legal and compliance team has regular communication channels with the regulator. The legal team may be asked to join some round table discussions or required to provide commentary on new regulations before formal release for adoption. This provides a forum for MYbank to understand the regulation focus and development. As financial innovation takes time, early awareness of regulation change and development allows MYbank to preempt regulatory requirements and concerns in the financial innovation product design and development process. Second, MYbank, like other banks, has access to new regulations announcement, such as PCOB's website and internal notifications. Product Manager needs to be aware of and sensitive to the regulatory development in his/her product portfolio. An example of other informal information channels is WeChat.

Are there lower requirements on capital reserve and disclosure? According to the Legal and Compliance Manager, the answer is NO. After MYbank obtained the private banking license, as other traditional banks, it is subject to the capital reserve, deposit insurance, regulatory

inspection, compliance, and disclosure requirements. According to the Legal and Compliance Manager, *"In fact, we are less flexible than before (compared to the old days in Alibaba) and our compliance costs have increased substantially. We are facing more restrictions and additional terms and conditions in deposit/liability operations. Our business expansion is also limited by capital. However, we view these as necessary and a short-term transition. Once we have developed the procedures and reached the critical mass in FinTech operations, we can actually offer a greater variety of financial innovation products/services to the market."* The Product Manager added, "*We conduct regular dialogues with the regulator to understand the regulatory concerns and new developments. For NPD, we explain the design, logic and objectives of the new products to the regulator. We make justifications on how the new product can help achieve the government's objectives and comply with the laws and regulators' requirements. Before we bring the product on the table with the regulator, we, of course, internally have validated the product value and mitigated any potential negative impacts to the industry and society. So far, the regulators are very open and supportive to new financial innovation and development."*

When asked about how MYbank performs its risk management in the "virtual environment" of Internet Banking (no physical branch outlets, no personal meeting or document validation before lending out), the Product Management said *"Unlike traditional banking, in most cases, we do not require collateral or written documents in the lending process. Instead, we rely on big data analytics. We have a risk management team to analyze the borrowers' transaction flows and their industry development. Based on real transaction data and some modelling, the risk team can predict the trend of the industry and the inherent/systematic risks of the market. Our real-time big data analytics capability helps us avoid lending to industries with high risks, monitor market and credit risks in a real-time manner, alert risks of potential default early and eventually lower the rate of bad debts. The big data also help us design appropriate products that meet the market needs for selective industries. Risk scoring measurements are included in the product design in the early stage of development. Besides, the risk alert function helps us adjust the repayment tenure and collection strategies with the borrowers.*" In short, FinTech firms apply pre, during and post risk management in the lending process based on real-time transactional data of the borrowers and their industries. This is what traditional banking lacks, and therefore they have to rely on collateral as repayment security. The lengthy approval and overwhelming paper vetting process also makes it "difficult-to-use" for SMEs".

How does MYbank reconcile the dialectics between regulatory compliance and financial innovation development? According to the Product Manager, *"We have a stringent self-review*

mechanism (such as NPC and Risk Appraisal Committee) to evaluate the implications of new financial innovations to the industry and market. We have a large customer/user-base (in MYbank and Alibaba), and therefore our actions may have big impacts on the financial stability due to multiplier effects. We are mindful of our innovation implications for financial stability and market equilibrium. We implement mild innovation instead of disruptive innovation. We prefer gradual innovation over radical innovation. We embrace regulators and their concerns in our innovation process. We proactively communicate and coordinate with regulators in our product development process. We take quick corrective actions when required and when instructed by the regulators. We support the vision of developing a "responsible financial innovation environment" and we take full responsibility to protect the interests of financial consumers."

Previously, Alibaba's monetary fund was criticized as "distrust to financial stability" and a form of "shadow banking" by traditional banks. As to how MYbank differentiates its products from Alibaba's monetary fund, the Product Manager said, *"Firstly, Alibaba's monetary fund has its history and was required at that time to solve the inter-back liquidity issue. The monetary fund's interest rate has been reducing and is close to the market rate now. Besides, there are more wealth management options in the market now offered by traditional banks and FinTech firms."* Overall, Alibaba's monetary fund has a lower profile now and may one day be integrated into MYbank platform. The Product Manager added, *"MYbank also engages in WMP innovation, but currently the key focus is providing financing facilities to SMEs. We may engage in corporate finance and banking services in the future.*"

Finally, to sum-up MYbank's approach to reconciling the dialectic between financial innovation and regulatory compliance, the Branch Manager said, "*First, as an individual, one must continue learning new technologies and deepen his/her fundamental knowledge in banking operations. The financial system market is new (to MYbank) and changing fast with market liberalization. Second, as an organization, we must keep healthy and close communication with the regulators. We promote "mild innovation" so that the market has time/space to digest and accept the new practice/routine. Third, as a player in the market, we must appreciate big data and platforms which provide us with the hints of future direction/trend. Fourth, as an industry, the financial system has been here for over one hundred years. It changes slowly and may not meet the contemporary needs of certain user groups. We need to carefully understand why the traditional banking/financial system did not respond to certain requirements, what the fundamental issues are and why this/that way is not feasible. If we plan to change to a new method/approach in addressing the user needs, who should do that without*

challenging the rules/regulations. Do we have a better understanding of the consumer needs/risk profiles which put us in comparative advantage proposition? – This is key to success"

8.4.3 Financial Innovation Management

What kind of organizational, product and service changes did Alibaba in general and MYbank in specific experience in recent years? According to the interviewees, in terms of **organizational change,** Alibaba was initially an online shopping platform which slowly expanded its business scope to FinTech. Alibaba adopted a phased and agile organizational change approach in the organizational change process. Firstly, it used a big project method to pull together over hundreds of experts/talents from various departments into the FinTech product development team. Secondly, it approached and attracted industry experts from the traditional financial service sectors, such as senior officers from regulators, experienced bankers from the Big Four, private and foreign banks, chief analysts from merchant banks, and professors from private universities to assume leadership roles in the new organization (MYbank).

The blending of the Internet and banking DNAs created a new operational model at MYbank, which not only digitalized the traditional banking functionalities, but also explored new business applications for financial inclusion in rural areas. Thirdly, it changed from the "platform" operating model in Alibaba to the "skill" model in MYbank. The skill model allows for more focus on specific industries, operations, customers and product segments to develop subject matter expertise. This includes skill-based product innovation teams and back-end support teams. Fourthly, it encourages people/job rotation across business functions and organizations. The lean people structure and flexible HR policy allows optimum match of individual expertise/interest with the organizational/personal growth needs. Fifthly, when the regulatory environment changed and government started to encourage financial innovation to foster change in traditional banking operations, Alibaba established a separate organization, namely, MYbank, equipped with the private banking license to house the new Internet Banking operations. The segregation successfully created additional market value to the existing and new businesses with a focused business scope, an operational team and a market proposition.

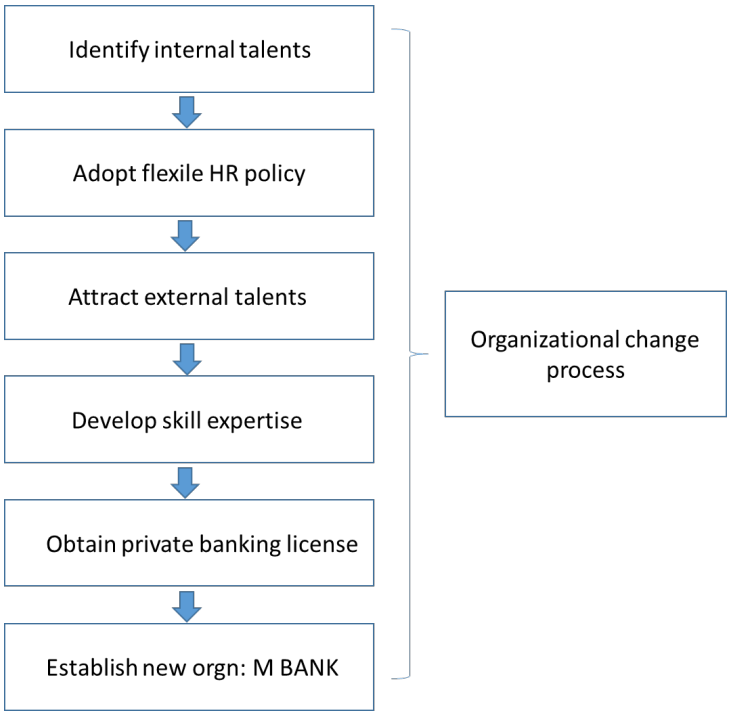

Figure 8-7: Alibaba's/ MYbank's organizational change process

MYbank provides **a pro-innovative environment and supporting mechanism at organizational level to foster innovation.** Alibaba and MYbank are deemed as "disrupters", "spoilers" or "subverters" to the Internet and Finance industries. The business cultures advocate that "one cannot rest on old success" and "bottom-up grassroots open innovation" to enable the business to maintain strong and sustainable vitality. MYbank also **has many incentives to promote individual and group innovation.** These include the "horse racing club" and "inventor copyright" programs which recognize and protect individual invention contribution. Under the "horse racing club" program, any staff can submit their ideas to the "innovation board". Once the ideas are recognized, the firm will provide equipment, resources, funding and stock options to develop the idea into a product. The "inventor copyright" program allows the staff and business partners to register "intellectual property protection" as copyright owner in the cooperation program. The inventor can apply for methodology, naming, outlook and design copyrights of their new inventions in the program. The usage right is assigned to Alibaba/MYbank but the copyright ownership remains with the inventor. The cooperation program provides product authentication, intellectual property protection, online counterfeit analysis, and intellectual property protection education and training. For internal invention, additional recognition (like career promotion) and monetary reward will be given to the creator.

In terms of **product/service change**, Alibaba initially only offered online purchase and payment services, which included third-party transaction guarantee and account management

services. When traditional banks faced liquidity issues, it teamed up with an investment fund to develop a "monetary fund" to attract and consolidate mass market liquidity with high market interest rates (but below interbank rate). Then, it channeled the consolidated funds to the interbank market through the investment funds for a risk-free but profitable-return. This monetary fund made Alibaba popular and labelled as a destructive innovator to the traditional banking business. The initial success and lucrative income from FinTech caused Alibaba to set up a team to further explore the potential in this business area. MYbank started to apply big data analytics to its online suppliers' and buyers' transactions.

Based on the transaction flows, Alibaba created some forms of credit rating system through which MYbank can apply for its micro-financing business and WMP promotion and market targeting. For example, MYbank built a micro-financing credit scoring system which allows the backend system to analyze the transaction flows of an online supplier to determine the risk rating and the amount of unsecured loans that can be granted in real-time. The instant cash and unsecured loans help fill the gaps in SMEs financing which the traditional banks are less efficient/productive to offer. In short, the product/service evolution follows two routes, (1) Market Pull – from simple online third-party payment and monetary fund platform to comprehensive Internet banking operations including deposit, wealth management and micro-financing. (2) Technology Push – from personal computer to smart phone; from client-server system to cloud computing; and from transactional support to big data analytics. In the future, MYbank may engage in more advanced private and corporate banking operations.

How does MYbank manage an innovation project? According to the Product Manager, *"Basically, we follow a product development master plan, which incorporates the product objective, design, function, application scenario, development schedule, testing plan, marketing and promotion plans. The Product Manager will coordinate the resources and manage the timeline to complete the project in time. When the product is delivered and launched. The project is closed, and team members are dissolved. The Product Manager, together with the team members, can be multitasking and managing several projects at the same time. The product manager, who is also the project manager, is responsible for the delivery of products. In addition to one-off product development mentioned earlier, we also have continuous product development projects. In this type of "continuous development projects", the team members will continue to observe the market feedback/performance after initial launch and work on the subsequent enhancements. New versions of the product with upgraded functionality/user experience or bugs fixed will be scheduled to launch in the market in specific time intervals."*

How does a Product Manager select project team members? The Product Manager replied,

"The selection of project team members is based on their expertise and availability. We need team members from diversified backgrounds and specialization in different areas, including product designer, artist/interface designer, architecture developer, functional programmer, tester, data analytics, market analytics and banking experts. Basically, we have two types of people in the project team, innovators and technicians. The innovators keep an open mind to the product design and features, continue to learn from the market and users, and respond to the questions/demands from the product team. The technicians, on the other hand, focus on their own areas of expertise, respond to the innovators' questions/demands with innovative business and product solutions. We exercise job/role rotation to both innovators and technicians, so that everyone has a chance to develop themselves in their own interest."

According to the interviewees, MYbank adopts a project management approach in its product development. It consists of key activities such as project master planning, resource planning, product design, product development, product approval and launch, product performance analysis, and product adjustment.



Figure 8-8: MYbank's project management approach in product development

When the product deviates from the initial plan, what actions will the firm take? The Branch Manager commented that the Product Manager needs to evaluate the situation and resources requirements to get the project back on track. This may include coordination of resources within and cross teams, changing or lowering the requirements on some noncritical functions, adjusting the product deployment plan, changing the initial design or activating the backup plan. In short, the product manager is responsible for managing the product design and developing, testing and deploying processes by coordinating with all other teams, departments or

organizations.

When asked what he needs to coordinate with other (internal/external) parties or government agencies in the innovation process, the deputy Branch Manager answered, “It all depends on the innovation type and product design. For example, MYbank recently launched ‘Note of borrowing 借条’ (a message note for borrowing something/money between two parties) on Alibaba’s Online Purchase Platform. This new product concept transforms the traditional borrowing/lending process and the promissory note binding between two individuals from offline to online. The digital promissory note has legal capability as in the paper form. It simplifies the borrowing/lending process by providing a third-party witness feature on the platform. This simple form of individual P2P financing transaction (between two known persons) is based on the online transaction data. The lender can access and evaluate the credit rating of the borrower based on the transaction records of the borrower on Alibaba’s Online Purchase Platform. In such cases, the Product Manager from MYbank needs to work with members from the Online Purchase Platform of the parent company (Alibaba) in the design, development and operation activities.

The product team needs to obtain the target users’ account information from Alibaba, develop the product application portal on Alibaba’s platform and establish various cross-organization/platform co-work mechanisms, which include information sharing, user analytics, operation support, customer enquiry, platform interconnectivity and technical issues. The platform team may also provide product feedback and operation suggestions to the product team. The product team needs to adjust/modify the product features and functions to meet the deployment requirements. Besides, the product team needs to coordinate with the legal and compliance team to notify the regulator of the new product content and purpose. The Product Manager needs to ensure that the new product meets the regulatory requirements of a financial product. The legality of the digital promissory note has to be endorsed by the regulator and accepted by the legal system/court.

When asked about some less successful financial product development experiences, Product Manager said that many years ago, Alibaba tried to develop a company credit rating system based on the large amount of company transaction data on its online purchase platform. The product was unsuccessful due to several reasons. Firstly, although Alibaba had over one million online traders on its platform, not all were active traders/companies. Some traders only had small transaction volume. Secondly, the credit rating data generated was not well-received by users. The rating model and method was immature. Thirdly, there was a lack of application scenarios for the credit rating data. Users could not match the rating records with their specific

use cases. Fourthly. It was a big investment project. We were trying to build a search engine for a comprehensive company rating record. The project did not receive good market responses. In short, the project was a bit "overkilled" with the large scope and limited considerations for application scenarios. Some product developments might be terminated due to several reasons, including incomplete initial design, similar products launched in the market, changes in group/business strategies, lack of resources due to low priority.

When asked how the success or failure of a product is determined, the product manager said that it all depends on whether the new product meets the initial product objective (normally, a successful product will accomplish 1.5 times of the initial target). Not all products are totally new inventions. The new products also need to leverage on the existing deployment process, technology framework and technical tools to meet the performance target. Therefore, the product team will also be assessed on the on-time deployment, smooth system connection, reliable performance in high usage and error-free in the operations.

When asked about the role of technical or development team in MYbank, the Product Manager said, "*If the product manager is the engine, then the technical teams are the power system of the vehicles. They convert the idea into product by coding and programing. They are key persons in the system development, test and maintenance. MYbank, as a new start-up FinTech organization, is a very young company. Unlike Alibaba, we have very limited technology accumulation in the financial system establishment and operation experiences. We have limited reference or use cases. Therefore, our technical or development team needs to build most systems from the basic*."

When asked about how innovation is being promoted in MYbank, the interviewees commented that MYbank provides a positive environment for innovation. This includes "horse racing club" mechanism. Specifically, all people are encouraged to engage in innovative ideas generation and activities. Invention incentives and award recognition will be provided to the innovation winner or champion. In short, **the source and facilitator of innovation are (1) Product Manager, (2) innovation supportive mechanism and (3) top management thinking/mandate.** MYbank encourages "bottom-up" innovation development.

When asked about the level of innovation capability at MYbank – what are good and what we need to improve? The Product Manager said, "*We have good organizational structure, incentive scheme, teamwork and people mobility/development programs. These provide the soil for innovation capability development. On the areas to improve, I think we need to acquire more understanding and knowledge on the financial system and industry. We continued to recruit*

experienced leaders, industry specialists and subject matter experts from traditional banking industry. The blending of FinTech and traditional banking sparks new ideas in financial innovation."

What are the constraints to innovation in MYbank? According to the Product Manager, **the key constraint is the lack of industry knowledge and expertise.** The majority of the MYbank staff are migrated from Alibaba and they have limited knowledge about banking operations, China financial system and regulatory requirements. The Product Manager said, "*Most of us are trained in Internet application and platform development. None of us has formal financial or banking system training. As such, we need to expand our knowledge to go deep into various types of financial products. We need to 'walk out' of our IT comfort zone and 'walk in' the financial industry to understand the fundamental of financial systems and products. We need to overcome and narrow the knowledge gaps during the transition period. We need to transform from simple financial products adaptations/modifications to the development of more sophisticated financial instruments in the future.*"

What is the future direction of financial innovation developments at MYbank? The Product Manager said, ***"Firstly, we will continue to develop our baseline architecture**, such as transaction systems, deposits, loan and borrowing workflows, customer systems and online risk monitoring system. The baseline architecture is important, and we are building it from scratch. **Secondly, we will continue to improve the user experience.** For example, we make easy-to-use loan application and approval process which can be completed online in real time by the applicant with no or minimum image submission. We will continue to build our risk management model and credit scoring system by leveraging on our customer knowledge through big data analytics. **Thirdly, we blend the financial innovation with the group product/service portfolio.** Instead of following the development path of traditional banking products, **we leverage on the technology platform provided by Alibaba Group to develop cross-industry bundling financial services/products.**"*

What is MYbank's perspective on P2P lending? Will MYbank develop new products or innovation competency in this area? Said the Branch Manager, *"Overall, P2P is a new form of FinTech to remove intermediaries/mediators in the borrowing and lending process. Currently, MYbank does not engage in P2P activities. We remain cautious and continue to observe the industry and regulation development. There are many cases of defaults and collapses on the P2P platform and the trend is upward. In our opinion, although the P2P industry looks large and blooming, there are a lot of irregularities in this space, including the qualifications, investment security, risk resilience and compliance issues. MYbank, in my opinion, will not*

engage in P2P activities in the short term. But we remain open and closely observe the development." Regulations are being developed to govern the P2P industry, including the capital reserve, qualification, real-time operational risks monitoring and online disclosure.

What are the challenges to MYbank? According to the deputy Branch Manager, "*the first challenge is to develop good products that can meet the requirements of multiple stakeholders, including technical, regulator and SMEs. To develop good products, we need to have a strong knowledge base of the financial industry and user group/segment. The second challenge is the lack of talents who are good at both the Internet and banking operations. It is difficult to find a person who can speak both the IT and banking languages. What we do is to continue approaching banking experts to beef up our industry knowledge and expertise. At the same time, we also continue to recruit graduates from good universities. In short, we need to learn and develop our knowledge base in banking operations, regulatory requirements and new models in FinTech. We are working with the regulator to improve the regulatory framework for a healthy industry development."*

According to the interviewees, employees at MYbank are generally well-paid and provided with share options. They are recognized for their innovation/invention contributions in multiple ways, including promotion, bonus, award recognition and inventor copyright. The copyright inventors can be individuals or small groups. The firm helps register the inventor copyright in the name of individuals/small groups and usage rights in the name of the firm. The success in financial innovation is not just about creative ideas or individual capability. It was the platform (user volume and market influence) that turns a creative idea into success.

8.5 Summary: An Agile situational-based Innovation Model

As discussed in this chapter, MYbank adopts "continuous innovation" for process and service improvement; "breakthrough innovation" for new products or startup innovation; and "incremental innovation" for product features and enhancement of functionalities. The current "agile and situational-based" innovation model is suitable at MYbank for a new lean startup organization of digital banking products. Agile development was originally used in software programming, by which solutions evolve through collaboration between self-organized and cross-functional teams. It promotes adaptive planning, evolutionary development, early delivery and continuous improvement, and encourages rapid and flexible responses to changes. By reducing the burden of bureaucratic project management, they also freed programmers to

work more productively and with much greater satisfaction. MYbank is adopting different innovation processes for different situations, purposes and needs (a situational-based agile innovation approach). There is "no one-size-fits-all" but an agile innovation process that is self-organized and customer-centric at MYbank (a FinTech firm), as opposed to the traditional top-down, control-oriented innovation management at most traditional banks. Its agile innovation approach is situationally and organizationally adaptive to evolving regulations, customer-centric user experience and fast-changing digital economies.

What are the specific features of an agile innovation process implemented at MYbank? First, in the adaptive innovation development environment at MYbank, the project team adopted a "rolling wave" approach to schedule planning, which identifies milestones but leaves flexibility in the path to reach them, while also allowing for quick adaptation to changing realities. As opposed to a predictive development environment in most traditional banks, in contrast, predictors focus on analyzing and planning the future in detail and cater to known risks. Predictive methods rely on effective early-phase analysis and if this goes very wrong, the project may have difficulties changing direction. Table 8-5 below shows a comparison between adaptive and predictive innovation management methods.

Table 8-5: Comparison between adaptive and predictive innovation development

Adaptive innovation management	**Predictive innovation management**
Result-oriented	Task-oriented
Customer-centric development	Product-centric development
Mid-to-high risk tolerance	Low-risk tolerance
Creative and self-driven developers	Formal and experienced developers
Requirements change often	Requirements do not change often
A small team of developers	A large team of developers
Lean and flat culture that responds to change	Bureaucratic/hierarchical culture that demands order

Source: The author's analysis

Second, another key feature of an agile innovation process is iterative. In agile development process, testing is usually done concurrently with, or at least in the same iteration as, programming. Because testing is done in every iteration, users can frequently use those new

pieces of software and validate the value. After the users know the real value of the innovation, they can make better decisions about the innovation proposition. Having a value retrospective and innovation re-planning session in each iteration helps the team continuously adapt its plans to maximize the innovation value it delivers. Innovation is seen as a living organism, which actively changes due to environmental changes.

Agile innovation process is critically important in cross-platform co-development. Why? In cross-platform/organization co-development, the development speed, direction and final destination of innovation are sometimes predicted or pre-programed. Human resources may join and leave the co-development team during the process. New idea and market changes may bring significant change to the product design, features and proposition. Therefore, an open and adaptive approach in co-development will help ensure that the innovation development continues to stay close to the market requirements and customer value-proposition. Constant checking and revision help improve the product relevance in the fast changing and complicated world of digital money business application.

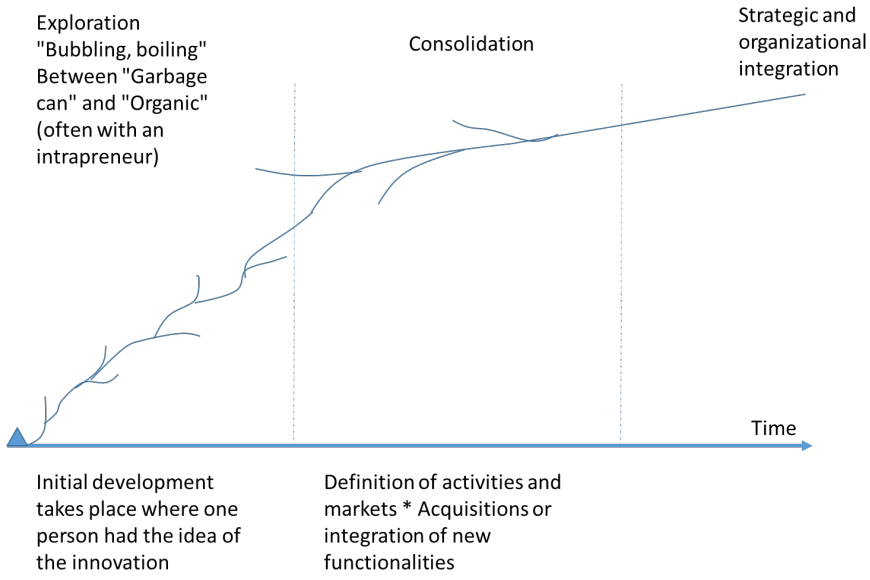

Figure 8-9: Innovation process: The “Progressive” model with “intrapreneur"

Source: Romelaer (2015)

Different from the previous mentioned model, MYbank seems to have adopted a “Progressive” model with “intrapreneur” based on Bahrami and Evans (1988). The fundamental theories for this model can be traced back to Woodward’s (1958) Contingency Theory; Beck’s (1999, 2001) Agile Software Development Approach; DiMaggio’s (1988) and Battilana’s (2012) Institutional Entrepreneurship Theory. The contingency theory advocates that (1) organizations are open systems that need careful management to satisfy and balance internal needs and adapt

to environmental circumstances; (2) there is no one best way of organization. The appropriate form depends on the kind of task or environment one is dealing with; (3) management must be concerned, above all else, with achieving alignments and good fits; and (4) different types or species of organizations are needed in different types of environments. In short, the innovation model at MYbank is flexible, adaptive and situationally dependent. This is well aligned with Beck's (1999) agile software development approach, by which solutions evolve through collaboration between self-organized and cross-functional teams. It promotes adaptive planning, evolutionary development, early delivery, continuous and progressive improvement, and encourages rapid and flexible response to change.

An important element in MYbank's innovation model is "intrapreneur" or "internal institutional entrepreneur". DiMaggio (1988) first introduced the notion of institutional entrepreneurship in institutional analysis to explain how actors can contribute to changing institutions despite pressures towards stasis. Battilana (2012) further distinguished two key categories of enabling conditions, namely, field characteristics and actors' social position. Institutional entrepreneurs need to (1) initiate divergent changes; and (2) actively participate in the implementation of these changes. The field characteristics at MYbank are pro-innovative environment, "cannot rest on old success" and "bottom-up grassroots open innovation". The product manager can be regarded as intrapreneur, who is responsible for the whole end-to-end development process, with an innovative mindset/awareness continuing to drive new (exploration and exploitation) inventions to create new killer applications and upgrade the existing products in the market. Product manager with the highest formal and social position in the project team initiates the change and actively participates in the implementation of the change.

According to Romelaer (2015), the key advantages of this innovation model are (1) flexible, adaptive and creative at the initial stage; (2) the person who initiated an idea becomes the "intrapreneur" to promote the innovative idea opportunity. Once the idea is accepted by the firm, the idea owner will become the project manager. For example, at A FIRM/MYbank, under the "horse racing" program, individuals or small groups are encouraged to submit their innovation ideas to the innovation board. Once the innovation idea is accepted, the firm will provide all the necessary resources and funding to sponsor the fertilization of the idea into actual production.

However, this model requires the management to encourage new ideas and initiatives and limit their number, as there is a delicate balance between the two. In addition, the management also needs to continuously recruit, encourage and motivate people who have adequate

personalities, energy and competencies to be intrapreneurs. For example, at A FIRM/MYbank, under the "inventor copyright" program, staff and business partners are able to register "intellectual property protection" as copyright owner in the cooperation program. For internal invention, additional recognition (like career promotion) and monetary reward will be given to the creator. Key challenges to this model are when there are more ideas than what can be handled by the firm, there might be risks of invention disorder, loss of time, poor use of resources and competencies. In addition, excessive attention to intrapreneurs can cause the firm to believe that all innovations must begin locally with small actions.

Some innovations are external and require major investments. Finally, this kind of innovation model is suitable for organizations with the following characteristics: (1) small and young technology startups with strong institutional entrepreneurship and recognition for creativity and performance excellence; (2) Co-development innovation environment to identify/nurture internal talents and external co-developers; and (3) a pro-innovation culture and an effective incentive system to recognize innovation and contribution.

This **"Progressive"** innovation model **with "intrapreneur"** is suitable for MYbank and aligns with its innovation strategy of leveraging on mobile Internet, big data and cloud computing technologies to create **differentiated cost, data, channels and customer competitive advantages.** In this regard, MYbank is an innovative cloud-based bank that s willing to take moderate risks to penetrate the Chinese financial service market which has long been dominated/monopolized by LCBs. Leveraging on big data, MYbank aims to offer more personalized products for consumers through "programmable financial services" which means that individual credit rating and personal financial planning can be pre-programmed to develop "targeted push-through financial offerings". MYbank formally started operations in July 2015 and 2/3 of the employees were technocrat IT engineers. MYbank has lots of innovation experiences brought over from its parent company such as the horse racing, copyright and creativity incentive programs. As a technology firm, MYbank is open to co-development and IT platform integration to enlarge its market shares and influences. Therefore, this type of innovation model is adopted at MYbank to promote creative innovation through IT and individual contribution.

The next chapter studies the innovation process at WeBank, an online bank sponsored by Tencent Group, which is the largest social media platform and game operator in China.

Chapter 9: WeBank Case Study

Headquartered in Shenzhen, WeBank was founded in December 2014 with an initial paid-up capital of RMB three billion. WeBank is backed by Tencent which is its single largest shareholder, with an estimated 30% ownership. WeBank's most popular service is "**Weilidai**" (micro loan), providing unsecured personal loans ranging from approximately USD 70 to USD 44,000 (RMB 300,000). Weilidai is available through Tencent's popular WeChat messaging app with more than 650 million users. Its standard interest rate is 18% annually with a borrowing period from one single day to 20 months. It gives borrowers the flexibility to borrow and return at any time. From May 2015 to August 2017, Weilidai amassed an outstanding loan balance of RMB 100 billion, on par with the loan book of leading Chinese CCBs. Weilidai is WeBank's first online consumer loan product. Weilidai is currently "by-invitation" only, but WeBank is in the process of opening itself up to the public without Friends' invitation.



Figure 9-1: WeBank's Weilidai

Source: WeBank's website

"**WeBank App**" is another standalone product that integrates withdrawal, transfer, and wealth management in one application for easy personal finance management. Through its simplistic design, WeBank can bring to its inclusive banking users a refreshing and convenient banking experience. By combining big data analytics and online technologies, it can provide "**SME Loan**", an innovative financial product that is totally online, free from paperwork or collateral, and with immediate evaluation and access to funds. WeBank's SME loan product affords complete flexibility and convenience with no early repayment penalty. "**SME Banking App**" is WeBank's another application for SME customers to access financial services through their mobile devices. And "**Weichedai**" (Car Loan) is WeBank's innovative auto loan product developed in partnership with China's leading car dealerships.

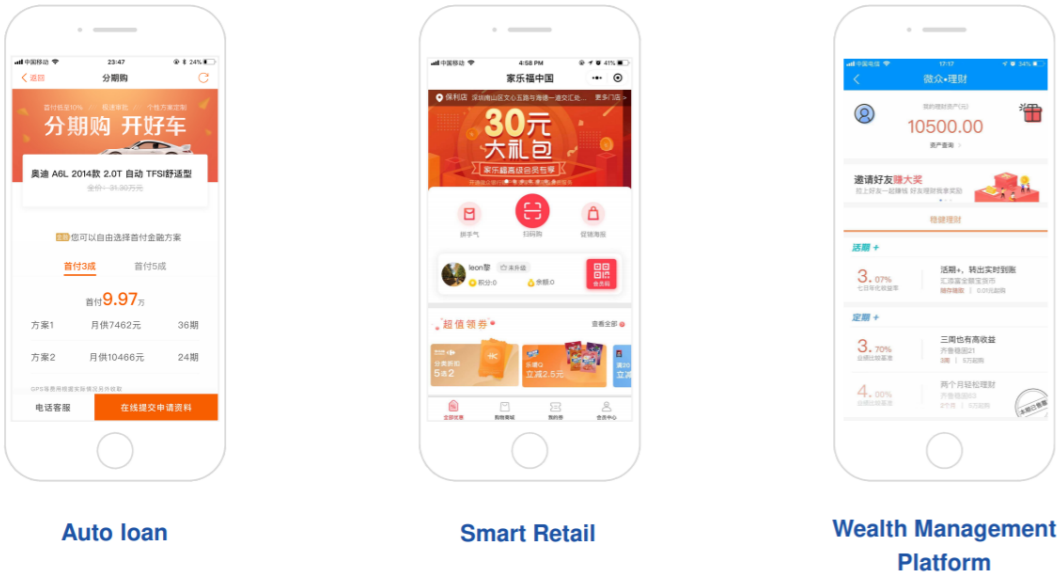

Figure 9-2: WeBank's Wechedai

Source: WeBank's website

To allow a 7x24 digital banking experience, **56% of Tencent's employees are IT staff.** It stresses product design, data analysis and technology, while it may rely on traditional industry players as partners for capital, risk management and products. WeBank cooperates with more than 40 banks in China, with up to 80% of the capital coming from these partners that are reimbursed through a profit-sharing agreement. Given all the user data that Tencent has accumulated through its QQ and WeChat messaging services, Weilidai loans are approved in a few seconds.

As the first digital-only bank in China, WeBank provides high-quality financial services to mass retail and MSEs mostly on mobile and other online platforms. WeBank strategically focuses on the oft-stated "ABCD" technology (A.I., Blockchain, Cloud Computing and Big Data) and actively conducts research in related technologies. In 2018, WeBank furthered its commitment to financial inclusion by launching WeBank FinTech to promote the Open Banking ecosystem to enable inclusive and contextual financial services for international partners.

In the recently published "2019 China Internet Report", WeBank was listed as one of the 14th "Top Chinese Internet Players" with a valuation of USD 21 billion. Goldman Sachs went even further and attributed a valuation of USD 29 billion following Tencent's latest earnings report. Compared to leading European direct banks like Monzo or N26, with a valuation of USD 2.5 billion and 2.7 billion in their most recent rounds of funding, respectively, WeBank is considered one of the favorable FinTech firms in the world.

9.1 Environment

In 2015, the government launched the first guidelines to promote private commercial bank development. The guidance was issued by the State Development Planning Commission and encouraged private companies to set up private commercial banks with their own funds in order to help meet the needs of SMEs that struggled to obtain what they needed from the existing banks. The guidance stressed that private commercial banks should establish a sound risk control system and set up differentiated market positioning. This was again emphasized in the subsequent guidance on private commercial bank supervision issued by CBRC. In July 2014, CBRC announced that the first three private commercial banks had been approved followed by two additional banks two months later. Seeing this signal, many companies stepped up to apply for a license. In 2016, 11 more received approval. And the latest one received the permission in January 2017. So now in total there are 17 private commercial banks in China.

Tencent, Alibaba and Baidu are the first few technology firms participating in this private banking pilot program, pioneering FinTech innovations in China. Tencent's principal businesses were social media and gaming, Alibaba e-commerce and cloud service, and Baidu search engine and cloud storage. None of them had prior experience in banking business, but financial services were not new to them. Both Tencent and Alibaba have been involved in third-party payments and digital financing businesses since 2004 and 2006 respectively, which provided them with early exposure to financial regulations and credit risks management. Baidu teamed up with CITIC Bank and PayPal to offer digital banking and financial services in China. Baidu's banking model is revealed in next chapter.

WeBank and MYbank were among the pilots in the private banking program which aims to provide inclusive finance and digital banking services to unbanked individuals and SMEs – a long-acknowledged issue in China's banking system. Today, WeBank serves SMEs through its WeiYeDai (micro unsecured finance) product, and offers micro loans to consumers through another, WeiLiDai. All China's biggest tech players – Alibaba, Baidu, Tencent and JD.com (ABTJ) – have made incursions into financial services. They offer services in banking, broking, insurance, payments, consumer finance and wealth management through their large user-base mobile app.

So far, WeBank has been the leader in assets, loans, net profits, return on equity and NPLs. In 2018, WeBank reported a revenue of RMB ten billion and a net profit of RMB 2.5 billion,

compared to its first year's operating results of a loss of lost RMB 538.8 million in 2015. In late 2018, WeBank was valued at RMB 147 billion ($21 billion), making it one of the world's largest unicorns. During an interview, WeBank's CIO Henry Ma, said "*WeBank meets the requirements for public listing, but I do not yet feel the need to do it. Using our big data-driven credit scoring system, we maintain a low NPL ratio of around 1%. We are not to compete with traditional banks, but just to make the world flatter: to link small entrepreneurs with credit using technology. We are building the first ever distributed banking system based on cloud computing technologies and the blockchain.*"

WeBank takes an off-balance sheet approach in managing its financial position. Only 20% of WeBank's loans end up in its own balance sheet, with the vast majority syndicated out to local lenders close to the borrowers. WeBank tends to depict themselves as middlemen more than MYbank does. And it is also considered politically smart to reduce regulatory risks. However, this does not exclude WeBank from the regulatory scrutiny. In August 2019, WeBank was fined RMB two million by CBIRC for multiple violations, including irregular loan issuance, non-compliance in management appointments and employee misconduct. Borrowers were found using consumer loans from the bank to invest in real estates, stocks and futures trading, which were against the regulations and banks' policies. China Guangzhou Development Bank and ABC were fined around the same time for similar violations. CBIRC is exercising a consistent level of regulatory scrutiny on digital banks (such as MYbank and WeBank) like on traditional banks.

In addition to WeBank, Tencent also owns WeChat, the most popular messaging app in the Chinese community, with more than one billion Chinses using it globally. Leveraging on the massive user group, WeChat Pay (a digital wallet within WeChat) became the choice of payment with 900 million active users in China alone. Globally, Chinese tourists have been able to use WeChat Pay to shop in the US and Europe using a module called Travelex Pay, through with domestic and overseas banks complete Forex and international clearance.

Before WeBank was launched, Tencent was already offering financial products on its WeChat platform – a fund called LiCaiTong (Smart Wealth Management) back in 2014 and was launched with Huaxia Bank (a private Chinese bank) on the premise of offering interest rates 16 times higher than in the market. Today, WeBank is building the first ever distributed banking system based on cloud computing technologies and the blockchain.

Perhaps it is interesting to study the competitive advantages and limitations facing digital banks. Firstly, both MYbank and WeBank are online and data-driven banks, focusing on

unsecured loans. They take advantage of the data and technology from their parent company. Based on this data, both of them have their own methods to evaluate individual credit before deciding how much loan should be issued to the borrower in several seconds. Big data credit modeling also helps these banks with credit risk valuation systems and issuance of loans to SMEs without PBOC credit records and mortgage assets. Secondly, both banks are facing challenges as they cannot open T1 debit accounts as T1 accounts require face-to-face ID checks. Limitations on deposit level also impose challenges to both banks to keep cost of capital low. Both banks are principally operating online. In rural areas, people trust more in a branch where they can go to and find people to talk to, rather than putting money directly into an invisible online account. Thirdly, both banks focus on consumer finance or small loans, facing competition from consumer finance companies, internet small loans and P2P loans, all of which are businesses with low margin but high risks. But in short, financial services are moving to the user side (see Figure 9-3 below).

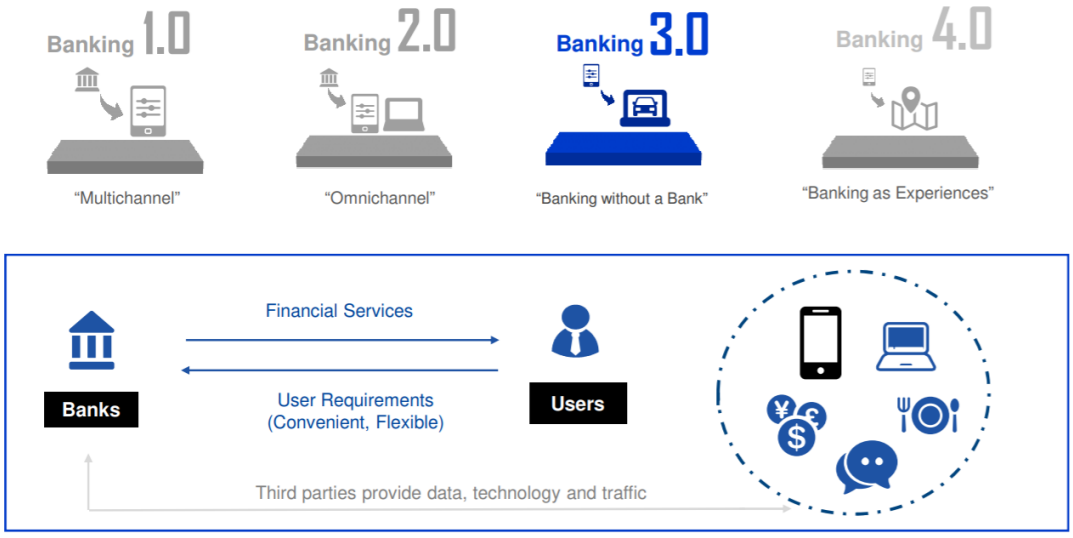

Figure 9-3: WeBank's concepts of branchless banking

Source: WeBank

9.2 Business Strategy

In an interview, Henry Ma, EVP and CIO of WeBank revisited WeBank's digital journey and suggested how to reconcile the contradiction between improving financial inclusion and building a sustainable business. "*We have a very clear goal — promoting financial inclusion*

and achieving a sustainable business. Only by leveraging the power of technology can WeBank drive financial inclusion at scale. Our visions are promoting inclusive finance through open source platforms and collaborative business partnership."

To date, WeBank is one of the largest digital banks with over 170 million retail and SME customers. From the beginning, WeBank has adopted new generation FinTech capabilities in the areas of ABCD (AI, blockchain, cloud computing and big data). Apart from embracing FinTech, WeBank's technical team has created an "agile governance structure" based on decentralized operations with coordinated control. In addition, WeBank also nurtures a culture of trial-and-error with low cost, encouraging bottom-up innovation and empowerment of individual employees.

While WeBank has already found its position in the digital transforming banking industry, it is also actively looking for partnership and collaboration to take a step further in promoting financial inclusion through new technologies and the *"3O" open banking model (open platform, open innovation and open collaboration).*

- Open Platform entails the use of such technologies as API, SDK and H5 to provide banking services for partners.
- Open Innovation encourages open source software, intellectual property licensing and reference implementations to empower partnerships.
- Open Collaboration fosters business alliances on top of distributed technologies.

This model enables banks to embed their products, risk management, technology and financial service capabilities into specific scenarios and industries. In return, it will help banks approach target customers more effectively, enabling more inclusive and contextual financial services.

WeBank's business operations can be broadly divided into three key business groups or segments.

(1) Consumer Finance Business

Consumer Finance business is one of WeBank's current main businesses. The business is carried out on Tencent's WeChat and QQ platforms, and consumer loans are issued to users who have needs on the platform. "Micro-loan" is the most important consumer financial product and the first microfinance product on the Internet by WeBank. It was officially launched on mobile QQ and WeChat platforms on May 15, 2015 and September 21, 2015. As two large social platforms in China, WeChat and QQ had had 805 million and 899 million monthly active

accounts respectively by the end of June 2016, providing a huge user base and rich social data for the online development of WeBank. This gave WeBank unique advantages in marketing channels and risk management.

Nowadays, micro-loan is 100% online operation right from loan application to completion of the loan process. All loan processes can be completed on mobile phones. WeBank's risk control model is based on rich user social data. It actively screens customers by establishing a whitelist system, while objectively evaluating the customer's credit level and giving a comprehensive score based on the traditional credit review system to make decision on whether to grant credit and the specific credit limit to provide to a specific target. Micro-loan is a short-term consumer financing product with daily interest rates being between 0.02% to 0.05% for periods of five, ten, and 20 months. The repayment methods include monthly installments and equal principal repayment. Micro-loan is a joint loan product under the mode of "Interbank Cooperation" and WeBank. The 20% loan capital comes from WeBank and 80% from partner banks.

(2) Platform Financial Business

WeBank also cooperates with Internet e-commerce platforms to embed bank loan products into the consumption scenarios of the partner platforms. The platform financial business was officially launched on September 23, 2015, and the first product was the Uxin used-car "financing" product launched by WeBank and the used-car e-commerce platform Uxin. In this cooperation model, WeBank considers the specific consumption scenarios of the cooperation platform and the characteristics of customer needs, provides customized loan products and embeds them into the partner platform. Platform customers can submit loan applications through the platform software entrance.

In this kind of cooperation model, based on the basic customer, channel and consumption information provided by the partner platform, WeBank reviews the client qualifications, gives a risk score and finally makes a loan decision. The access criteria for customers are jointly developed by WeBank and the partner platform. At present, WeBank's cooperation platforms mainly focus on housing, car and life services, including the logistics platform "Huitong World", the used car e-commerce platform "Youxin Used Car" and other Internet e-commerce platforms.

(3) Wealth Management Business

WeBank helps distribute its WMPs issued by partner financial institutions on its wealth management mobile app. WeBank has so far sold about 20 WMPs, for holding periods of one month or more at annual yield rates of somewhere between 4% to 5% with flexible withdrawal.

In this cooperation model, WeBank reviews and screens partner financial institutions and consignment products. WeBank will comprehensively evaluate the brand strength and past performance of the partner's financial institutions, and determine the amount of WMPs for each financial institution to go online, and when to decommission.

In the agency or brokerage of partner banks' WMPs, according to regulatory requirements, WeBank plays the role of product admittance and rating, user risk profiling and scoring, product promotion and distribution, subscription and payment collection, daily yield calculations, *ad hoc* withdrawal and settlement upon product maturity. Besides, WeBank provides agency sales channels for funds, asset management and insurance companies. Relying on its mobile app platform, WeBank distributes products such as funds and insurance to its customers. WeBank and its partner funds and insurance firms then divide the fee income from funds and insurance agency sales.

9.3 Business and Innovation Performance

By December 31, 2019, WeBank had had over a hundred million customers with an asset size of RMB 220 billion. It also had an NPL ratio of about 0.5%, which was "significantly lower" than that of similar loans offered by traditional banks, said Ma. The bank, which recorded a profit of RMB 2.47 billion in 2018, had been profitable since 2016. We-Bank's account IT operation and maintenance costs were approximately 10% of other domestic banks, dropping to 3.6 yuan per account last year (2019)", said the CIO. "*Compared to traditional banks, at present the big state-owned banks have IT operation and maintenance costs of roughly 20 yuan per account, and the cost for small and medium-sized banks is generally five times higher, at over 100 yuan per account. All these provide us with a good opportunity to serve the long-tail market, those unbanked individuals and sole proprietor SMEs.*" The Head of FinTech Innovation added, "*For overseas banks the minimum IT operation and maintenance cost is approximately USD 14 per account, and in general around $100. Our target is to lower the operating cost to less than five yuan per account by 2023*"

In terms of AI innovations, WeBank is building a series of advanced AI applications for financial inclusion scale-up and technology-driven financial ecosystem. One of them is Federated AI Technology Enabler (FATE), China's first industrial level federated learning platform open sourced by WeBank. FATE helps businesses and organizations build AI models effectively and collaboratively by using data in accordance with user privacy protection, data

security, data confidentiality and government regulations. So far, it has already been applied in credit, insurance, supervision and retails.

In term of blockchain innovations, WeBank also provides comprehensive blockchain solutions including the infra platform FISCO (Financial Blockchain Shenzhen Consortium) BCOS, middleware kits WeBase, and applications including WeIdentity and WeEvent:

- FISCO BCOS (Be Credible, Open & Secure) is an open consortium chain platform, built with an aim to facilitate partnerships and inspire collaboration amongst businesses. It is the largest open source consortium chain ecosystem in China with over 10,000 members (over 500 enterprise members). And it has launched more than 60 applications in interbank reconciliation, tourism finance, supply chain finance, judiciary services, copyright protection, entertainment and gaming, as well as social management and public services.

- WeBASE (WeBank Blockchain Application Software Extension) is a bridge connecting applications with the blockchain infrastructure.

- WeIdentity is an open source solution which offers a safe and efficient solution for identity authentication and data cooperation based on blockchain.

- WeEvent is a distributed event-driven architecture developed for cross-institutional and cross-platform event notifications in loosely coupled systems that support the Collaborative Business models.

In term of cloud solution innovations, WeBank adopted and reinvented many cloud-based technologies including Fintech Sandbox and WeCube. WeBank FinTech Sandbox is a virtual innovation lab designed for individual developers, as well as technology and business partners. It provides a testing ground to build, demonstrate, share, augment and test cutting edge financial technologies, reference implementations as well as various other business applications and solutions. "*We encourage FinTech innovators to build their own disruptive business models based on technologies which have been tested and proven at scale and applicable for a multitude of use cases including virtual banking, supply chain finance, mobile payment and smart retails*", said the Head of FinTech Innovation. WeCube tackles the challenges of managing a fully distributed architecture requiring smart ops and maintenance tools for higher efficiency. It is the all-in-one tool to address the issue as being an open-sourced and self-evolving work platform.

In the big data innovations, WeBank designed WeDataSphere by extracting the essence of its financial-grade data technologies. It is a platform with financial grade computing, data

storage and exchange, and machine learning capabilities developed based on various open-source components like Hadoop, spark, HBase, KubeFlow and FFDL. Enormous enhancements and reinforcement efforts were made by WeBank on top of the open-source components to tackle financial application issues related to security, performance, high availability, and traceability.

In the recently published 2019 Global Banking Patents Rankings (Top 100) by IPRdaily, WeBank, a world leading digital bank, jumped from the fifth place (2018 Rankings) to top the year's rankings with 632 filed patents. Of all patents WeBank filed in 2019, 80%were related to ABCD technologies.



Figure 9-4: WeBank's FinTech patents

Source: WeBank website

In terms of AI, WeBank constructs a technology-driven financial ecosystem with advanced technologies of federated learning, new generation of human-computer interaction, AI marketing and AI asset management. Its AI patents cover federated learning, NLP/Intelligent Speech, machine learning, advertising/recommendation tech, computer vision, and more. When it comes to blockchain, WeBank has a complete set of open source consortium chain infrastructure, middleware and solutions with patents of algorithm, privacy protection and cross-chain tech. According to a recent report from the Block, WeBank filed the third most blockchain patents globally in 2019. It was also the only bank on the top 10.

An increasing number of patents filed indicates the banking industry's growing FinTech capabilities. Rather than build a heavily guarded fortress with those capabilities, WeBank determined to empower developers with open source FinTech in a collaborative ecosystem. In 2019, WeBank announced the open source FinTech strategy targeted at collaborating with developers around the world. So far, it has brought out dozens of successful open source

projects, such as FATE, FISCO BCOS (consortium chain platform built together with FISCO open source taskforce team) and open-source big data platform suite WeDataSphere. Currently, FISCO consists of over 100 consortium members. WeBank is also the world's first bank to fully deploy its core banking systems on private cloud. It has constructed a 100% in-house designed distributed core banking system with self-owned intellectual properties, capable of handling high-volume, high-frequency transactions. WeBank's big data platform houses over 15 petabytes of data, with over 300 thousand batch jobs being processed daily. "*Even by China's standards, WeBank's growth has been incredibly rapid, far outpacing the performance of traditional banks. Today, the digital bank profitably serves more than 100 million previously underserved customers and processes more than 300 million transactions per day*", said the big data engineer.

WeBank launched a personal micro-loan product ("Weilidai") and an SME loan product ("Weiyedai"), among many other purely online products, with over 100 million retail customers and over 500 thousand SME customers as of 2018. WeBank also deployed China's first distributed core banking system, capable of handling high-volume, high-frequency transactions. It has applied for 234 tech patents in total.

In May 2019, the Hong Kong University of Science and Technology (HKUST) and WeBank Co. Ltd (WeBank) established the HKUST-WeBank Joint Laboratory to explore cutting-edge technologies and nurture talents. Leveraging on both parties' advantages in research and knowledge transfer abilities in the Greater Bay Area, the joint lab will collaborate on research areas spanning AI, big data, blockchain as well as financial and regulatory technologies. This collaboration also serves as a high-level collaborative innovation platform for enterprises, universities and research institutes and to promote knowledge transfer under the GBA Development Framework.

Some research topics of the joint lab include: how to protect data privacy amid sharing of resources and how to establish blockchain consortiums or apply new technologies such as the collaborative business model. The lab will seek to increase banks' risk management capability by monitoring bank transactions and assisting officers in risk analysis and system maintenance work through machine learning and data mining. It will also seek to enhance the banking industry's development through FinTech and other cutting-edge technologies. Nine research proposals have been summited to the joint lab so far in the fields of blockchain, risk management and AI.

In Feb 2019, WeBank signed a collaboration agreement with the Macao Science and

Technology Development Fund, established by the Macao government. The two parties will collaborate in the development of Smart City infrastructure, public services, government administration, and talent development. According to both parties, the first collaboration project is based on "WeIdentity", an Entity Identity Authentication and Trusted Data Exchange project. In the traditional model, the exchange of personal data across agencies and departments poses many problems. WeIdentity offers a secure and efficient solution for inter-institutional identity authentication and data cooperation through Blockchain, providing technical support for e-government services in Macao and enhancing the service experience of Macao residents.

WeIdentity R&D team leader Hata Fan said, "*WeIdentity is independently developed by WeBank as an open source project to the public. Based on the W3C DID (World Wide Web Consortium Decentralized Identifiers) specification, it is the solution for decentralized identity management, and standardized and verifiable data exchange, which we developed on top of the underlying FISCO BCOS Blockchain platform. This solution can better solve problems related to data silos and data misuse. It can also be widely applied to a variety of fields, including government services, healthcare, and finance. It is worth mentioning that WeBank has also become a member of the Decentralized Identity Foundation, an authority in the area of international identity certification. We fully expect to be providing more cross-industry and regional solutions for governments and enterprises using international standards going forward.*"

With technology deeply embedded into the bank's DNA since inception, WeBank continues to drive improvements through the development of leading technologies. Investment into technology R&D accounts for more than 30% of the total expenditure at the bank with more than half of all staff serving in technical roles. Since 2015, WeBank has been a leader in the development of Blockchain and distributed ledger technology. Relying on its core technological expertise in Blockchain, WeBank has made great advancements in R&D, use case exploration, industry knowledge exchanges and government cooperation on the topic of Blockchain.

The CIO of WeBank believes that **the source of innovation at WeBank is from its open banking model. WeBank has been promoting the open banking concept since its establishment.** Gartner (2019) defined *"Open Banking" as a platform business where data, algorithms, transaction records and procedures are shared within the ecosystem to provide services to partners including customers, employees, third-party developers, FinTech companies and vendors.* What does it mean at WeBank? The CIO believes that the open banking model enables banks to embed their product, risk and technology capabilities into specific industries while in turn banks are able to approach their target customers more directly. Using

WeBank's open banking system, banks can provide context-based financial services where customers need them most under various scenarios while partner businesses through Application Programming Interface (API) connection to better serve their customers. As a result, banks can reach the traditionally unbanked or underbanked long tail market and effectively promote inclusive finance. "Open Banking" attracted tremendous attention from banks in China in the past year (2018) and many of them launched open banking platforms based on API technologies.

According to the CIO of WeBank, **open banking is more than API technology and is characterized by the "3O" Paradigm, namely "Open Platform", "Open Innovation" and "Open Collaboration"** (the 3Os were explained in the WeBank's strategy section). At the moment, WeBank is proactively practicing the "3O" Paradigm and applying its leading-edge technologies in use cases of the financial industry as well as those of its partners in other industries including legal services, media, entertainment, public and government services and retail businesses.

"*WeBank strives to be an innovator for contextual financial services, a pioneer in the technology community and an architect of the collaborative business ecosystem*", according to the CIO. "*With the development of open banking, risks and challenges arise, too. Cybersecurity, connectivity with diverse and numerous partners, business continuity, data privacy and company culture are typical areas to address*", said the Legal and Compliance Manager. To tackle these issues, it is necessary to come up with end-to-end cyber-risk assessment mechanisms, apply innovative technologies such as "Open Consortium Chain" to simplify connectivity with partners, establish comprehensive business continuity plans, introduce blockchain-based distributed identity and privacy protection solution, and nurture a culture of agile and decentralized decision making. These are believed to be some of the most important best practices for the Open Banking at WeBank.

75% of WeBank's individual borrowers are blue-collar; moreover, the average loan size is only USD $1,180. WeBank's SME borrowing customers are all relatively small private companies, with 10 employees on average. For 66% of these SMEs, this is their first time receiving a loan from a financial institution, with an average loan size of USD 30,000. At the interview, the researcher said "*If you look at our loans, the [average size] is about USD 1,180 and the average duration is only about 50 days. About 72% of these loans carry an interest amount of less than RMB 100. If I were to ask traditional bankers if they wanted to take up these loans, most of them would decline,*" **The large volume and small ticket nature of these loans are the key drivers for WeBank to build their low-cost technology infrastructure to**

serve this segment. "*In fact, the average annual IT cost-per-account is only USD 0.50, as compared with most incumbent banks which operate equivalent account at a cost of six to 30 times that amount. Additionally, customers applying for credit approval can receive their application result in under 5 seconds and funds draw-down in under one min.*" said the Product Manager. WeBank operates 24 hours every day of the week to ensure that its customers are able make transactions at any time. "In fact, most of the transactions that we have done happened outside office hours, when bank branches were closed", said the Senior Technology Manager.

9.4 WeBank: Aspects Related to Research Questions

Data in this section were primarily based on interviews with officers from WeBank. To make the interview discussions more specific and concrete, the interviewees were asked to share specific examples from their business functions and describe the innovation and compliance process in detail. The interviewees were senior officials from WeBank including Head of Regional Fintech Partnerships, Senior Technology Manager of Collaborative Business, Senior Researcher of AI Department, Chief Architect of WeBank Open Platform, Product Manager of WeBank Open Platform, Senior Blockchain Architect, Big Data Engineer and Legal and Compliance Manager.

9.4.1 Financial Innovation Process

The innovation process at WeBank can be analyzed in two levels. **At an enterprise level, WeBank adopted an open innovation process with emphasis on the "3O" Paradigm, namely "Open Platform", "Open Innovation" and "Open Collaboration". At the product level, WeBank applied a micro innovation process with focus on speed and flexibility.**

At WeBank's inaugural FinTech Day on July 26th, 2019 in Shenzhen, the CIO announced the theme of "Open Source Ecosystem: Unlocking Infinite Potential and Propelling Open Innovations". For the first time, WeBank introduced in full the innovation progress and open source path in the field of FinTech. It launched 10 applications and modules of its open source solutions as well as kicking off FinTech accelerator program "WeAccelerator". "*WeBank, as the practitioner of open banking strategy and the collaborative business infrastructure provider, is committed to utilizing open source technology to help industry partners enhance business value*," said the CIO during WeBank's FinTech Day. The figures below summarize WeBank's

open banking model.

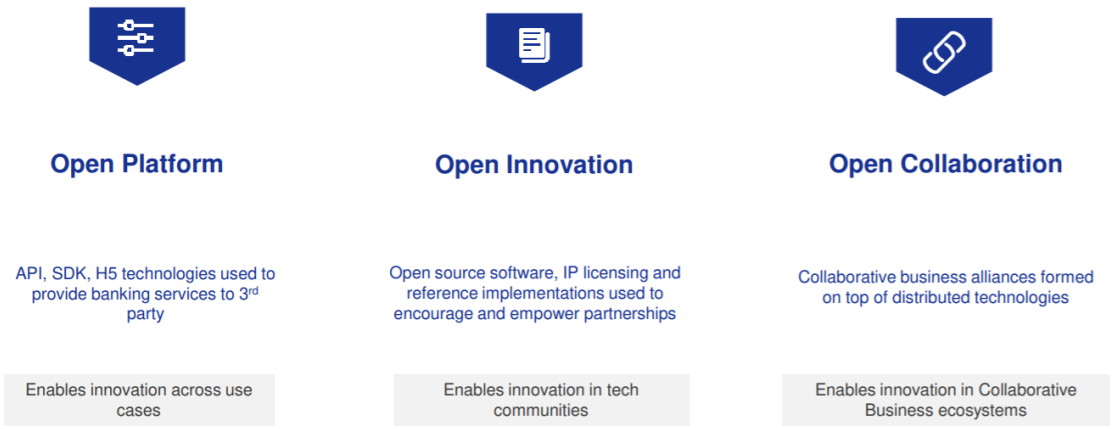

Figure 9-5: WeBank's Open Banking Model

Source: WeBank website

At the forum, WeBank showcased the development progress of its FinTech over the previous four years and released a number of its FinTech solutions under open-source license. WeBank also shared its experience in fostering an open-source ecosystem in both domestic and overseas markets and emphasized WeBank's contributions in promoting open source culture in the industry. In particular, WeBank advocated that technology should be considered the core competency for banks to stay competitive in the new business ecosystem. On the one hand, **banks are encouraged to optimize patented and open-source technologies to foster innovation.** On the other hand, **banks sharing their technologies under open source licenses benefits the industry and partners as well as promotes development of the ecosystem.** The CIO cited open innovation as the key to attracting more opportunities, saying that tech giants like Google and IBM have opened up their technology stack and are going open source. "*WeBank is doing the same by opening its APIs and software programming toolkits to partners so that its financial capabilities can be embedded into their ecosystem. If a bank wants to stay competitive in the new economy, it first needs to collaborate with the different players and innovate together,*" said the Head of Regional Fintech Partnerships.

In terms of AI, WeBank has released Pan-robot AI technology, FATE open source platform of a new generation of federated learning technologies, financial-grade AI advertising and AI wealth management tools. On the blockchain side, WeBank unveiled its blockchain open source landscape which included WeBASE, a bridge connecting applications with blockchain infrastructure, WeIdentity, a solution of digital identity and trusted data exchange based on Open Consortium Chain, and WeEvent, the distributed event-driven architecture based on

blockchain technology. For distributed architecture and big data areas, WeBank released a series of open platform applications and solutions, including WeBank FinTech Sandbox; "MicroCore", a new generation of online banking core system architecture concept; WeCube, the distributed architecture management framework and WeDataSphere, big data platform suite.

In fact, WeBank has already developed use cases in various industries. For blockchain technology, FISCO BCOS, an infrastructure platform led by WeBank and jointly launched by other FISCO members, together with its open source WeIdentity, a solution of decentralized identifiers, have been put in use to provide technical support for e-government services in Macao to elevate the service experience of Macao residents. Recently, WeBank and the media outlet *People's Daily* Online jointly released a copyright protection platform based on FISCO BCOS to protect user-generated content via blockchain technology.

As the collaborative business infrastructure provider, WeBank continuously opens up its leading AI, blockchain, cloud computing and big data technologies and a series of financial-grade applications, to infuse its partners with WeBank's open innovation capabilities of FinTech and work hand in hand with partners to jointly create the future of collaborative business.

WeBank FinTech Accelerator "WeAccelerator" was released in July 2019. "WeAccelerator" is positioned as the "connector" to realize WeBank's "3O Paradigm of Open Banking", leveraging the platform and technical advantages of WeBank, as well as WeBank's ecosystem resources to recruit innovative enterprises. It provides a full range of support from new technologies and industry resources to consulting services of expert panel to help accelerate the growth path of member startups.

During the interview, the CIO was excited about the potential of the collaborative business model. "*It will change the future business environment and enterprises will become more sophisticated within their niche fields. Open collaboration will guide the collaborative business partners to jointly develop business infrastructure and incubate more innovative business models*". WeBank is committed to putting the idea into practice. Based on the existing resources, service capabilities and ecosystem, WeBank will be rooted in FinTech arena to help partners grow their business with open source technologies including AI, blockchain, cloud computing and big data.

As one of the world's leading digital banks, WeBank also reaches out for international collaboration on promoting financial inclusion through FinTech. Alan Ko, Head of Fintech Innovation (international) at WeBank, addressed WeBank's open mindset towards promoting digital financial inclusion. "*FinTech holds the potential to revolutionize future financial services,*

that is why our FinTech solutions have garnered so much attention here at the event, especially our showcases in fields like AI, blockchain, cloud computing and big data. As a technology innovator in the world's leading digital bank league, we are actively looking for partnership and collaboration to take a step further in promoting financial inclusion through new technologies." "3O" open banking model (open platform, open innovation and open collaboration) advocated by the CIO and EVP of WeBank shows a high correlation with the concept of "open innovation" model proposed by Chesbrough (2006). The following diagram illustrates the inside-out thinking of open innovation management model.

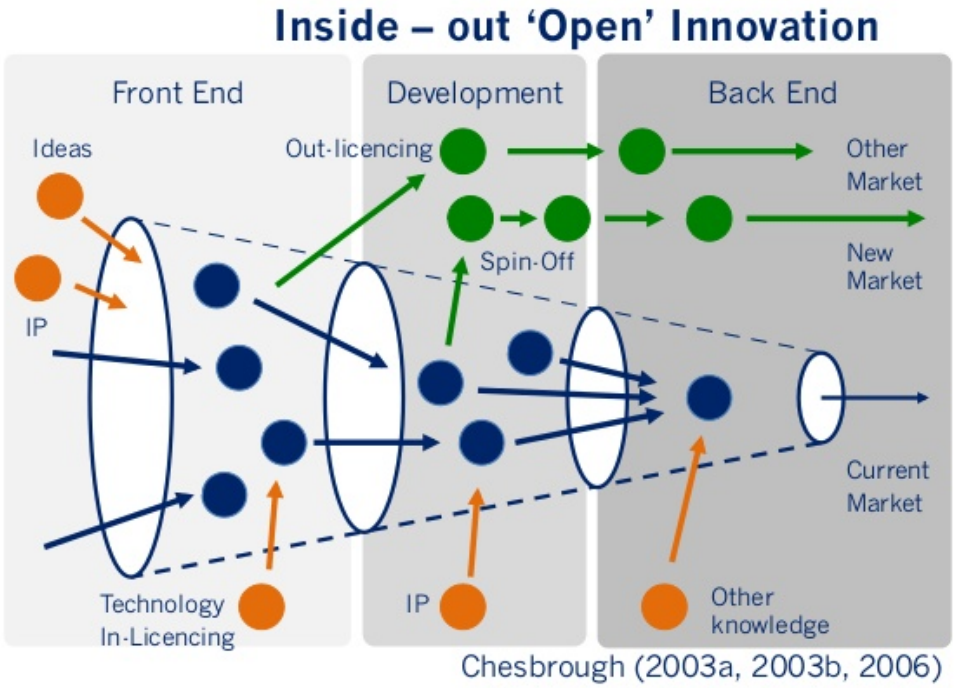

Figure 9-6: Chesbrough's Open Innovation Concept

In the open innovation model, WeBank acts as a connector between industry players and financial institutions. On the one hand, leveraging on Tencent's invested entities in social media, mapping services, gaming, entertainment, logistics, cloud and car rental services, WeBank helps study the financial services use cases in respective scenarios, helps extract, load and transform consumer, transaction and behavioral data into various user profiles and data models. Using its risk analytics modeling, WeBank generates risk profiling data for Tencent's platform users, so that matching financial products can push to the right users at the right time at minimum costs. On the other hand, WeBank also provides user profile and risk data modeled customer lists to financial institutions to help them reduce overall operation and marketing risks to low-net-worth customers.

WeBank leverages its resources in digital financial product design and development, big data analytics and FinTech technologies (ABCD) to effectively to lower its operation costs and promote inclusive financing through digital banking. The digital products are distributed to the target individuals and SMEs using Tencent's and its partners' distribution channels. The following diagram illustrates WeBank's collaborative innovation model. This model enables banks to embed their product and risk management as well as technological and financial service capabilities into specific scenarios and industries. In return, it will help banks approach target customers more effectively, enabling more inclusive and contextual financial services.

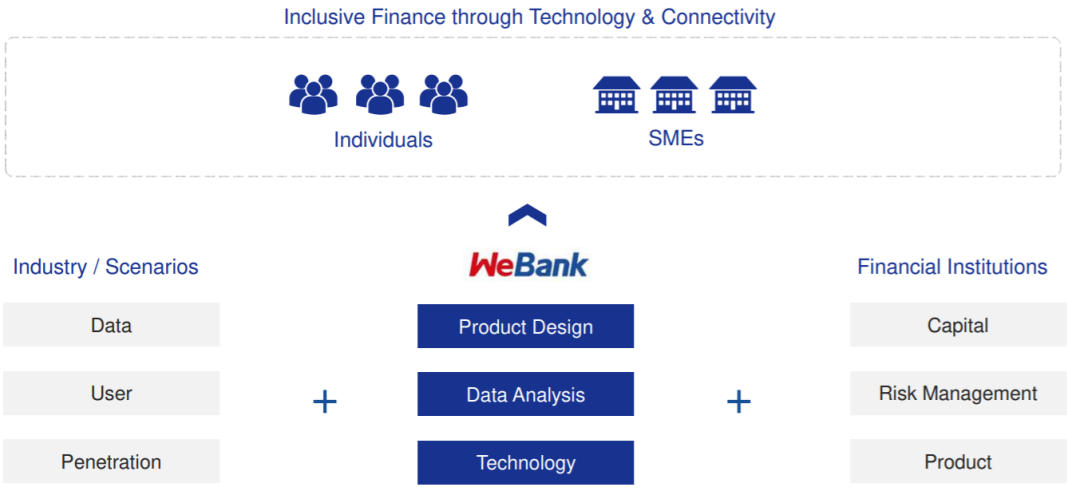

Figure 9-7: WeBank's Inclusive Finance Concept

Source: WeBank

On the product level, WeBank has adopted a micro innovation process for its product design and development. According to Yang *et al.* (2016), micro-innovation has a few characteristics that differentiates itself from incremental innovation. From a product and process innovation perspective, the products are first developed based on existing products and designs in the market. This is what is referred to as **adaptive development**. Second, the products undergo **repetitive development** and innovations which could add new features or simply improve the user interface. The changes are generally small but noticeable. But the **small changes are very frequent.** Each new version must be short to obtain feedback from users and improve products almost instantly. This makes users feel excited on each new release and using the product becomes so much fun. Third, while development is delivering what the users need, innovation is delivering features users will find useful. Therefore, for the development of the product, **user feedback is important for consideration constantly.** Depending on the analytics and statistics, **ideas of various new innovative features are sure to occur.** The

following diagram illustrates the micro-innovation process from a practitioner perspective.

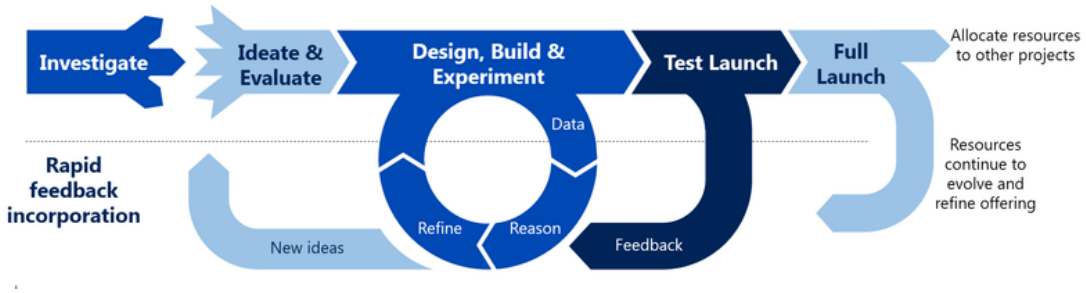

Figure 9-8: Micro-innovation Process

From the organizational framework perspective, WeBank divides the group of developers into **small groups for the development of specific features.** This division creates small but enthusiastic teams and the CIO is the head developer managing all these teams. Breaking norms, establishing procedures and making bold attempts have been the most notable feature of micro-innovation at WeBank. It could never be accomplished in a research center or on a factory assembly line. **Successful micro-innovation requires implementation by capable and vigorous small teams**. **Besides, cooperation among team members is kept simple to maintain members' initiatives and enthusiasm.** In addition, WeBank **allows every team the maximum freedom to innovate and remove all the constraints.** Most of the companies in the world impose constraints on their developers that hinder innovative thinking. Lastly, WeBank keeps a **constant watch on the important success factors. Such as the market demands, existing and upcoming competitions, compliance requirements and various regulations in different areas.** These factors are changing, and they need to keep the product grounded. While the innovation is constantly going on in the background, **continued integration and continued deployment** happen at the forefront with user feedforward.

What are the processes behind micro-innovation? Take WeBank's first financing product **Weilidai**" (micro-loan) as an example to review its micro-innovation process. Micro-loan is a consumer financing product targeting individual with characteristics of "unsecured, unguaranteed, daily interest calculation (0.02%-0.05%), flexible drawdown and settlement". Micro-loan adopts the user invitation system. Invited users can see the entrance of "Particle Loan" in the "QQ Wallet" of mobile QQ and "WeChat Wallet" of WeChat, and can get a maximum loan amount of 500 to 300,000 yuan. The entire loan application, approval and withdrawal process is 100% online in 40 seconds. Micro-loan allows borrowers to settle loans at any time and does not charge any other additional processing fees. As of May 2017, since the micro-credit was officially launched, the micro-loan had covered over 98 million people and accumulated to more than 360 billion yuan. Micro-loan withdrawal had covered the population

across 567 cities in 31 provinces and autonomous regions nationwide.

Micro-loan has gone through multiple stages of micro-innovation

Stage one: Creating product features to establish a user base

In 2015, when it was first launched, micro-loan was designed to provide small amounts of individual loans. The micro-loan idea was generated from employee survey at Tencent. The majority of the lower income groups were looking for some unsecured short-term loans to support their daily spending. They found it was difficult to get financing from traditional banks due to the lack of credit rating and records at banks, and no guarantees or mortgaged assets. Some of them started to borrow money from P2P lending platforms but the interest rate was extremely high. Based on the original concept and objectives to drive financial inclusion in China through private (and digital) banking, a small team was set up to put together a product for Proof of Concept (POC). The Minimum Viable Product (MVP) or Micro-loan 1.0 was launched on QQ platform in July 2015 and on WeChat platform in October 2015. The core feature of Micro-loan 1.0 enabled users to apply for short-term financing up to RMB 500 – RMB 2,500 based on individual credit rating developed by WeBank's credit modeling. Although it was released with good market responses, Micro-loan 1.0 started to suck up WeBank's capital and cashflows. It put WeBank in cash stress due to the lack of deposit business. Some users also complained that it was difficult to find the "apps on app store".

Stage 2: Expanding the platform economy model

To resolve the funding/deposit lacking issues of micro-loan, WeBank started to partner with traditional banks to co-fund the lending. In this model, WeBank provides customer profiling, distribution channel, risk assessment, drawdown & settlement processing services to partner banks. The funding was co-provided by WeBank and its partner banks (2:8). WeBank collects platform servicing fees from partner banks based on the amount of loan on an agreed percentage (3:7). The credit default risks are assumed by both parties based on the funding ratio. Based on this model, WeBank successfully reduced its capital commitment and liquidity requirements, while increasing its return on capital rate. This reflects the "platform economy" realization in the mobile Internet age. As of the end of 2018, micro-loan had established a joint loan business partnership with 25 financial institutions that shared revenue and risk. Most ideas for micro-innovation originated from the lower levels of the company, a flat structure could facilitate information flow. The idea of "Tech-Bank" collaboration was based on exceptional feedback and input from the business partners and eventually a fully functional regional Fintech

partnerships department was formed in 2018. WeBank has always kept users/industry pain points in mind in the process of micro-innovation. The small but useful features that WeBank added enabled the micro-loan product to quickly establish a foothold in the market.

Stage 3: Credit risk modeling automation

Micro-loan's customer selection is based on multi-dimensional user data real-time analytics. By studying the customer behavior and financial performance in the social interaction data, WeBank fist analyzes and categorizes the users into several segments based the person's social networks, financial transactions network, society characteristics, location footprints, education background, earning, home location and areas of interests to determine the credit risks. WeBank will provide the white/target customer list to the partner banks to further validate the credit standing of these persons using the banking's credit rating and online verification systems. In addition, the micro-loan team also developed six credit risk models to conduct real-time online fraud identification, risk/prepayment scoring and loan performance/repayment monitoring. The six credit risk models include public security data model and PBOC credit data model, WeChat and mobile QQ social interaction modeling, and WeChat Pay financial model. Leveraging on Tencent's big data collection, modeling and analyzing capabilities, WeBank is able to more accurately predict the customer repayment capability and financial stability, reduce credit default rates, and most importantly, prevent frauds. All the customers' credit risk modeling and profiling are continuously updated and revised all the time 24 x 7 automatically, making it the most efficient credit vetting system compared to the employment, financial and asset-based human judgmental/scoring snapshot credit assessment in traditional banks.

The ideation, design, development, testing and deployment process of micro-loan follows Tencent's application development methodology which is basically the SPRINT method. On top of the regular application development controls, the mobile-based financial products also need to comply with the risk and compliance standards set forth by CBIRC and the internal finance, risk, legal and compliance departments at WeBank. In addition, WeBank's product team also needs to collaborate with Tencent's QQ and WeChat platforms for user profile, analytics and data modeling. Its collaboration with QQ and WeChat also needs to determine the financial product deployment process, landing, application and data connectivity.

There are a few salient points worth pointing out in the micro-loan product development process.

(1) Be the first to market

Rather than follow the traditional product development sequential process (certain steps

need to be completed before other stages can begin), WeBank speeds things up by simultaneously working on many parts of the product in order to reduce the time-to-market. For example, to develop the micro-loan product, the team included every function necessary for the entire product lifecycle (from host, launch, to service), allowed WeBank to coordinate the critical product decisions (user interface, programming, building IT infrastructure) simultaneously with QQ and WeChat teams to deliver the final product much faster. The product was completed in 2.5 months, while the global standard is over six months. Through its accelerated innovation processes, Tencent can support its business model of being more nimble, agile, flexible, and responsive to create new products and services categories that will win over Chinese consumers.

(2) Quickly introduce products that fit consumers' needs to gain market share

Rather than the traditional time-consuming "beta testing" processes, rapid "launch-test-improve" cycles are core to WeBank's innovation process. WeBank's development team regularly launches new features with small enhancements directly into the market and gathers user feedback. And its development teams can rapidly incorporate new user-generated ideas and needs into the product. For example, when micro-loan was first launched, it only targeted QQ and WeChat users for small loans applications. WeBank received many requests from the users to provide guarantee to loans requests from their friends. However, it is difficult to appoint/accept guarantor in the virtual world although real name/person verification is mandatory in WeChat now. It is not formally recognized in China's laws yet. Later on, WeBank released a new version within weeks with features allowing WeBank to develop pre-approved credit limit with white listed users, and then push the "invitation/credit line notification" to targeted users on QQ and WeChat platforms. This helped WeBank control the credit expansion on micro-loan and continue to learn and enhance its consumer financing credit risk modeling over times. By incorporating user requests into the product design process, WeBank can rapidly produce products that meet users' needs, increasing product adoption and market share. In addition, by directly relying on customer feedback, this greatly reduces the costs of conducting market research and building prototypes.

As a digital bank, WeBank has the capability to introduce products to the market quickly. The bank's best time-to-market record was 11 days. "*It only took 11 days for a new product to evolve from its ideation stage to actual delivery to the market. That happened in 2017 and the record is very hard to beat. We talked a lot to the industry players, and they told me it would probably take them more than 11 days to gather their people and hold a meeting to talk about a new product,*" said the Product Manager. By using **accelerated innovation processes,**

WeBank developed its competitive advantage by being a "fast follower" (not necessarily a technological pioneer) who can quickly deliver new products to the mass market at high volumes and affordable prices. He added that more than 50% of WeBank's employees are software engineers and data scientists and the company utilizes ABCD technologies to increase work efficiency and keep costs low.

For instance, WeBank leverages **facial recognition technology (part of AI technology) to conduct its KYC process. This eliminates the need for WeBank to open physical branches to onboard customers.** "*We have scanned tens of millions of faces over the years and have achieved a very high accuracy rate. In fact, the false recognition rate (used to measure the error caused by the facial recognition technology) is less than one in a million. In comparison, the rate of error of the human eyesight is 0.8%. Machines are already doing a much better job than humans when it comes to facial recognition,*" said the Senior Researcher of WeBank's AI department. WeBank also utilizes **blockchain technology by running a shared ledger with its partner banks so that all transactions that run between them are communicated in real time**. "*Transactions that happen in WeBank are completely recorded digitally. We do not have paper contracts,*" said the Senior Blockchain Architect. When disputes are brought up by customers, there are arbitration agencies available in China to solve them by collecting electronic evidence from WeBank's blockchain, explained by the legal and compliance officer.

WeBank runs its software programs on cloud, which cuts costs substantially. It also **uses big data to conduct market research and build risk-management models for its financing product,** the Senior Technology Manager added. "*We have been processing hundreds of thousands of parameters and building a few hundred models to assess the credit profile of our customers.*"

In summary, the open banking model and micro-innovation process are the core innovation model of WeBank which are very relevant and well aligned with its operational model and organizational trajectory.

9.4.2 Regulatory Dialectics Reconciliation

From a regulatory perspective, WeBank is driving financial inclusion at scale in China to support state policy, a key innovation driver mandated by the Chinese Government on technology company. In China, the traditional banking system has historically underserved or

even excluded millions of consumers and SMEs that are considered low-net-worth customer segments. Although China is the world's second-largest economy and has four of the five largest banks in terms of assets, it still has the world's largest unbanked population: 225 million Chinese adults currently lack a bank account. SMEs also find it difficult to get access to financing, which forces them to turn to shadow banks or alternative sources of funding. "*80.2% of adults in China have a basic bank account while 61% have used mobile payments. Only 9% of Chinese could secure funding from financial institutions in 2017. Many have to turn to their friends and family to borrow money, while others even lack funds for emergencies*", said the CIO. To successfully drive financial inclusion at scale, banks need to evolve their business model and embrace digital technologies to provide simple and more personalized solutions that meet customers' financial needs at an affordable cost; reach more customers at a lower cost; and continue exploring alternative data sources and develop innovative underwriting and credit profiling techniques. These are the areas driving innovation at WeBank.

However, regulatory compliance is still a baseline for all FinTech players. In 2019, WeBank was fined two million yuan (USD 281,710) by China's national banking regulators for violations that included irregular loan issuance, noncompliance in management appointments, and employee misconduct. This was the largest fine issued by CBIRC in 2019 to private banks. The Chinese government has been providing policy incentives to large IT firms to innovate and grow in financial service sector which is traditionally dominated by state banks. However, systemic risk has increased by not imposing strict and comprehensive regulatory regimes on these online banking firms.

The business models applied by WeBank, MYbank and traditional banks vary tremendously. WeBank uses technology to link the smallest entrepreneurs with banks, and claims that it does not compete with banks, but rather as a connector or brokerage. WeBank claims that it uses its balance sheet to finance about 20% of the loans and syndicates the remaining 80% to local banks that do not possess the online capabilities to find this type of clients. MYbank also describes itself as a wealth manager. MYbank relies more on leveraging local capital markets, which inevitably involves competing with banks for deposits. Lending is partly funded by borrowing from the asset-backed securities market, where it has become China's largest issuer.

However, a lobbying battle ensued between banks and online lenders. China's traditional banks complain that online banks destabilize and suck away their deposit base. Now they must pay higher interest rates and reduce customer services by shutting down branches and ATM machines. In response, Chinese authorities have tried to limit and regulate WeBank's reach, but

the actions are more *ad hoc* rather than cohesive policies like preventing WeBank's system from being used by institutions to market loans. Regulators have issued rules requiring large MMFs to significantly reduce holdings of risky assets that allow them to pay high interest rates. Chinese authorities have been contemplating controlling these activities by imposing strict capital controls and deposit taking restrictions on digital banks that are similar to those imposed on traditional banks.

What are the most important regulation changes that affect the innovation at WeBank? First, digital banking must strictly abide by the "Commercial Banking Law", the "Regulation of Financial Enterprises", and other relevant legal requirements issued by CBIRC. For example, no credit loans shall be issued to related persons. The proportion of internal employees and natural persons holding stocks in the digital bank should not exceed 20%, to avoid the dominance of a single party leading to the risks brought by profit-seeking. As to WeBank, Tencent currently holds 30% of its shares as its largest shareholder. Despite the stable shareholding structure, WeBank needs to avoid the influence from Tencent to issue unsecured loans to related parties or companies. Second, China's laws have emphasized the protection of personal privacy in recent years. WeBank captures consumer spending through big data analysis, hobbies, lifestyle habits and social information to establish a credit model and carry out credit rating. But during this process, it also captures and applies personal identifiable information from Tencent's platform for its own benefits. Under the new regulations, WeBank may have a legal risk of infringing on consumer privacy. Third, WeBank provides financial services to low-net-worth individuals and SMEs. Regulators require banks to monitor the usage of these loans according to their intended purposes. If the loans issued by WeBank is used in improper high-risk and high-yield products (such as speculating in stock markets or real estates), not only are the users likely to face loss, the NPL of bank will also increase. Unfortunately, WeBank does not have a mechanism to track the usage and flows of these loans very clearly. In response to the above, WeBank has enforced strict governance on the product design and diffusion process, enhanced segregation of risk and responsibility between WeBank and its partners, and improved protection of individual data. For example, auto-loan is a product developed through cooperation with a secondhand online car dealer to provide exclusive loans to car purchasers based on consumer data obtained from third-party platforms and the banking system, moderated by its consumer financing credit model, and co-funded with partner banks.

How does WeBank take note of and respond to the new regulation announcement? Like most banks, WeBank's legal and compliance team has regular formal and informal communication with the regulator. They are often invited to share new technologies, new

innovations, new trends in online banking. They are asked to join discussions or provide commentary on new regulations before formal release. This provides a forum for WeBank to understand the regulation trend, focus and development. Any early awareness of regulation trend and emphasis can help WeBank preempt regulatory requirements and concerns in financial innovations. WeBank also has access to new regulations announcement from PCOB website and CBRIRC circulars. Product Manager needs to be aware of and sensitive to the regulatory development respective product segment. Other informal information channels include news, discussions and articles issued by professional bodies and regulations in their respective WeChat official accounts.

9.4.3 Financial Innovation Management

How good is WeBank in managing its innovation process? In term of organizational change management, when it was established in 2014, WeBank was divided into five Business Groups (BGs) – Corporate Interbank Financial BG, Small and Micro BG, Credit Card BG, FinTech BG and Micro-Finance BG. In less than a year, it consolidated the Corporate Interbank Financial BG and Small and Micro BG into the Platform Finance BG which focused on helping traditional banks provide financing to those unbanked or low-net-worth groups through its distribution channel. WeBank also dismissed the Credit Card BG and set up two new BGs, namely, Wealth Management BG and Consumer Finance BG. In fact, credit card business needed to rely on distribution network which normally sits with traditional banks.

According to CBIRC regulations, all new credit card customers were required to be verified in person. The facial recognition technology was not that mature in 2015. WeBank was required to cooperate with traditional banks to run the credit card business which it needed to share some profits. It was the same for deposit accounts. Besides, wealth management and consumer finance products were very popular among unbanked individuals and easy to distribute over Tencent's QQ and WeChat platforms. In short, **WeBank was very quick and effective in adjusting its governance structure to support its business innovation and process. After the BG adjustment, the business logics of WeBank became clear and well aligned with its strength as a "social media platform financial player".**

In terms of product innovation management, WeBank focused on consumer finance, wealth management and platform finance which were offered to individuals and SMEs online. For example, in 2015, WeBank launched micro-loan which was for retail customers and adopted

the white list system. By the end of 2019, the micro loan users had reached one million. But they were still in the white list system, not fully opened. The amount of outstanding loans was two billion yuan, and the cumulative lending was four billion yuan. In 2017, WeBank launched its wealth management app. But compared with MYbank's "AnJubao", WeBank's app was not in the way of a financial supermarket, but attempted to provide only one-two products in different periods and at different yields. In 2018, WeBank further launched "micro-car loan" through its partnership with "Youxin second-hand car platform". The platform finance concept of WeBank was to provide basic products and embed application scenarios. **Based on the above examples, WeBank has a clear product development roadmap, innovation pipeline and strategic partnership program to support its business strategies, and aligns well with its what, when and how of product innovation.**

At the time when **WeBank was carefully positioning and adjusting its business framework and launching products one by one,** MYbank did not seem to consider too much. One thing MYbank focused on was to migrate Ant micro-loan to its platform. MYbank offered nine billion yuan loan to Taobao Tmall merchants during "Double 11" purchase festival and provided rural farmers with unsecured micro-loans. This was an inherent advantage of Alibaba-backed MYbank. "*Due to limited deposit (liability) business, digital banks were focusing on expanding their lending (asset) business through collaboration with the traditional banking system. The key reasons why WeBank has not exerted a lot of force on the asset side are****: First, the accumulation of risk control capabilities is insufficient, and the current traditional banks have bad debts. Therefore, the expanding of asset business must be cautious; second, there is a lack of capital support. The entire system on the asset side business must be re-established through the platform finance,****"* said an industry analyst. As result, WeBank re-innovated its business model and adopted a joint lending model with partner banks. WeBank was responsible for obtaining customers at the mobile Internet front and charging service fees. Partner banks was providing capital flows to the needed persons through WeBank's distribution channel and customer profile credit modeling system.

How did WeBank evaluate its innovation performance? The key performance criteria are purely quantitative oriented. First, the increase of **registered and active users for each app on WeBank's platform** is measured individually and collectively on a monthly basis. The number of registered users indicates the product popularity, while the number of active users indicates the product's actual usage situation. Second, **the total amount of loans or financing drawdown and repayment** are also measured to indicate the actual amount and timing of the assets. The amounts indicate the health and quality of assets for each product. The amount and

outstanding dates of late payments are also measured and compared to the outstanding assets. The indication of NPL is a good indicator to the credit model. Additional user attributes are evaluated and added into the credit model to enrich the prediction and prevention of NPL from its financial innovation. Third, **the number of partners and type of innovation developed from the partnership programs** are also measured to evaluate the success of its "3O" open banking model (open platform, open innovation and open collaboration). The more open banking partners are, the more enriched the open banking platform is in terms of innovation participation, service connection and product collaboration. Forth, the **amount of funding generated from partner banks** is measured to monitor the credit risk exposure to WeBank. It is liable to the collection, interest calculation and settlement of loans issued from its platform. Although currently it still maintains a low NPL ratio of around 1%, the hard measures or forces it used to collect outstanding loans has aroused concerns from the public and social media. Fifth, **the costs to acquire a new customer** are measured too. The new customer generation costs include customer data collection, modeling and storage costs, and target customer touch point and conversion costs. These costs are closely monitored to indicate the cost of each new customer. In the Internet economy theory, the larger the platform, the lower the new customer acquisition cost. Finally, the **revenue and profitability of each product** are collected to indicate the performance of each BG. The bonus and performance of each BG are largely determined by the profitability of product(s) in the BG.

How did WeBank develop its innovation competency in FinTech? "*At WeBank, we are staunch believers of **Open Innovation** and strong supporters of **Open Collaboration**. We believe opening up technology is key to furthering technology enablement and driving business collaboration. We share our core technologies and business solutions with our partners through APIs and SDKs to help co-build a **Collaborative Business ecosystem (Open Platform)** for our business partners,*" answered the CIO and EVP.

In term of Open Platform, WeBank believes that the digital banking industry needs to go beyond API banking by sharing data models, algorithms, customer onboarding procedures, risk management and other capabilities with participants in the collaborative business ecosystem. Financial services can be provided by such players as retailers, non-financial service companies, FinTech companies and software companies, by using APIs, SDKs and H5 provided by Open Banks like WeBank, to enable scenario-based financial innovation. For example, WeBank's auto-loan and smart retail financial innovation product is developed based on a platform model for business partners connected through open APIs, SDKs or H5. Take API Banking for example. In API Banking, a bank offers banking services through APIs, SDKs or H5 on the

open platform, where business partners could connect to the financial services. The bank, in turn, can extend its services into more scenarios with the help of partners to provide better services and enrich choices of products for users. Through the collaborative learning experience, WeBank can work together with partners and connect different service providers into a larger ecosystem, a platform economy model, to meet the inclusive financial needs at lower costs but higher speed through micro and distributed innovation learning process.

In the Open Innovation space, innovations are initiated by financial institutions and FinTech companies allow collaborative business partners to leverage external technology advancements. This include providing open source software, intellectual property licensing, and reference implementations to encourage and empower partnerships and enable technology community innovation. For example, FISCO was co-founded by WeBank and other financial agencies and technical companies, and its product FISCO BCOS developed by the open source work team of FISCO is a good reference for open innovation output. Through the continuous efforts toward promoting open source and developing its community, FISCO BCOS has become an ecosystem with hundreds of implementations and thousands of members and developers that have linked the companies with different industries.

A lot of applications have emerged in different business areas such as payment, ledger reconciliation, settlement and clearing, securitization, supply chain finance, credit checking and OTC market in the financial industry, as well as areas outside financial industry such as digit escrow, cultural copyright, recreational games, social management and governmental service. In short, open innovation bestows innovation abilities on partners with open SDKs, IP empowerment and FinTech reference implementations, lowering the entry cost of collaboration and enabling further advancement and innovations on technologies. Through open innovation, WeBank can access, combine and reframe various technologies and use cases into meaningful user journey and application scenarios. The collective learning process inspires internal innovation ideation and development.

For Open Collaboration, the distributed business models shift the landscape of futuristic commerce, where collaborative business partners will become more sophisticated in vertical markets. Open collaboration will drive the construction of shared business infrastructure, which nurtures more collaborative business models, to enable collaborative business innovation. For example, WeBank shares its latest advancements in financial technologies and reference implementations with its partners to build the foundation of the Collaborative Business. This in turn helps establish a global network of businesses which may jointly create new and distributed business models as part of the new open banking era.

The open innovation journey at WeBank consists of five stages.

Stage 1: Exploration

WeBank's technical solutions and business applications present a multi-dimensional view of its FinTech capabilities. These capabilities may be experienced via the reference implementations built in its FinTech Sandbox.

Stage 2: Application

To join WeBank's partnership network, the firm or person shall email their interest along with relevant information (such as name, job title, company name, industry and contacts) to FinTech@WeBank.com. WeBank's FinTech specialists will contact the interested party to guide them through the partnership application process.

Stage 3: Validation

Once the partnership application is processed, further information might be requested. A mutual non-disclosure agreement is then signed.

Stage 4: Agreement

A memorandum of understanding is signed that defines the scope and nature of the collaboration between parties.

Stage 5: Collaboration

Upon signing the partnership agreement, various workshops, technology sharing sessions, and trainings will be arranged by WeBank to the technology partners. Technology partners may typically offer system integration and solution development services to WeBank's strategic business partners based on WeBank technologies. They may also provide WeBank with on-going support and maintenance services to keep up with the technology upgrades and new releases of its FinTech solutions.

In addition to the above, WeBank also established a digital banking laboratory to **capitalize on the advantage of ABCD technologies to advocate finance inclusion.** A stands for Artificial Intelligence (AI), which mainly focuses on replacing manual work and automate anti-fraud. Examples of AI in open banking include eKYC and Chatbot. B refers to Blockchain which focuses on distributed ledger, evidence-preservation and smart contract. An example of blockchain application is auto-reconciliation. C is Cloud Computing, which refers to capability for over-the-cloud scalability and cost control. An example application in cloud computing is

API/SDK-enabled services. Finally, D means Big Data, which refers to using data for effective risk management and precision marketing. A great example of big data usage at WeBank is data-driven risk modeling.

Other innovation and competence development platforms at WeBank include **WeBank MeetUp and GitHub,** both of which are open community platforms for organizing regular meetups and providing developers with access to its open source stacks. Finally, in order to cultivate university talents and promote the long-term development and continuous innovation of FinTech, **WeBank also organizes "FinTechathon",** a FinTech hackathon targeted at university students. The competition, open to global universities, is designed to screen projects in AI and blockchain areas. Selected teams will receive bumper bonuses, internship opportunities and employment offers.

In 2019, Tencent Cloud and WeBank announced the establishment of the "**Tencent Cloud–WeBank Fintech Innovation Lab"**. The lab is based upon the "development concept" of open banking and engages in joint research and technological innovation in the areas of basic frameworks, financial applications and experiential innovation. It will help drive the development of financial inclusion. Both parties will explore the in-depth application of distributed computing, distributed data-bases, quantum communications and intelligent operating systems to banking technology frameworks, as well as jointly explore the implementation of FinTech applications that satisfy various open banking scenarios, including smart risk control, financial security and blockchain.

Can you imagine a digital-only bank that has served 100 million customers within four years since its establishment? Not to mention that those 100 million customers were all un-/underserved by traditional banks. WeBank has achieved this goal and has become one of the largest digital banks in the world. According to the CIO, the secret sauces of WeBank are the tech-driven innovations powered by AI and its differentiation across five digital dimensions: strategy, culture, talent, organization structure, and technology. Here are some brief explanations of innovation facilitator at WeBank.

Strategy: WeBank developed a disruptive credit profiling system to drive inclusive finance. It has adopted an ambitious strategy focused on inclusion, data-driven insights, and collaboration.

Culture: WeBank builds and sustains an innovative culture. Right from the start, the digital bank encouraged customers to take measured risks, learn from failure and foster a diversified, equal, and collaborative culture.

Talent: WeBank nurtures internal and external talents to foster innovation. WeBank pays attention to its internal employee career and skill development by providing personalized training programs. It has also partnered with global universities to foster its people.

Organization structure: WeBank organizes for agility. WeBank has enabled an agile organization matrix that avoids redundant and complex management layers. It also focuses on cross-functional and even cross-organizational teamwork, which enables a fast test-and-learn product development cycle.

Technology: WeBank embraces emerging technologies to build agility and scalability. WeBank combines a multitude of modern technologies to provide the foundation for a forward-looking banking platform architecture that includes the cloud, open technologies, open source databases, and powerful embedded analytics and AI.

"*Besides embracing FinTech, WeBank's technical team has created* ***an "agile governance structure" based on decentralized operations with coordinated controls.*** *In addition, WeBank also nurtures a* ***culture of trial-and-error with low cost, encouraging bottom-up innovation and empowerment of individual employees****,*" said the Senior Technology Manager.

How WeBank approached FinTech might inspire its partner banks and lead to a more radical digital transformation in the banking industry? For example, WeBank has partnered with Digital Asser to launch the first blockchain solutions in China for the financial market. FISCO BCOS, the open source smart contract language created by Digital Asset with the blockchain platform, has attracted over 10,000 individual developers, and over 500 corporate members globally. Instead of a single blockchain, the consortium chain is a set of blockchain applications to serve the public. The protocol is coinless, permissioned and supports Zero-Knowledge Proofs, allowing users to reveal information without sharing private data. It is one of the first blockchain platforms built specifically to meet the regulatory requirements and service demands of the financial services industry. In 2019, FISCO BCOS became the first domestic blockchain platform selected as the technology infrastructure for China's national blockchain-based service network (BSN). The following diagram explains WeBank's collaborative network approach in FinTech.

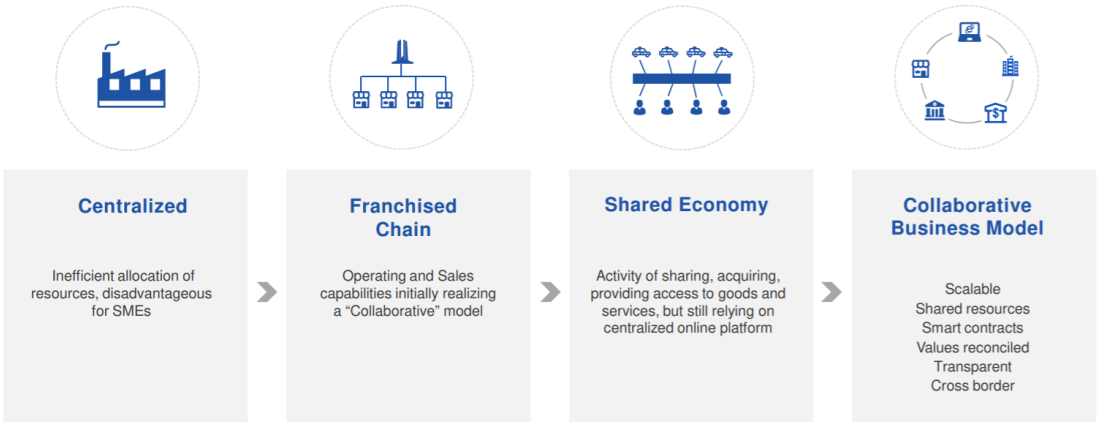

Figure 9-9: WeBank's Collaborative Network Approach

Source: WeBank website

However, the **lack of public deposit business, the absence of physical branch, the shortage of experience in banking credit and operational risks management, and the potential conflicts between Internet and banking business DNA were restricting innovation activities at WeBank.** Let us take WeBank's "micro-loan" and "smart deposit+" as two examples to explain these constraining factors.

Micro-loan refers to "small flexible loan" targeting personal consumption financed by taking the advantage of user traffic from Tencent's QQ and WeChat platforms. It became popular very rapidly, profitable and expanded quickly through friend's referral. However, there were hidden risks or constraints with this financial innovation product. WeBank did not have a strong public deposit business due to the lack of physical branch to absorb public deposit and generally people still believe in the traditional banking system when dealing with deposit and enterprise banking. WeBank's capital adequacy ratio became very low soon after the launch of micro-loan innovation which began to restrict its expansion. As a result, WeBank was highly dependent on interbank borrowing to sustain its liquidity and its lending costs increased rapidly.

To solve its deposit issue, WeBank launched "smart deposit +" product in September 2018. According to an industry analyst, there were three main reasons why "smart deposit +" was so popular at that time due to limited investment options/channels in the market. First, the real estate market was stable (low incentives to invest in property market) and the stock market was sluggish in 2018. Second, the State was in the process of scrutinizing illegal fund-raising, P2P and other high-risk and high-yield assets. Third, high interest rates offered by the "smart deposit +" product, with its flexible access and high-income characteristics, quickly won the attention and welcome from the public. However, the good time was not long. After just four months, it

was announced decommissioned in December 2018. The regulator ordered the removal of the product from its platform and replaced it with a lower income product.

The regulators considered two risk factors in this case. First, huge deposits generated in a short period of time also meant that it could easily induce liquidity risks in the financial market. Second, high interest rates offered by online financial products could disrupt the interest market. Although the "smart deposit +" product was relaunched in early 2019, the interest rate dropped dramatically and there was no flexibility to withdraw anytime. In short, unlike MYbank, WeBank did not have access to the user business scenario, lacking operational and transactional data of the borrowers. This forced WeBank to use WeChat's online sales platform data, seek collaboration with third-party e-commerce platforms to access to user data, and cooperate with traditional banks for capital and liquidity. WeBank also headhunted bank managers from traditional banks (mostly from Ping An's retail banking) to lead its online banking operation. However, according to the HR manager, the result was not good as most banking officers left after a year due to cultural differences.

9.5 Summary: An Open Banking and Micro-innovation Model

In summary, based on the above analysis, it seems that WeBank adopted an open innovation model at the enterprise level, and a micro or lean innovation process at the product level.

The "3O" open banking model (open platform, open innovation and open collaboration) which entails the use of open source technologies to foster exchange of ideas, data and knowledge internally and externally aligns well with the notion of open innovation. Based on the open innovation concept, the firm can commercialize internal ideas through channels outside its current businesses in order to generate value for the organization. Besides, ideas can also originate outside the firm's own labs and be brought inside for commercialization. In other words, the boundary between a firm and its surrounding environment is more porous, enabling innovation to move easily across the organization boundary. For example, WeBank's micro-loans are co-developed with its partner banks by studying the financing needs and behaviors of low-net-worth individuals or SMEs based on user data collected internally from Tencent and partner banks. The financial innovation product is then co-funded by partner banks and WeBank and marketed through WeChat and QQ social interaction platforms. For platform finance, WeBank considers the specific consumption scenarios and customer demand characteristics of the partner IT platform, calculates risk models, develops customized loan products, and embeds

them into the partner IT platform. Customers of the platform can submit loan applications through the platform software portal.

At the product level, WeBank adopts a micro or lean innovation management model to support its rapid and disruptive idea generation and trial-and-error activities. Inspired by design thinking and agile development concepts, lean innovation management is a framework to manage innovation projects in a more agile way than traditional project management. For example, instead of asking managers to develop a full business case with lifetime costs and risks to ask for budget for a full project (which is often highly inaccurate and purely guesswork for innovation projects), a WeBank employee might only be required to ask for budget to do an initial set of experiments to test the market for an idea. This can lead to a much larger number of innovations being tested much more quickly, at a a lower cost and a lower risk than traditional management methods. According to the interviews, lean innovation management at WeBank helps promote lots of small-scale and cheap experiments instead of full launches; allocate small initial budgets to get to the next stage in a lifecycle early on (such as testing the market), instead of asking for a full project budget with a business case; incorporate feedback from multiple parties throughout the design and development process; build MVPs and prototypes and test these with real people; and iterate and change direction ("pivoting") if the feedback suggests that WeBank has gone in the wrong direction.

Besides optimizing the backend operations such as credit risk management, legal, compliance and core ABCD technologies, WeBank also focuses on marketplace disruption. In a competitive and user-centric FinTech economy, creating disruptive and popular application not only requires accepting an added level of risk, but it also represents an opportunity for widespread success. This is where micro-innovations come into play. WeBank encourages its employees to constantly innovate and try new digital tactics and developmental approaches. They may fail a few times, but they are more likely to develop sustainable successes over time that competitors may never mirror. One of the problems in traditional banks' innovation model is the silo effect – isolated external partners and data management, isolated IT product design and development, and isolated sales and customer service in the innovation process. They each develop independent goals and ways to measure success, but their individual actions may not help the bank. Without collaboration, employees may never truly understand the customer or the total customer experience—two vital areas in business innovation.

"At WeBank, things operate quite differently. The bank's organizational structure, business culture, performance measurement and incentive schemes are designed to facilitate interdepartmental collaboration and open sharing of new and creative ideas, encourage

employees to experiment changes and take on more responsibilities, promote collaboration with partners, go to fieldwork and listen to the voice of customers, participate in open-door development meetings, speak up their concerns and support action-oriented employees in their pursuit of change," said the Senior Technology Manager. In short, micro-innovation is a scalable approach to innovation that encourages new technologies and processes without putting all the research and development eggs in one basket. This is suitable in the domain of fast changing FinTech innovation. Multiple, fast and interactive small improvements for potential smaller and practical ideas with disastrous results shall overweight a lengthy and heavy investment innovation process.

In summary, WeBank adopts an open innovation model at the enterprise level and a micro or lean innovation model at the product level. Both models align well with its open banking business model and synchronize coherently with its "3O" (open platform, open innovation and open collaboration) strategic initiatives. An "open and micro innovation approach" is suggested as the way by which financial innovation and regulatory compliance are reconciled at WeBank. Fifth, a further analysis shows that an open and micro innovation approach which is externally integrated and internally corelated best supports WeBank's proposition as an "open digital bank".

Chapter 10: Du Xiaoman & aiBank Case Study

The discussion of Baidu Finance shall begin with Baidu itself. Founded in 2001, Baidu is China's largest search engine and it built its user base through its ability to parse and rank Chinese characters and operates offline. This, together with, strong government support, helps **Baidu attract over 70% of web and mobile searches in China. Over 80% of its revenue is generated from online marketing** and the remaining is mainly from video streaming membership fees (iQiYi) and cloud storage (BaiduCloud). **Being the largest search engine in China, Baidu has 660 million active users, 14 major apps, and more than 100 million daily active searches.** Baidu also invests heavily in AI. For example, it launched Apollo program in developing AI-based software to enable autonomous driving in China, and the "XiaoYu ChatBot", which is a speech recognition program, to support insurance distribution and smart home. Baidu Map is also one of the most popular mapping services in China serving 600 million users daily.

To diversify its revenue source, in 2013, Baidu launched its FinTech business and obtained a third-party payment license. Two years later, Baidu integrated existing financial services (Baidu Wallets, Baidu Wealth Management and Baidu CaiFu) to form the Financial Strategic Business Group. **Baidu CaiFu of Baidu Fortune was launched in 2013 as Baidu's financial service aggregator. It focuses on offering online auto and travel insurance services. However, it was decommissioned in 2015 (after two years) due to poor conversion rates and the lack of opportunity to optimize display advertising from insurers.** The free promotion on Baidu search engine did not create a sufficient base of subscribers. As a result, insurers were not willing to pay the online advertisement fees.

Baidu's Financial Strategic Business Group continued to struggle in the competition with financial services offered by Alibaba and Tencent. Poor financial performance, increasing NPLs, poor product conversion rate, high turnover and lack of financial expertise continued to pull back Baidu's financial results. A few years later, **in April 2018, Baidu announced to spin off its financial business and launched a new brand "Du Xiaoman Financial" as an independent entity to isolate its financial impacts from Baidu** and raise additional capital to continue its operations. The name "Du Xiaoman" means "from Baidu, so small that it cannot stop moving forward." After the spin-off, the new entity raised USD 1.9 billion from TPG, Carlyle Group, ABC and Taikang Life Insurance to increase investment in AI, FinTech and open platform technologies. Baidu retained 38% stake while TPG, as the second largest shareholder,

held 26% shares.

The following diagram shows the business segments of Baidu Finance.

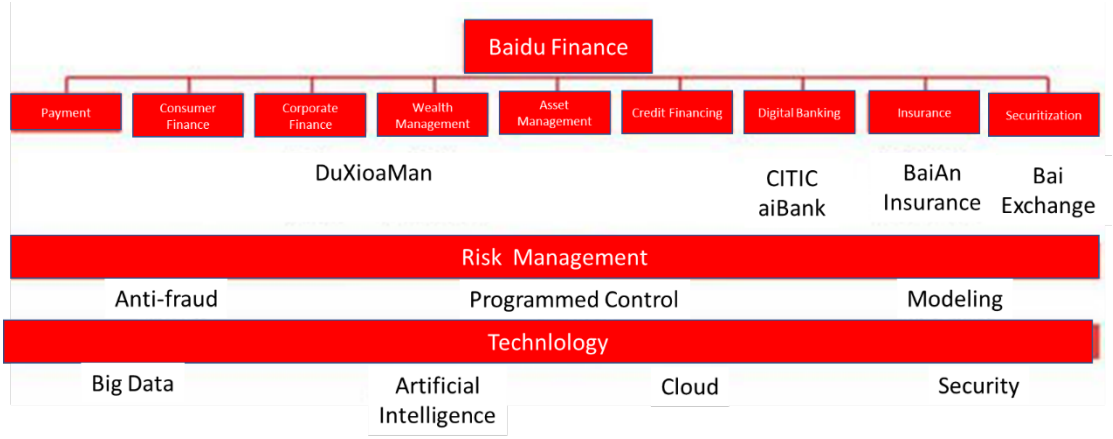

Figure 10-1: Baidu Finance

Du Xiaoman's business structure mainly includes consumer finance, third-party payment, online wealth management, insurance and securities, basically covering all areas of financial services. With the overall strategic goal of "establishing a financial service platform and building a FinTech ecosystem", Du Xiaoman aims to build a closed loop of consumer finance and wealth management ecosystem. On the asset side, its "Money to spend" app provides personal consumer credit services to the public. It uses Baidu's AI and big data risk control technology to bring online credit services to its users through easy application, fast approval, large amount, fast drawdown, and strong security. It offers different types of micro-loan financing for daily consumption, medical beauty, education, house renting and housing credit. The Baidu credit system can accurately match the borrowers' financing needs to provide "just-in-time" financing services when they need it. On the liability side, Du Xiaoman's wealth management app provides diversified products such as bank deposits, public/mutual funds, security brokerage, asset management plans, and insurance. Thanks to its third-party payment license, Du Xiaoman is integrated into Baidu and its partners' app such as Baidu mobile phone Baidu, Baidu Map, Baidu Nuomi, iQiyi, Ctrip and other external partners, to build a complete closed loop financial ecosystem. Besides, Du Xiaoman also cooperates with traditional banks to enhance its capital adequacy ratio and allocation process. For example, in 2018, Bank of Tianjin agreed to provide RMB 20 billion credit line support to Du Xiaoman, of which RMB ten billion was expected to be used for consumer finance such as education instalments.

Du Xiaoman's first financial product, **Baidu Wallet, was originally launched as an alternative to Alipay and WeChat Pay. However, Baidu Wallet was struggling to match its user base to attract offline merchants.** Instead, it partnered with ABC and Taikang Life

Insurance to offer insurance and micro-loan services online through their platforms. In addition, **Du Xiaoman also offered a range of WMPs that rely on intelligent recommendations of MMFs and investment products** which are viewed as being as safe as bank deposits but offer higher yields. However, captive audience that Alibaba and Tencent have amassed through their respective e-commerce and social network has been difficult for Baidu Wealth Management to replace. **Du Xiaoman Financial also offered micro-loan services with installment payment options to its partner apps' online consumers and users.** It owned several small financial licenses such as a third-party payment license and a fund sales license. However, due to the lack of a large user database, profile and transaction records, the micro-loan service did not attract a critical mass to sustain the operations.

In 2019, **Du Xiaoman launched a personal credit product named Panshi Xiaomanfen (磐石小满分), a personal credit rating system based on big data algorithm that can provide a credit score using personal features, credit history, compliance, and other dimensions.** The credit score of Xiaomanfen has a range of points from 350 to 950 points. The Xiaomanfen users with a score of no less than 700 points will obtain auto-provision of financing services based on credit consumption scenarios in its ecosystem. However, Xiaomanfen is less popular in terms of user coverage compared to Alipay's Sesame and Tencent's ZhifuFen. Du Xiaoman can only obtain information such as mobile phone numbers but cannot effectively identify its users like WeChat and Alipay. Therefore, Du Xiaoman's loan business is still at an early stage due to a lack of real-name identification process in Baidu's web browser business. Therefore, it is not surprising that Du Xiaoman needs to cooperate with Nanjing, Tianjin and CITIC banks to access financial consumers. Only after Xiaomanfen accumulates enough real-name account information can Du Xiaoman carry out credit business in various scenarios.

To obtain a private banking license, in 2017, Baidu and CITIC Bank formed a joint-venture digital bank, CITIC aiBank (originally known as CITIC BAIXIN Bank) with a registered capital of RMB two billion (USD 300 million). CITIC Bank holds 70% of the shares and Baidu holds the remaining 30%. CITIC aiBank's scope of operations include deposits and loans with key customers being individuals and MSEs, bank card business, bancassurance and interbank business. Like MYbank and WeBank, it only offers services via online banking without physical branches. "*AI is the core element of the bank's branding, and the bank will offer a spate of innovative services by riding on Baidu's technology in AI and massive amounts of data,*" the CITIC aiBank Manager said. Though a late comer compared to its tech rivals, Baidu's banking arm can still find a niche in the highly competitive market if it can identify the right customers and the right business model with the appropriate risk and cost

control mechanisms. However, it would not be an easy task given the already cutthroat competition in the industry. Alibaba and Tencent have already set up their own finance arms to offer a range of financial products including payment, wealth management and micro loans. In China's FinTech rival, aiBank will focus on lending to individuals and small businesses while leveraging Baidu's big data and AI to build new risk control models. Over 60% of the new bank's employees are technology staff. "*aiBank is the future of intelligent finance...Machine learning helps us understand our customers, automate finance provisions, provide seamless experience, predict credit, legal and compliance risks…. while maintaining a low-cost operating model. We also offer this capability to our partner banks so that all of us can benefit from AI*", said the Senior Technology Manager of aiBank.

Adopting the method of big data analytics, CITIC aiBank offers unsecured loans online to small business owners based on their creditworthiness without the use of property as collateral. In this way, it makes the procedure of lending to small business owners more convenient and reduces their financing costs significantly. "*aiBank is independent in terms of human resources, risk management, financial affairs and technical operation, which allows it to deepen substantive cooperation between a mainstream commercial bank and a mainstream internet company*," said the digital bank manager.

CITIC aiBank is a strategic deployment of China CITIC Bank's transformation and a strategic move to acquire opportunities in financial technologies. So, it is a win-win situation to both parties. "*The new bank will combine Baidu's technological advantages in AI, big data and cloud computing with China CITIC Bank's advantages in financial risk management, product development and offline channels ... to build a smart and inclusive bank in an online plus offline and bank plus business model by exploring an innovative approach of internet plus finance*," said the Deputy Bank Manager. Therefore, the **strategic alignment, technical know-how exchange and risk diversification are some key innovation drivers at CITIC aiBank.** The Legal and Compliance Manager added, "*The regulatory approval of CITIC aiBank signifies innovation within banking institutions to adapt to the growth of the internet-based economy. It will open a new space for traditional banks to do business and control risks online, thus better serving the real economy. And the regulators will also experiment with issuing more direct banking licenses."* AI is the core element of the bank's branding, and the bank will offer a spate of innovative services by riding on Baidu's technology in AI and massive amounts of data.

Why is it interesting to study Baidu Finance? From an organizational perspective, **Baidu Finance consists of two parts, namely, Du Xiaoman Financial and CITIC aiBank.** Du Xiaoman originated from Baidu's FinTech business group and was spin-off from Baidu Group

in 2018. It inherited the management team, operating model and innovation process from Baidu as a technology firm. CITIC aiBank was formed in 2017 with CITIC joint-stock commercial bank as major shareholder (70%) and Baidu controlling 30% of its interests. The management team and operational model were mainly from CITIC bank. Baidu provides technology know-how on AI-enabled credit modeling and process automation. From a market penetration perspective, **Baidu Finance lacks the consumer base and consumption scenarios to support its FinTech.**

MYbank has huge user traffic and transaction flows from Alibaba's e-commerce platforms (T-Mall and Taobao), while WeBank also has similar advantages from Tencent's social networks (QQ and WeChat). It is difficult for both Du Xiaoman and CITIC aiBank to obtain user identities, social profiles and transaction records from Baidu's search engine operations. This raised an inherent limitation for Baidu in its B2B (Business to Business) model to venture into consumer financing sector. It required a lot more investment, co-operation and creativity to obtain consumer data than those (Alibaba and Tencent) in the B2C (Business to Consumer) model. **Alipay and WeChat Pay together dominate over 90% of the mobile payment market in China.** Their payment process, user profiling and financing approval processes are much more mature and massively tested for the large number of users and usages. It is very difficult for Baidu to compete. **How did Baidu develop its innovation strategy and model to battle in China's FinTech industry? Was it a success or a failure after all?**

For the above reasons, it is therefore, interesting to study how a B2B operator ventured into a largely online consumer-based digital banking business. Based on the operating and financial performance disclosed by both Du Xiaoman and CITIC aiBank, it seems not a smooth journey for Baidu. What organizational change and adjustment has it made? How does it differentiate itself from Alibaba's and Tencent's roadmaps, in terms of the innovation process and model?

The next sections introduce the general business environment in which Baidu Finance operates, who the key players in China's FinTech industry are and whether Baidu managed to create its competitive advantages.

10.1 Business Environment

BAT (Baidu, Alibaba and Tencent) are three key major players in China's technology sectors, and all them ventured into FinTech operations in early 2010. In 2015, following the central government's guidelines to promote private commercial banking to resolve SMEs'

financing needs and expand financial inclusion in China, BAT obtained private banking license to set up subsidiary or joint-venture banks to operate deposit, financing and wealth management banking business online. Leveraging on the inherited technologies from their respective fields in AI, big data and cloud services, they quickly expanded into digital banking services through cooperation with financial institutions such as banks, insurers and asset managers.

By the end of 2015, China had had 500 million FinTech users, and its overall market size had exceeded RMB 12 trillion (USD 1.87 trillion). Four Chinese companies, namely Tencent, Alibaba, Baidu, and JD, were also amongst the top ten public internet companies in the world. In 2016, China had eight of the world's 27 FinTech "unicorns" (companies that investors value at more than USD one billion) (McKinsey, 2016). There are several reasons as to why China's FinTech industry developed so rapidly. First, China had an open and supportive regulatory environment. In fact, in 2013, PBOC explicitly expressed support for tech companies to promote FinTech. Second, China had a highly developed e-commerce sector, with more than 30% of the Chinese population already using Internet payment systems. Third, there was enormous latent demand for inclusive finance. Due to historical protection and strict regulation, traditional players were moving slowly to meet underserved customer segments such as SMEs and low-income earners, opening the door to disruptors. And finally, Chinese consumers are more open to sharing data, especially the post-1980s and post-1990s who are the main users of FinTech.

These players can be grouped into three main categories according to McKinsey (2016). **The first category of players consists of internet disruptors**. These companies are responsible for most high-profile innovations that have disrupted China's traditional finance industry and received the most public attention. Most notably, this category includes well-known internet giants like BAT. Millions of people use Tencent's WeChat Pay and Alibaba's Alipay daily to make third-party mobile payments. With their all-encompassing digital platforms and extensive ecosystems that penetrate into the daily lives of consumers, players in this category can collect a massive amount of data, which they can use to their advantage by predicting consumer behavior and offering more personalized and innovative products. Alibaba, for example, expanded into wealth management with its Yu'e Bao, which had RMB 700 billion (USD 109.34 billion) of assets under management (AUM) and which became the world's second largest MMF within just two years. China's national credit rating system was also relatively underdeveloped, and players in this category were using the large amount of data they had to develop credit rating scores for individuals. Alibaba's online credit rating agency "Sesame Credit" is the most prominent example. Tencent took another route by expanding

beyond the powerful social nature of its WeChat platform to build a consumer-oriented financial network that taps into its huge user base.

Baidu took a different approach to FinTech entrance. Baidu leveraged on its AI and big data capabilities to intelligently target and match customers with the right products and identify and prevent fraud. Furthermore, this capability can also assess credit risk through its proprietary data and modelling capabilities. While the company positioned its financial services business as a FinTech business using technology effectively to differentiate itself, credit rating agencies considered this to be a high-risk business. However, some financial analysts placed Baidu on negative watch as it started moving into unsecured consumer loans and uninsured investments, which were considered to be riskier and "part of the shadow banking system" in China. They also questioned its ability to rival against Alibaba and Tencent which have a strong base of 2C business and user traffic in their core businesses. While Search Services remain the most valuable segment for Baidu (accounting for more than 80% of its valuation, according to our estimates), the company is diversifying into several other areas to leverage its AI capabilities. Further, after stricter regulations, advertising on search engines is now controlled, leading to lower revenues for Baidu.

Financial Services are a growth area for Baidu, and the company needs to expand in this segment to stay competitive against such players as Alibaba and Tencent. China's financial industry is growing at an exponential pace, and there is demand for a more inclusive finance system. A large population of the country falls in the lower income category and does not meet the criteria laid out by many banks for credit products. This gap is being filled by technology giants such as Baidu, who are using big data and AI to determine the creditworthiness of individuals. While there is certainly demand for this, it is a high-risk business. **While Baidu believes that its AI capabilities can help manage the credit risk of consumers, the company needs to tread carefully on this path. Baidu already faced a significant reputation loss when misleading medical advertisements from its Baidu search result** contributed to the death of a college student. This impacted its search business negatively. And the company needs to ensure that its financing arm does not run into similar misrepresentations and wrong target groups as it extends to unsecured loans.

The second category of players consists of traditional financial institutions. Although FinTech and other players in the industry could be viewed as a threat to them, these players are eager to harness the advantages of FinTech innovations so that they do not miss out on the opportunities within the industry. Incumbent financial institutions are accelerating their push into the FinTech sector. Institutions such as Ping An Insurance Group are strategically entering

the sector through subsidiaries including Lufax, Pinganfang, and Ping An Puhui. In addition, LCBs are acting in the same way, for example, CCB and ICBC are now building their own e-commerce platforms.

To make the most of the opportunities, many traditional financial institutions have published FinTech strategies. ICBC published its "e-ICBC" FinTech strategy, which offers a range of products and services in the areas of payments, financing and wealth management. ICBC and other traditional financial institutions are able to offer a range of professional products and services developed from years of experience and institutional knowledge. The high profitability of the traditional banking sector has also put it in a strong position to invest in the FinTech industry. Traditional players also have several strengths that should not be underestimated, such as a legacy of strategic partnerships, comprehensive product offerings, professional risk-management expertise, and physical branches.

However, compared to other FinTech players, traditional financial institutions face stricter regulations and are more conservative in their approach, which means they are followers rather than leaders in the industry. To put themselves in a more advantageous position, traditional financial institutions have formed partnerships with players in other categories. For example, China CITIC Bank founded Baixin Bank with internet search engine giant Baidu, and the Bank of Beijing is collaborating with Tencent. This shows that FinTech players can put themselves in a stronger position by engaging in mutually beneficial collaboration rather than outright competition.

The third category of players consists of non-financial core companies. This category includes well-known retail companies like Gome and Suning. These players have an advantageous position in the value chain with their existing strong networks which allow them to access a large amount of offline data. Further, there are less activities by internet attackers and traditional financial institutions in this sector. With these advantages, non-financial core companies can offer FinTech products and services to both their customers (business-to-consumer) and SME suppliers and distributors (business-to-business). Despite being a crucial part of the Chinese economy, SMEs are one of the groups that were previously underserved by traditional financial institutions. Retail companies Gome and Suning, and real-estate group Wanda Group, which are combining extensive offline resources such as customer leads with data mining to design new financial products. In doing so, they threaten to undermine banks' control over key business customers.

What are the potential opportunities and innovation challenges to Baidu in its FinTech rival

limited by the lack of a B2C business segment? Given the importance of the collection and analysis of big data to the industry, there are opportunities for data analytic companies to collaborate with FinTech players that do not have the capability to do this by themselves. There are also many ways for AI companies to collaborate with FinTech players. For instance, **Baidu's AI can be used in FinTech by eliminating or reducing face-to-face interaction, which will help reduce transaction costs. Baidu's stock trading app, StockMaster, already uses AI to predict share price changes. With its strengths in business-to-business segment, Baidu is also involved in niche sub-segments like offering loans for cosmetic surgery.** As the earliest and most important fist product of Baidu's financial sector, the education installment product not only brought huge profits to it, but also helped it brush a little presence in the fierce mutual gold market. However, the business risks of education staging itself and the logical flaws of Baidu's intervention, coupled with excessive growth, caused the risks to be quickly accumulated and amplified, especially in the recent COVID-19 pandemic outbreak. Many countries were locked down and overseas travelling was restricted.

What are the challenges ahead for FinTech operators in the current situation and operating environment in domestic and overseas markets? Although there are many opportunities in China's FinTech industry, most of the activities in the industry have been by domestic investors. One of the main reasons for this is the government restrictions on foreign investors. PayPal was not able to secure a license for domestic payments, and foreign investors were excluded from fundraising for Tencent's WeBank. Even in areas where foreign investors have invested in the domestic market, they have faced cultural differences. Apple Pay's success has been limited because unlike its Chinese competitors, it has not been integrated into important platforms such as WeChat. It is likely that in the long run the government will ease some of the restrictions on foreign investors so that China and its domestic players can benefit from foreign innovations, capabilities, and expertise.

In the overseas markets, especially Asia Pacific countries, although the big Chinese players like BAT are trying to internationalize, it is hard for them to replicate their domestic success and easier for foreign companies to compete against them. Chinese FinTech players are collaborating with domestic players through partnerships, M&As and technology transfers. For example, in 2016, Ant Financial invested in Paytm, an Indian mobile payment company, and began its global strategy of local e-wallets. Due to the large Indian population, Paytm's user base grew from 25 million to 250 million within a year. Ant Financial is flexible to adapt to local business culture and consumer behavior. TnGD (Touch 'n Go Digital), for example, a local e-wallet created by Ant Financial in Malaysia, targets users in a variety of traffic scenarios. TnG

card-swiping signs can be found throughout Kuala Lumpur's public transport, undergrounds, railways, motorways and other locations.

Another important challenge that investors face is changes to the regulatory environment. Previously, loose regulations provided the industry with opportunities and was one of the reasons why the FinTech industry developed so rapidly in China. However, Chinese regulatory authorities strengthened their regulatory role to ensure that the industry develops more healthily. The need for an increased regulatory role was highlighted by fraud cases, such as the E'Zubao P2P lending scheme, a Ponzi scheme which had nearly one million victims and was subsequently closed in 2016. The government's concerns about initial coin offerings (ICOs), a disruptive technology, led to their ban in 2017.

Although there are still many opportunities for growth in the industry, the introduction of a regulatory framework and fiercer competition will likely lead to a period of consolidation. The players that emerge on the top will be the leaders who are able to make the most of the opportunities through innovation and skillfully navigating challenges and regulatory uncertainty. "*BATs have already shown that services like wealth management can be provided to anyone at an affordable price, relative to the value, which often means incredibly cheap.*" Despite the regulatory challenges, the FinTech future is very promising. "*In China, this has already increased the cost of capital for banks as deposits move onto these online finance platforms and is affecting product revenue as distribution channels shift from the traditional models to online and mobile platforms,*" said the Du Xiaoman product manager.

In response to these challenges, how will Baidu Finance (namely, Du Xiaoman and CITIC aiBank) adjust their business strategies to navigate through the increased regulatory compliance and market competition? This question is addressed in the next section.

10.2 Business Strategy

Baidu is aware that the revenue per user from its search engine was undermined in the past. "*So far, only 1% of the financial service needs generated in Baidu scenarios have been met. The room for growth would be huge in the future*." The Consumer Finance VP also talked about the acquisition of potential financial service customers, users in the Baidu ecosystem, by searching for the information they need, truly express their needs on such topics as shopping, travelling, MBA, vocational skills, renting, decoration, marriage, as well as financial management, investment and wealth management. Besides the expression of real

needs, there exists a vast amount of need for financial service exists. AI and FinTech would be the most appropriate solutions for dealing with different types of needs.

Baidu's access to personal data is much weaker compared to Alibaba, Tencent, and JD.com, since users do not need to resign and log in for searching, while they have to do so for shopping on Alibaba or communicating on WeChat. However, the Product Manager still believes in the potential of Du Xiaoman. **The search service of Baidu could help Du Xiaoman gain a better understanding of consumers' needs. Then, Du Xiaoman could cooperate with the merchants that advertise on Baidu to provide financial services for consumers.** For example, Du Xiaoman achieved great success in serving consumers in the education industry, and merchants like English training institutions or continuing education institutions needed to advertise on Baidu.com. Then Du Xiaoman could use this basis of cooperation to meet consumer needs for financial services.

In June 2017, Baidu's CEO Robin Li announced Baidu's "**Intelligent Finance"** concept which entailed a comprehensive integration of AI and digital banking in four key areas.

The first focus area is consumer financing. The Chinese consumer finance market has been booming recently. For example, as of January 2019, the amount of outstanding Chinese consumer loans, excluding mortgages and auto loans, had reached RMB 9.3 trillion (about USD 1.4 trillion), compared to just RMB 3.5 trillion in January 2015 (about USD 563.1 billion). The compound annual growth rate was 27.4% from 2015 to 2019. The consumer behaviors and purchasing experiences moved from offline to online, which created massive opportunities for FinTech firms to offer innovative and just-in-time financing solutions to the needed through various distribution channels and usage scenarios.

The second focus area is intelligent investment including investment research & consulting and wealth management. With increased maturity in China's capital market, using big data and AI, Baidu believes a truly wealth management platform with investment capabilities can better adapt to the market. This includes process and output standardization, investors risk analysis and profiling. Specifically, real-time monitoring and alerts of investment risks can quickly respond to market changes to serve the needs of the mass group of individual investors.

The third focus area is insurance. For example, users are allowed to report car insurance claims in real time and leave the accident site immediately provided there is little damage to the vehicles. Enhanced data collection from cars, wearables, and smartphones will further enable automation of claims. If accidents occur, diagnostics from these devices will

automatically contact insurance providers, process claims immediately, and even withdraw payment from designated bank accounts. The fourth focus area is asset securitization. Asset securitization business has been under the rapidly developing exchange market. In 2011, the cumulative issuance of asset securitization products exceeded RMB 1.5 trillion, and more than half of them were issued in 2017. Baidu believes that Public-Private-Partnership (PPP) asset securitization, Real Estate Investment Trust (REIT) and supply chain payables are among the most popular applications in AI-enabled asset securitization.

How does Baidu realize its FinTech strategy as stated above? Baidu Finance achieves its strategy through two basic models, namely, **equity investment and technology collaboration**. Du Xiaoman and CITIC aiBank are examples of equity cooperation through direct investment and joint venture. In CITIC aiBank, CITIC Bank contributes to the JV its product R&D and innovation capabilities, customer profiling, risk management and internal control systems. Baidu, on the other hand, contributes its Internet technology and user traffic resources to satisfy customers' personalized finance needs, and to create differentiated direct banking products with unique market competitiveness. Leveraging on Baidu's AI and cloud computing capabilities, CITIC aiBank was able to provide RMB 150 million loans to ten million people in just four months since its establishment.

For the technology cooperation method, by June 2018, Baidu Finance had had cooperation agreements with more than 400 financial institutions in China to provide technology know-how in AI to help automate the traditional banking process for cost efficiency and productivity gain. The calling for Baidu's financial API services was up to three million times a day. For example: Baidu and ABC jointly set up a FinTech Laboratory to help ABC navigate through the digital transformation process, which included smart banking, real-time credit rating, intelligent marketing, robotic customer service and auto-provision anti-fraud programs. Baidu provided open technology in online risk control to financial institutions, enabling them to quickly acquire the technology instead of being stuck in the long internal development cycle, and to work with third-party data providers to modify and develop their own credit data models. Baidu also provided customer profiling capability to help financial institutions better KYC (Know Your Customer) and develop customer insights that can help reduce credit risks and enhance revenues from up and cross selling of financial services. Lastly, Baidu also provided pen product innovation capabilities, such as risk-based pricing capabilities to financial institutions to enable them to maximize household value and design diversified financial products based on smaller customer units.

10.3 Business and Innovation Performance

According to the Consumer Finance VP, in terms of financial and operational performance, by November 2018, Du Xiaoman had had cooperation with more than 50 commercial banks and consumer finance companies. The amount of accumulative loan was about RMB 250 billion which was distributed to more than seven million MSE owners. The accumulative interest income generated for partner banks had exceeded RMB five billion, and the NPL rate had been lower than the industry average. At the beginning of 2019, Du Xiaoman credit users raised 330 million, with a total loan size of RMB 380 billion yuan.

For innovation performance and activities, in October 2018, the Peking University Guanghua · Du Xiaoman Financial Technology Joint Laboratory was set up in Beijing. The Laboratory focuses on five areas of FinTech, namely, digital asset, mega networks, online robots, regulatory technology, and blockchain technology. It actively explores the application of cutting-edge technologies in financial scenarios, while promoting the cultivation and output of interdisciplinary talents. Du Xiaoman also signed a strategic cooperation agreement with the Bank of Nanjing. The two parties jointly promote FinTech innovation, develop in-depth business cooperation in consumer finance, small and micro finance and other fields, and diffuse the innovation results to Nanjing Bank's "XinHe Finance Club" which consists of more than 100 commercial bank member units, to enable more financial institutions to use AI to serve the real economy and practice inclusive finance. The FinTech innovation focuses on nine areas, namely, payment and settlement, inclusive finance, retail finance, corporate finance, depository and custody, interbank finance, FinTech, cross-border services and joint marketing. It provides financial technology solutions (AI and Big-data capabilities) and work with ecological partners to build a financial technology ecosystem to help financial institutions (local CCBs, mainly) in the banking digitalization process.

In the same year, the "Financial Technology Joint Innovation Lab" was jointly established by Baidu and ABC. The cooperation mainly focused on the field of financial technology, including the joint development of "financial brains" and customer portraits, precision marketing, customer credit evaluation, risk monitoring, intelligent investment consulting, and intelligent customer service for specific application scenario and financial product matching. In terms of new technology innovation, in 2017, Du Xiaoman officially joined the Hyperledger (abbreviated as "super ledger") open source project of the Linux Foundation and became a core board member of the project. Baidu and PayPal also signed a strategic cooperation agreement to cooperate and provide a better payment experience for overseas Chinese consumers through

the payment capabilities of Baidu Wallet.

For CITIC aiBank, according to its latest annual report of 2019, it had a total of 691 employees, of whom over 60% were in technology domain. The average age of CITIC aiBank's staff team was just 31 years old. In 2019, CITIC aiBank extended over RMB 120 billion in loans to bank 32.15 million customers, an increase of 167.54% compared to the start of the year. Operating revenues were RMB 2.373 billion in 2019, a YoY rise of 83.23%, while net profits were RMB 20 million. CITIC aiBank's net interest spread of 4.91% was higher than the industry average. CITIC aiBank's services are provided online. And around 50% of customers are situated in Tier-3 or lower-tier Chinese cities. By 2019, the bank had developed "350+ API" interface that can connect to over 80 scenario-based applications, permitting open banking model like WeBank. The bank had also developed a smart risk control system based on a wide range of data on small enterprises, including their operational data, transaction data, and industrial and commercial data. "*Using more than 16,300 data tags divided into 13 categories, the risk control system can create accurate client profiles. By cross-checking various data, it helps the bank avoid the risk of lending to people who have borrowed too much through various financing channels,*" said the Risk Control Manager of the bank. Technology is essential to the growth of the bank, of which technology investment accounted for 60% of its total investments in 2019.

In early 2000, The Chinese central bank unveiled the debut set of FinTech innovation regulatory trial applications for Beijing's new FinTech sandbox. According to an announcement made by PBOC via its official website on January 14, 2020, the first set of trial applications will involve areas including IoT, micro-and-small loans, smart banking and mobile phone point-of-sales (POS). One of the six innovations recognized by the Authority is CITIC Bank Smart Token Product (中信银行智令产品), which is a collaboration between CITIC Bank, China UnionPay, Du Xiaoman and Ctrip, and which makes use of an API open banking environment payments token technology to create a "smart token" for facilitating interactions between commercial banks, e-commerce enterprises and other businesses. According to its developers the product will "*optimize service processes, expand application scenarios, innovate cooperation models and raise the quality of financial services*." CITIC aiBank's aiBankInside product also makes use of an API open banking environment to provide "plug-in" financial services that can be integrated into a broad range of settings and scenarios.

10.4 The Fall of Du Xiaoman

The key issue with Du Xiaoman's market performance is strategic misalignment between its search engine business and FinTech operations. Although Baidu tried to segregate and provide more autonomy to its FinTech business through a private firm Du Xiaoman and a joint-venture digital bank with CITIC, the result is far less than satisfactory.

The fall of Du Xiaoman can be witnessed from the departure of its leadership team. In the second half of 2018, the division leaders of consumer finance, wealth management and asset management business lines, left one after another. Before that, the Chief Risk Officer (CRO) and the head of FinTech also resigned. In August 2019, the former CEO, Zhu Guang, stepped down as Chairman and the Consumer Finance Vice President (VP) took over the role. By 2020, the "Superhero Team" that was created by Baidu Finance had disappeared. Although the VP said that the leadership change is a normality in the FinTech sector and the strategic direction and operation model of Du Xiaoman remained unchanged, he admitted that the recent continuous changes in personnel had also casted a shadow on the company's prospects.

At the back of the leadership change was Baidu's inability to develop financial services by leveraging on its search engine, video streaming and cloud storage businesses. Baidu Finance was unable to develop a clear roadmap for its FinTech business after exhausting some of its best personnel resources. "*We change our strategy and operation model too frequently. We are unable to find our own identity in FinTech. We are moving too fast and expect to see results overnight. We do not really understand how banking business works but we are already in it*," said the former Product Manager.

But there may be some deeper factors worth rethinking when reviewing its history. The future of a FinTech firm largely depends on the ecosystem it is rooted in. The failure of Baidu's O2O (Online-to-Offline) strategy, lack of user profiling and information topology, and the migration to mobile internet ecology impacted Du Xiaoman's access to individual and SME financial consumers. "*Baidu's search engine business does not require it to acquire, map and develop comprehensive user service capabilities. Instead, it focuses on technology and tools to make the search engine more intelligent. It does not develop comprehensive insights into user needs and lacks sufficient appreciation for user experience*," said the Former Operation Director. The banking operation has stringent credit and risk management, regulatory compliance and business logic. A simple stacking of resources from traditional banking or a replication existing model cannot establish its own long-term capabilities and core advantages.

For Internet firms to enter the FinTech business, “mobile payment” and “user traffic” are two key pre-requisites, and Baidu has both. But why did Baidu still fail to compete with Alibaba and Tencent? From a timeline perspective, it is not too late for Baidu to get into the FinTech business in China. In 2013, known as the “the Year of FinTech”, Baidu obtained a third-party payment license, established Baidu Financial Center, and launched a financial management product called “Baidu Baifa”. At that time, the mobile Internet market had just started. WeChat Pay and Alipay just entered into the market with “red packet” and “Yu'e Bao”. With its longstanding resources in Internet technology, user traffic and business brand, Baidu was expected to earn a place in China’s FinTech market.

In April 2014, Baidu’s third-party payment mobile app branded “Baidu Wallet” was officially launched. Zhang Zhenghua, who had led the development of Alipay was headhunted and appointed as product leader for “Baidu Wallet”. Baidu Wallet was built into Baidu’s own apps such as Baidu mobile search engine and Baidu Maps to cultivate consumer habits in Baidu ecosystem through mobile transfer, purchase payment, utility payment, top-up, recharge and other services, charging no handling fees, while WeChat Pay and Alipay charged handling fees of 0.08% for cash withdrawal. Baidu also incorporated “Baidu Wallet” into the websites and mobile apps of its investments such as Ctrip (a traveling agent), Noumi (a group buying site), Qiqiyi (a video streaming service provider) and China Uber (a car hailing service provider). To promote merchants to join the Baidu digital payment ecosystem, Baidu offered discount coupons and other rebate incentives to increase the Baidu Wallet user scenarios.

The introduction of massive resources indeed brought a good start to Baidu’s payment business. By the end of 2014, Baidu Wallet’s share in the mobile payment market had reached 2.2%. In addition, Baidu had scenarios in the ecosystem where payments could be embedded, such as providing financing services to those searching for education, medical services, housing, renovation, vehicles and travelling information. These are important scenarios for increasing user adoption and stickiness. But unfortunately, it failed to continue the FinTech development journey and market share. Noumi, Ctrip and China Uber did not perform well in their own market domains and therefore failed to attract user traffic to Baidu Finance.

In fact, Baidu also tried to establish a connection between its search business and FinTech. In March 2014, the Baidu financial website (‘website’) was launched to provide users with online financing and loan businesses by cooperating with local financial institutions. However, the relationship between “search engine” and FinTech is weak compared to e-commerce and social media. In addition, the entrance barriers, business logics and compliance thresholds for FinTech/banking operations are much higher than Internet Business which Baidu is good at.

Later on, Baidu launched WMPs, crowdfunding, lending and other products on its website. However, WeChat and Alipay already captured 80% of the Chinese market. These products failed to provide Baidu Finance with the expected consumer traffic and cash flows. Instead, they created some regulatory compliance issues to Baidu. Eventually, the website was decommissioned.

After more than a year of exploration, trial and error, Baidu decided to further enhance the strategic position of the financial sector. This change was first reflected in personnel and organizational structure changes. On December 14, 2015, Baidu announced the formation of a Financial Services Business Group (FSG). Mr. Zhu Guang, Vice President of Baidu, served as its General Manager and reported directly to Robin Li, CEO of Baidu. Consumer finance, Baidu Wallet, FinTech and other teams were all incorporated into FSG. Before FSG, Baidu also set up three business groups, namely, mobile service, emerging industry and search engine business groups.

Being an independent business group, FSG enhanced the authority of the financial team within the group, and better integrated and leveraged the resources within Baidu ecology. Meanwhile, to address the issues of shortage in financial service talents, Baidu and FSG began to headhunt many banking executives from traditional banks and FinTech firms. For example, two senior executives from Everbright Bank and Lufax (Ping An Bank's FinTech firm) were recruited to be responsible for wealth management, asset management and consumer finance. Both were well-known "asset management" and consumer finance professionals in the banking industry. Leading professionals in risk management, big data analysis, mobile technology R&D and product strategy were also pulled together to form the core leadership team of FSG. It focused on five key areas of FinTech development including identity authentication, big data risk control, and intelligent investment consulting, quantitative investment and financial cloud.

2016 was indeed the most active year in Baidu's Finance. For example, Baidu announced the launch of CITIC aiBank with CITC Bank, the introduction of BaiAn Insurance with Allianz Insurance (it was subsequently discontinued in 2018), and the establishment of Xi'an BaiJin Internet Financial Asset Trading Center. There were two important backgrounds for the rapid development of FinTech sector in 2016. First, the 4G, cloud computing, O2O e-commerce and mobile Internet fast development, and the regulatory environment was also pro-FinTech innovation. Second, Baidu suffered from the consequences of its traditional search engine with the false promotion of hospital information leading to a death of a student. Some new business highlights were needed urgently to shadow the public voices.

In Q2 2016, when Baidu search engine was struggling in the most difficult time, the performance of FSG was quite eye-catching. The number of active users of Baidu Wallet reached 80 million at the end of June, a year-on-year increase of 131%. “Baidu YouQianhHua” (a consumer education loan product) had reached cooperation with more than 600 education and training institutions through education financing products with its business covering more than 95% of the provinces in China. By the end of the year, the number of cooperative institutions had reached 3,000 and the number of students served had also increased by 45%. Baidu's 2016 Q4 financial report mentioned that the market share of “Baidu YouQianHua” in the field of education credit had reached 75%.

As the earliest and most important fist product of Baidu Finance, the education installment product not only brought huge profits to it, but also helped refresh its image in the market. This also allowed FSG to get more resources and funding from Baidu to invest and promote it in a very short time. However, the business risks and the logic defects of the products began to increase significantly with the excessive growth and undermanaged risk exposures. Unlike e-commerce and social media, Baidu did not have a good knowledge of the consumer and cooperative institutions for the educational financing. Baidu’s consumer finance business heavily relied on its search engine. Since Baidu search was the largest online student acquisition channel for various training institutions, Baidu had a natural advantage in expanding this business and education instalment was once its most profitable financing business.

The limitations of education loans soon became apparent. Not only did the “run-away” of training institutions happened frequently after obtaining the school fees, but education loans also became a social issue of “refinancing loans”. Some students were forced to finance old loans with new loans, and the amount of outstanding loans became a few times of the original loan amount. Illegal forces such as insultation, beating, threatening and distribution of naked photos of the victims were used to collect loans. The social impacts stroke the authority’s nerve and Baidu Finance was called to decommission the product as more and more cooperative institutions were found involved in scandals of fraud and unscrupulous loans.

The excessive growth and potential risks also affected Baidu’s credit rating. Moody’s report showed that Baidu was downgraded by international rating companies. The reason was the rapid growth of financial business with higher financial and execution risks compared to the core business. In 2017, the core FSG management team left in sequence, casting a shadow on the developing Baidu Finance.

In order to strip away the risky business and reduce public opinions on Baidu, and for the

longer-term development of FSG, Baidu Finance officially split FSG from Baidu in April 2018 and renamed it "Du Xiaoman" to start independent operations. Zhu Guang, FSG's general manager, continued to serve as the CEO of Du Xiaoman Financial. Independent operations of FinTech was a mainstream trend among the technology firms, such as Ant Financial's split from Alibaba and JD Finance's split from JD. The FinTech business gained higher valuations and more attention through independent operations. Du Xiaoman's first round of financing was USD 1.9 billion, with a valuation of about RMB 30 billion. After almost six years (since the establishment of FinTech department at Baidu), Du Xiaoman was still finding its own differentiated advantages in the FinTech industry.

According to the data disclosed on the first anniversary of Du Xiaoman Financial in April 2019, its payment business had 140 million retained users after the Spring Festival, and the annual settlement scale was nearly one trillion. This was the result of Baidu's cumulative investment of nearly RMB two billion for the Spring Festival red packet interaction. According to the rules, "withdrawal" of red packet money must pass through Du Xiaoman's mobile app wallet. WeChat and Alipay had one billion active users, respectively. According to a report released by an independent party in Q1 of 2019, Baidu Wallet's market share did not rank after JD Payment, Suning Payment, and One Wallet. It ranked even behind Quickpay and Yibao payment.

In the financial industry, it is believed that "who get the user data will get the FinTech world", and the same applies to the FinTech field. User traffic and data can not only help build user profiles and increase user stickiness, but are also a necessary condition for forming a closed loop of cash flows and transactions. Baidu seems to have missed the most important ingredients in the FinTech success formula, which is consumer traffic and data.

10.5 Baidu Finance: Aspects Related to Research Questions

This section tries to answer the research questions. Data in this section were primarily based on fieldwork observations and interviews with officers from Baidu Finance. Responses specific to Du Xiaoman and CITIC aiBank were documented and presented separately. Semi-structured interviews and discussion workshops were conducted in Baidu's building in Beijing. Some interviews with former officers of Du Xiaoman were conducted privately in an informal setting or phone conversation format. Interviewees are asked to share specific examples from their business functions and describe the innovation and compliance process in detail.

Interviewees included Bank Manager, Deputy Bank Manager, Senior Product Manager, and Legal and Compliance Manager from CITIC aiBank, and Former CEO, Former Operation Director, the Consumer Finance VP, Product Manager, Risk Control Manager and Chief Product Architect from Du Xiaoman; and International Communication Director from Baidu.

10.5.1 Financial Innovation Process

When asked about the innovation process at Baidu Finance, the Consumer Finance VP and Risk Control Manager used the risk management innovations at Du Xiaoman to describe the product, service and capability development process. The risk management process at Du Xiaonman consists of five core phases, namely, customer acquisition, identity verification, credit assessment, validation and monitoring.

- Customer acquisition includes activities to identify target customers via their search/browsing history, map user needs to Du Xiaoman's product offering, automate direct marketing to target customers through search engine optimization and obtain personal data for financing applications.
- Identity verification includes activities to validate real person and applicant's identity through face, voice, sim card and OCR recognitions, identity verification with police system, credit standing verification with PCOB or court systems, and tp filter potential fraud or financial scandal groups using AI and big data capabilities
- Credit assessment includes activities to develop the credit rating of the applicants based on customer data provided by merchants, credit database at PBOC, user profile, records and browsing history at Baidu. The applicant's database will be processed by Du Xiaoman's AI-enabled credit model to determine the credit amount, terms and period to be granted to the applicant.
- Before loan disbursement, a final credit validation is conducted to validate the credit assessment, review and program auto-alerts for changes in the applicant's credit profiles/standing, identify parameters to enable early detection of credit default risks, and program preventive controls to reduce financial fraud risks (anti-fraud program).
- After loan disbursement, periodic credit monitoring activities are conducted to regularly review the loan status, activate anti-fraud program, identity early signs of unusual activities in the loan accounts, review changes in the borrower profile and credit standing, review

early warning of credit default risk, and activate smart collection programmed actions to improve loan recovery rates.

Unlike most IT research and development projects**, the product development at Du Xiaoman begins with target users and identification of application scenarios.** According to the Product Manager, Baidu had over one billion mobile devices installed on Baidu apps (14 apps had over 100 million registered users) and over six billion searches every day. Baidu covered over 95% Internet users in China as everyone was using Baidu search engine to browse. Based on an estimation from Baidu research, out of the 330 million qualified credit users in China, only 60 million users had access to online credit information and only 17 million users had applied for loans online. The search data could accurately identify the needs of the users at a time and under a specific application scenario. Combined with time-serial data about the user Internet activities and multidimensional analysis of the user behavior, an enriched user profile can be developed to provide accurate insights of the user needs and suggest an appropriate user touch points to convert the user needs/interests into financing needs. "*Using machine learning, we can enhance the accuracy of customer acquisition by 40%,"* said the Product Manager.

Using data analytics, the product develops a few scenarios of where financing service and wealth management needs might be required. **Then, the product team will map the target customers and scenarios and develop user experience (journey) mapping.** User Experience Mapping is used to understand what customers go through and improve the quality of the customer experience, ensuring consistency and a seamless experience at all touchpoints and across all channels (user interface) within the Baidu ecosystem. Much of the information for creating a user experience map comes from users' personas (such as their goals, motivations, key tasks they want to accomplish, and current pain points). The product manager explains that, for example, a user searching for education information can represent a student, a parent, a teacher or a researcher. Next, Baidu will apply its AI power to analyze the user's Internet behavior, records, personality and other databases to determine the specific persona the user will be. Once the team has created distinct personas, the product team will study the persona's experience at various touch points during the entire lifecycle of Baidu and its partners in the ecosystem. Then, the user experience journey will be organized by customer stages (sometimes referred to as phases). Each stage represents a major goal your customer is trying to achieve in their overall journey. For example, the educational financing product has seven stages of user experience, namely, discovery, exploration, application, contract signing, drawdown, repayment and settlement. Base on this, the product team will describe the touchpoints the customer uses to interact with Baidu's ecosystem. For example, the customers may find the

financing service online or in an advertisement, see ratings and reviews, visit Du Xiaoman website, make some enquiries, compare financial products and offerings, understand the terms and conditions, make an online application on the website or in the mobile app, or contact the customer service. Next, the product team will conduct research to validate the users' personas and their experience maps. Based on the customer research result, the product team will determine the product features, the internal systems, processes, and people that are involved in delivering that journey.

Afterwards, **the product team will submit a complete product proposal to the Legal and Risk Management Committee (the Committee) for review and approval. The Committee will review the pre, during and post credit control procedures automation and anti-fraud program that are embedded into the product design.** For example, based on the real-time customer behavioral data, the use of deep learning model and multidimensional customer tagging can allow Du Xiaoman to monitor the behavioral and need changes of the customer. The system also allows real-time monitoring of the account balances to identify early signs of payment delay or default risks. Using Test & Lean market platform, data about similar financial product offerings in the marketplace are collected in a real-time manner, so that Du Xiaoman can adjust its product features, terms and offerings more intelligently and quickly. After release of funds, a smart collection robot is installed to monitor the performance of each loan. Customers with delayed repayments will be analyzed based on different models, profiles and strategies, and specific programmable actions will be triggered to segregate the risks and impose collection enhancement actions. Smart robot, which has the advantages of process standardization, programmability, zero complaints, high productivity and a high collection rate, can reduce human resources cost by 40-50%, according to the Risk Control Manager.

Finally, **the product team will work together with Baidu's appropriate distribution channels to promote the product to the target user groups based on specified user experience (journey) map for effective customer touch points.** The channels here can be Baidu's own product ecosystem (such as Baidu Search, Baidu Map and Baidu Wallet.) and Baidu's partner network (such as educational institutions, hospitals and car retailers). For example, Du Xiaoman also provides its big data risk management technology to its financial institution partners to effectively reduce credit default risks. It can provide technical integration or product applications to the partner institutions in exchange for customer data and capital flows. It helps the partner institutions to assess, approve, monitor and risk alert the customer credit requests using its AI and big data capability. This is very efficient (and a win-win for both) in cases of unsecured consumer loans to low-net-worth individuals and SMEs, a large

market which the partner institutions are unable to tap into due to transactional cost and user data barriers.

When asked about the product and service innovation process at CITIC aiBank, the Bank Manager responded that it is very much a combination of both CITIC and Baidu Finance. In general, it follows CITIC bank's new product innovation process, which is product conceptual planning; proof of concept validation; product development; legal, compliance and risk assessment; and product enhancement, testing and diffusion.

According to the Senior Product Manager of the Bank, the innovation process at aiBank begins with product conceptualization and planning. aiBank will take advice (or instruction) from its shareholders (CITIC and Baidu) on the product development roadmap. CITCI aiBank focuses on services for individuals, MSEs, farmers, and agricultural companies in rural areas. Key product roadmaps include consumer finance products and lending for MSEs, both purely online and through WMPs. The bank seeks to provide intelligent and inclusive finance by developing smart accounts, intelligent risk control and other features through online and offline banking. It integrates its services into various life scenarios and industrial ecosystems.

Based on the agreed product mandates, the product team develops the conceptual paper of the product features, the target user groups and application scenarios. The conceptual paper will be presented to the shareholder NPD group (the "Group") for review and comments. The conceptual paper will be updated and revised based on feedback comments from the Group. Once it is approved, it will move on to the next stage of proof of concept validation. At this stage, a regulatory sandbox will be set up for user, product and market interactions in a controlled sandbox environment. User behavior, product performance and market reaction data are collected and analyzed to enhance the product features design.

Next, the product team will develop a full business to explain the product features, user groups, use cases, expected resources, product life cycle management and expected returns from the product. To secure the resources, the product business case needs to obtain approvals from the Group. Once approved, the Product teams will integrate resources and put together technology stacks to develop the product using an agile development model. The product will be put into the regulatory sandbox again to validate the compliance and control features.

After that, the enhanced product features, together with the regulator sandbox data will be submitted for legal, compliance and risks assessment. Usually, control automations and risk alerts are required to program and add on to the product designs to enhance data collection, and risks prevention and abnormalities detection.

Finally, a full product development and upgrade might be needed to get ready for commercialization and regulatory approval. Additional testing and product enhancement might be needed based on regulatory requirements. The product will be diffused in CITIC's and Baidu's distribution channels and promotional activities will be carried out accordingly.

From the above analysis, Baidu Finance adopts a user-centric innovation model. User-centric innovation was popular in the pre-recession economy. It suggests that the way to create innovations is by starting from users, getting closer to them and better understanding their current needs (for example, through a deep analysis of their behaviors and how they use existing products). User-centric innovation is a customer-driven approach that creates innovative ideas—seeking to gain insights into peoples' behaviors, needs and values so as to provide meaningful and highly relevant solutions. These ideas do not just represent incremental changes to the status quo, but show an ability to see something from a completely new perspective.

The user-centric innovation start from understanding the potential customers. The ideal customer experience can be identified by identifying insights and subsequent opportunities. Business units use this information to go back to the technology and operations groups to help inform and direct them to what capabilities are required to deliver that ideal experience. This approach to innovation ensures the focus on what is wanted by customers instead of just what is provided. The design thinking manifesto always stresses the importance to maintain the focus on users' specific problems. In many cases, this is a real challenge, especially for inexperienced teams. Using various methods such as personas, customer journeys, storytelling or by changing the perspective, the facilitator supports the team in overcoming mental barriers and breaking typical patterns of thinking. The focus of innovation has shifted from engineering-driven to design-driven, from product-centric to customer-centric, and from marketing-focused to user-experience-focused.

However, according to former executives of Du Xiaoman, the user-centric innovation model was not that successful at Baidu Finance, due to the lack of individual consumer data, transaction records and credit standing. Baidu has been in the web-search business. Although the majority of its users are individuals, it only collects individual web browsing data which is more related to its search engine optimization business. Baidu has been facing challenges in drawing a complete individual consumer profile. There are simply too many missing pieces in the data attributes collected.

10.5.2 Regulatory Dialectics Reconciliation

Baidu Finance develops its awareness of regulatory changes through its financial institutional partners, investors and networks. For example, by collaborating with CITIC bank, Baidu gains knowledge on regulatory updates on regulations relating to banking, compliance and supervisory requirements. Baidu Finance also works with Tianjin and Nanjing bank consortiums such as "XinHe Finance Club" which consists of more than 100 commercial bank member units in Jiangsu and Zhejiang provinces. Through the banking networks, Baidu Finance gains insights into the provincial regulatory requirements and compliance focuses.

The legal, risk compliance and internal audit functions of Baidu Finance also attend regular briefing and consultation sessions organized by the authorities, such as PBOC and CBIRC. New measures, guidelines and FinTech requirements are discussed informally through these sessions. The legal and risk compliance teams also work very closely with the product development team to ensure that product features fully comply with the data privacy requirements.

PBOC has set up a FinTech committee to study and better understand the impact of the sector on financial markets, wider financial stability, monetary policies, and payments and clearing. PBOC's aim is to tighten control of China's FinTech industry. In addition to boosting FinTech research, the regulator is also increasing its own use of technology to improve supervision to keep up with the pace of change. It also wants to "guide" the use of technology in financial services and create new ways to manage innovation. But PBOC has emphasized that it wants to work alongside industry players. This suggests that any new rules introduced will be created with industry input, which should mean they are not overly onerous for legitimate firms, according to the Senior Product Manager.

There are many new regulatory measures issued by CBIRC and PBOC over the past five years, including practice guidelines, regulatory policies and compliance inspections for online lending, third-party payment, crowdfunding, Internet fund sales, Internet insurance and other FinTech areas. As a result, the core strategic focus of Baidu Finance is to maintain its advantages by cementing its pioneering roles in the FinTech space through technology-enabled innovation via Du Xiaoman and CITIC aiBank. "*We will focus on three key tasks. First, we continue to build our customer bases and drive innovation using insights derived from our massive data pools. Second, using this abundance of data and our insight-generating capabilities, we can identify opportunities for needs-based cross-selling of financial services products. Third, given the increasing complexity of the financial services industry, it is also crucial for us to keep*

augmenting our solid foundations of financial services knowledge through talent acquisition and partnership," said the Rick Control Manager.

In the area of risk control, Du Xiaoman is using online data in combination with central bank credit data, real-time data and conventional methods to greatly raise risk-control efficiency, while the company's facial recognition technology has achieved a success rate of over 98%, with a response time of just several dozen milliseconds. The company's commitment to pursuing opportunities in the FinTech area followed its USD 1.9 billion spinoff from parent company Baidu earlier this year, when it was better known as Baidu Financial Services Group (Baidu FSG). The company is currently cooperating with more than 500 financial institutions on new FinTech projects. Besides, it has launched an open consumer finance platform, a FinTech platform encompassing anti-fraud products, credit products and verification products, and an asset-backed securitization platform. "*We hope that our opening will bring profitability to our partners via financial cooperation and give impetus to our partners to continually renew themselves and innovate,*" said the Consumer Finance VP.

"*Baidu retained the top spot for AI patent applications in China because of our continuous research and investment in developing AI, as well as our strategic focus on patents. We continue to integrate AI technologies in our FinTech product offerings including face recognition, credit risk modeling and assessment, and robotic investment consultation. We will increase our investments into securing AI patents in FinTech and actively push forward the application of AI into more vertical industries*, *especially in the domain of financial services. We see a lot of opportunities to use AI to enhance service and product intelligence, improve user experience, and reduce operating costs and risks*," said the Chief Product Architect**. AI will lie at the core of upcoming FinTech innovations.** "*We believe that the application of AI in the financial sphere has already left the laboratory phase, and officially entered the standardized application phase*," added the Chief Product Architect.

"*We believe the best way to commercialize AI technology is to build ecosystems. Essentially, the purpose is to enable our partners to better accelerate their innovation and use healthy, stable economic models to build strong, long-term win-win for our developers and partners. The baseline is Baidu Brain [the term Baidu uses for all of its AI assets]. We have 60 different types of AI services in our suite we call Baidu Brain, and a key and rapid application of AI is in the social media, healthcare and financial service, for sure,*" said the COO.

AI-backed risk control tools were more powerful and could easily adapt to different application scenarios. In addition, the utilization of AI in finance also contributed to efficiency

improvement and cost reduction for financial institutions. After launching finance bots, for instance, Du Xiaoman saw constant improvement in the capabilities of customer acquisition, customer services and debt collection, while the labor costs dropped by more than 40%. AI technology also helped China CITIC Bank excel in making investment decisions. In 2019, the bank invested nearly RMB 5 billion (about USD 700 million) in technology development; Almost 6% of the bank's workforce were IT professionals. The bank uses image recognition, natural language processing and machine learning to gather and mine alternative data, which can help predict macroeconomic performance as well as industrial trends. For example, the bank has used language processing tools to index historical central bank statements, which, according to back-testing, can be very helpful when analyzing the fluctuations of consumer price index and interest rates. AI will be the driving force of infrastructure and the development of other key areas in the era of intelligent finance, said the Consumer Finance VP. Baidu offers its AI to Du Xiaoman and CITIC aiBank to help make them become intelligent financial services providers in China.

10.5.3 Financial Innovation Management

When asked about the innovation, business and people cultures at Baidu, the International Communication Director said, "*There are basically no hard-and-fast rules at Baidu aside from no smoking in the office buildings and no pets at work. There is no clocking in (we have flexible working hours), no dress code, nothing like that at all. We believe in hiring the best people we can find, giving them maximum personal space, and evaluating them based on their results. Exceptional talents at Baidu are given exceptionally free rein. You can roll in whenever you want (most people arrive between 10 a.m. and 11 a.m.) and no one keeps track of your time. At all our facilities there are nap rooms (at HQ, these include very nice massage chairs!) and people make liberal use of them. It is a very linear organization; no enclosed offices except for VP-level and above (and VPs are very few: about ten in an organization of over 20,000 people). Director-level employees work in the same open-plan half-walled cubicles as everyone else. Baidu is engineering-driven, and the unwritten rule is "The person who has the greatest tech prowess has the greatest say. PMs are also very much empowered at Baidu. We encourage a kind of combativeness, and you will often hear quite heated discussion as you walk by meeting rooms. A kind of "democratic centralism" is the rule, whereby there is free and open discussion until a decision is taken, at which point the focus is on throwing all efforts into executing the decision*."

In terms of actual innovation or creativity management, Baidu relies on two key principles "Simple and Reliable", the way Baidu describes its culture. "Simple" means direct and uncomplicated. "*We encourage candor to the point of tactlessness: No circumlocution, no fancy rhetoric, no beating around the bush. We address one another with no honorific titles (no "Director So-and-So" or "Vice President So-and-So") but rather with first names or nicknames. Office politics are taboo: The worst thing you can say about someone at Baidu is that they engage in that bullshit. The ideal Baidu-er is open, outspoken, self-confident, straight-forward, and willing to both challenge and be challenged,*" said the International Communication Director. "Reliable" means trustworthy, delivering tasks to the next team or person only when the job has been completed perfectly and completely, or at least until utmost efforts toward perfection have been made. Placing trust in the competence of co-workers and teamwork is emphasized in Baidu's work culture.

Baidu manages its innovation development activities centrally through Baidu Research centers in Silicon Valley, Seattle and Beijing. Baidu Research focuses on fundamental research in AI. It focuses on deep learning, computer vision, speech recognition, speech synthesis, natural language processing, data mining and knowledge discovery, business intelligence, artificial general intelligence, high performance computing, robotics and autonomous driving. It opened more than 90 core AI capabilities in voice, image, video, augmented reality, natural language processing, knowledge graph and data intelligence, among others. These are available to developers and partners through open APIs and software development kits (SDKs). Du Xiaoman and CITIC aiBank are getting the technology transfer and support from Baidu Research in Beijing.

For innovation performance indicators, Baidu is taking the following measures.

- Innovation investment – enterprise research and development investment, technology or patent acquisition.
- Innovation environment – innovation infrastructure, agile development teams, talent workforce, government grants/incentives.
- Innovation performance – patents registration, research and development output, research paper publication, new product sales revenue; user adoption; product life cycle.
- Innovation collaboration – scientific and technological cooperation, technology transfer to partners or open platforms, patent transfer or licensing.

In addition, Baidu has developed a sophisticated digital learning environment, drawing

participation from around 90% of employees. Established in 2007, the mobile learning platform focuses on skills, mindset and culture training. Leveraging its experience as a leading social communication and gaming company, Baidu positioned the platform with the philosophy to make training convenient, funny, short and continuous. Based on these concepts, Baidu has developed a large database of videos, each lasting no longer than 20 minutes, which describe the development of successful products like Baidu Wallet. There are live video classes led by popular instructors like the director of the TV program "Voice of China". Other skills are taught via games based on popular comics. The learning platform, in turn, analyzes the most popular courses and search queries, as well as user activities to improve the training experience and ensure it is creating value for employees in addition to keeping them up to date on the newest technologies and skills.

The Product Manager said that the online training programs have had a positive impact on product development and other business areas, and they have improved employee satisfaction and acted as an attraction for new recruits. Baidu is also looking to sell its new expertise in digital HR. Baidu's Talent Radar, a tool that uses big data and AI to identify hot spots for recruitment in any sector, has been marketed to third parties.

"*Other Chinese companies are looking at us not only in regard to our disruptive product offerings but also in relation to how we manage the workforce of the future. Moreover, we know all too well that their core competitive advantage lies in their talents. If they want to have a sustainable future, innovation learning and competency development are a necessity,"* said the VP.

Why did Baidu Finance fail to compete with MYbank and WeBank? In the informal discussions with Du Xiaoman's former CEO and former Operation Director, they admitted that **Baidu did not pay attention to user account development and data mining before 2016,** making it more difficult to deeply bind with users and more vulnerable to influences of the external environment. The weak development of the financial business within Baidu and the high reputation and policy risks brought by it made it **difficult for Baidu Finance to get enough attention within the group,** and the resources that could be mobilized and used by FSG were limited.

There were **many "external headhunted" executives in FSG, and it was relatively difficult to coordinate Baidu Group's native resources. In addition, the characteristics and logic of financial products were very different from those of Internet products.** There are many differences in the business logics, concepts, and cultures of employees between

financial/banking and Internet backgrounds. The process of cultural integration failed. Later on, due to the chaos in the Internet financial industry and regulatory rectification, the financial business brought a lot of negative impacts and pressure on public opinions to Baidu. In June 2017, Fitch and Moody's, two major international rating agencies, directly downgraded Baidu's rating and Baidu was included in the negative watch list due to concerns about the rapid expansion of its financial business. **Pressure from within and outside the group accelerated Baidu;s financial independence**. In July 2017, Lu Qi, then president and COO of Baidu Group, proposed to restructure FSG and operate Baidu Finance independently.

In April 2018, Baidu announced that FSG had completed the signing of the split financing agreement to achieve independent operation and it changed its name to Du Xiaoman Financial. Although it is not uncommon for a subsidiary to change its name after splitting its independence, Alipay's upgrade to Ant Financial is an example. **But for Du Xiaoman, whose foundation was still unstable, losing Baidu's label would only make its growth more difficult.** Only in many small details, it still revealed its attachment to Baidu, the traffic and influence that this brand could bring. On Du Xiaoman's official website, the introduction of "Rich Money" is: Credit Service Brand under Du Xiaoman Financial. But when it comes to advertising and traffic, its label is still "Baidu's credit service platform".

10.6 Summary: A User-centric Innovation Model

Based on the above analysis, it seems that Baidu Finance (both Du Xiaoman and CITIC aiBank) adopts a user-centric innovation model. User-centered innovation processes are very different from the traditional, manufacturer-centric model, in which products and services are developed by manufacturers in a closed way, with the manufacturers using patents, copyrights, and other protections to prevent imitators from free riding their innovation investments. In the manufacturer-centric model, a user's only role is to have needs, which manufacturers then identify and meet by designing and producing new products. This traditional model does fit some fields and conditions, especially in the fast-moving FinTech industry which is dominated by superior user experience.

Under the user-centric innovation model, Baidu Finance focuses on the user experience mapping instead of the product itself. Innovation is accelerated by taking the users experience in designing and creating the products and services they require. When expanded to the logical end point, a company — or ecosystem of companies — based on user-centric innovation will

decrease time and effort in the production of goods and services, and the goods and services will be "closer" to the needs of all users involved in the network of innovation. When done well, user-centric innovation enhances the user experience at every touch point and fuels the creation of products and services that deeply resonate with customers. To achieve this, an agile and customer/user-oriented team structure is required.

Here are some characteristics of team structure at Baidu Finance:

- Each of the product groups has a set of goals and possibly a profit and loss account that represents success. A roadmap is generally in place to meet those goals. OKR (Objectives & Key Results) is used to measure progress on a quarterly basis
- The teams are ostensibly autonomous and can make any important decision needed to meet their goals within the legal and compliance framework
- The "value to the customer" is part of the mission for each team. This codified using content such as MVP releases to ensure that developers keep end users' needs in mind.
- Teams are kept as small as possible, one, seven to 12 members for an agile team.
- Teams that do not work are shut down and the technology they created is distributed to other teams or discarded.

However, despite the right investment, people, process and tools, the failure or low return from Baidu Finance was attributed to the lack of consumer data and traffic. However, Baidu has proven that its AI technology can help banks reduce credit default rates, lower operational costs and identify the right customers. With that, there could be a change in Baidu's strategy in FinTech to **Become a Technology Vendor to Banks, instead of a FinTech firms by itself…**

Chapter 11: Cross-case Comparisons

As explained in Chapter 3 (Research Methods), a **multiple holistic case design** (Yin, 2009) is applied in this research for a firm-level of analysis of China's banking system. In this research setting, sets of cases are categorized into groups that share certain patterns or configurations Again, based on Eisenhardt (1989), comparative pairs of cases are selected and **grouped into two major banking models, namely, traditional banking and direct banking or FinTech**, and then **similarities and differences in the intra and inter groups are listed, compared and analyzed to identify key themes and patterns**. In addition, a maximum difference research design is used to select cases within each group. For example, in the traditional banking group, each bank is differentiated by ownership structure, length and size of operations. In the direct banking group (or FinTech), each firm has different core capabilities, user groups and level of support from the parent company. Common research questions (for example, what are the key innovation drivers? What innovation process or model is adopted by the case banks?) tie together the case studies. A cross-case analysis of these cases facilitates a greater understanding of the research issue (why and how financial innovation happen in China?). According to Eisenhardt (1989), multiple case study, in the range of six to ten cases, helps facilitate the comparison of commonalities and difference in the events, activities, and processes that are the units of analyses in case studies which can contribute to conditional generalizations.

Cross-case analysis can enhance a study's contribution to theories and methods, but there are questions about the generalizability of the conclusions emerging from the analysis and the ability of the researcher to justify any comparison beyond the set of cases studied. According to Yin (2009), in order to develop a stance on generalizability, there will be at least three practical concerns for cross-case comparison. First, sufficient contextualized details of the cases and findings of cross-case analysis are needed to preserve the uniqueness of a case and convey the value of their engagement with a cross-case analysis. Second, case study data are separated into units of meaning and regrouped into meaningful themes to enable exploration of relationships, observations and finding across cases. Lastly, the selections of cases, and their corresponding units of analysis, are important in cross-case comparisons and should relate to the overall goals of the research. For example, in this study, the contextual details of each case are preserved and analyzed to "connect the dots" between cases. Key themes are identified and extracted from the comparisons and mapped to the "thematic profile" of the case firm and the correspondence unit of analysis. Finally, the six cases are selected using a consistent research method to foster the predictability and idiographic or nomothetic generalizations.

This chapter provides a firm-level cross-case comparison of financial innovation process and model adopted in China's banking system. An explanatory approach is used to provide answers to "why and how" innovation and change process happens in China, which are the research questions and hypotheses raised in Chapter 2 (Literature Review). The case banks are mapped into Traditional Banks and Direct Banks. The following table summarizes the differences between these two groups.

Table 11-1: Traditional and Direct Banks Comparison

Domain	**Traditional Banks (Non-FinTech origin)**	**Direct or Branchless Banks (FinTech origin)**
Representing case banks	HSBC, CCB and Ping An (referred to as "Traditional Banks" collectively)	MYbank, WeBank, DUXIOAMAN and aiBank (referred to as "Direct Banks" collectively)
Physical presence	Have headquarters, as well as regional HQs, with branches located across the countries in which they operate	Have no local branches but are subject to cybersecurity risks.
Operating model	Operate their own branded local branches and ATMs for in-person customer service.	Operate only online services, anytime and anywhere, accessible primarily through smart/mobile phones.
Service model	Enjoy more trustworthy and implicit guarantee from the government.	Offer tailored, convenient, and scenario-based financing services with attractive rates.
Nature of product	Homogeneous products based on the banks' offerings and consumer's risk profiles	Tailored-made products based on customers' needs and profiles
Customer experience	Inconsistent services depending on human interactions and relationships	Consistent level of services, managed through digitalized user interface and experience

Source: The author's analysis

11.1 Answering the Research Questions

The objective of this research is to explore and understand the innovation process carried out by LCBs and FinTech firms in China using a pragmatic approach. The first section of this chapter attempts to answers the research questions raised in Chapter 1:

- **Innovation process**: What are the representative financial innovation processes or models in China? How are they different between LCBs and FinTech firms?
- **Regulatory dialectics**: How do commercial banks and FinTech firms manage and adapt to regulatory changes in China? What are the lesson learned?
- **Institutional change**: How was China's banking system transformed over the past 20 years? What are the roles and actions of institutional actors and agents in this process?

11.1.1 Innovation Process and Model

The case studies provide new insights into the organizations and activities of the financial innovation process. **The empirical data from case studies indicate that the financial innovation processes/projects are organized very similarly across the case banks, although traditional banks have a more formalized procedure compared to direct banks.** For example, Traditional Banks generally start the development process with a formal and comprehensive business case approved by Product Development Committee before resources are pulled together for the development work. Direct Banks, on the other hand, start with a mini and informal request for Proof of Concept (POC) which generally consume very little resources and can put together a quick feasibility study conclusion of go or not-go in a short time frame (two to four weeks). Depending on the POC result, a formal business case will be put together using product, market, financial and regulatory sandbox data collected from the POC.

Vermeulen (2004) found that the financial product innovation process adopted by UK banks generally encompasses four key phases of project management: ideation, conceptualization, construction, and implementation. **There is also a generic financial innovation process adopted across Traditional Banks and Direct Banks in China, which can be grouped into four key phases of Idea Generation, Concept Development, Product Building, and Innovation Diffusion.** First, in term of innovation organization, all the case banks use a multidisciplinary project team to develop new products. The project team mainly

consist of subject-matter experts from various departments. The team is formed after the management approves the initial idea. The project team members are generally involved on a part-time basis and act as representatives from their functional departments. The project manager is usually a full-time member from the product innovation department. The project manager will spearhead the proof-of-concept, lead innovation development activities, coordinate resources and promote innovation outcome marketing. Second, in term of innovation activities, the product innovation process encompasses such key phases as idea generation, concept development, product building, and innovation diffusion. These phases were conducted sequentially and partly in parallel.

- **Idea generation:** Larger commercial banks (such as HSBC and CCB) have formalized procedures and organizations (such as innovation laboratory) to generate new ideas. Smaller and young banks (such as Ping An and MYbank) collect new product ideas from front-liners and customers. Management team screens the new ideas, and, after approval, a project team will be formed to further transform the idea into a new product.

- **Concept development:** The development process is concerned with specifying the product features. These product specifications are lengthy descriptions of what the product is and does, what it is not and does not do. This stage is very important because the product specifications are the basis for subsequent IT development and financial modelling.

- **Product building:** Project team members communicate electronically (email, conference call and WeChat) to exchange information and coordinate activities. Formal meetings are organized by the project manager to check development milestones and product validation. External parties (such as consultants, industry experts, regulators and key customers) may involve in the product development or testing stage by invitation.

- **Innovation diffusion:** Diffusion involves the introduction of the innovation to the distribution channels and the instruction to personnel and intermediaries for new product marketing and usages. Post-implementation product/market performance data are collected and analyzed to evaluate the innovation success. Project team is dissolved after the new product successfully go live. Further enhancement and maintenance work is handed over to the operation team.

Most researchers agree that the innovation process proliferates into complex bundles of innovation ideas and divergent paths of activities in different organizational units. Based on the case studies, the innovation process adopted by Chinese banks shows a variety of models and interesting themes.

Table 11-2: A comparison of innovation approaches and processes

Comparison	Commonalities	Differences
Innovation Approach	A multidisciplinary team using a project management approach	HSBC: International connectivity CCB: Government policy implementation Ping An: Business and client synergies MYbank: First to market and industry disruptor WeBank: An open platform with API integration Du Xiaoman/aiBank: Technology enabled from Baidu
Innovation Process	A generic process consisting of ideation, conceptualization, evaluation, development, testing and diffusion	HSBC: A globally consistent process CCB: A top-down process Ping An: A concurrent and integrative process MYbank: An agile and situational process WeBank: An open and micro-innovation process Du Xiaoman/aiBank: A user-centric innovation process

Based on the case studies, Chinese banks use a multidisciplinary project team to develop financial innovations. The project manager and core team members are usually full-time staff from the function(s) responsible for leading the innovation process. Representatives and subject-matter experts from other supporting functions are involved as needed. In the innovation process, HSBC emphasizes the ability to gain adequate market insights, identify key customer segments and develop customer segment-based solutions. To leverage global innovation competencies, a consistent innovation approach with minor adaptations for local regulatory compliance is applied at HSBC. CCB focuses on comprehensive requirements collection, alignment with government policy and the bank's market proposition. For CCB, it is important to support government policy implementation and fulfil its social responsibilities as a state-owned bank. Ping An focuses on an integrated solution approach for its insurance, banking and asset management businesses. The integrated approach helps Ping An develop innovative solutions that can maximize its business and client synergies in the value chain. MYbank prioritizes speed-to-market and continued product enhancement. For MYbank, it is important to the "First to Market" and quickly establish a critical mass of user base. Using FinTech to solve consumer and industry pain points enables MYbank to continue being a highly

innovative firm and industry disruptor in China. WeBank focuses on its "3O" open banking model (open platform, open innovation and open collaboration). For WeBank, it is key to establish a WETech ecosystem with traditional banks and other technologies firms so that data and information can be exchanged across organizational boundaries to benefit the whole financial community. Finally, Du Xiaoman/aiBank focuses on technology input from Baidu to drive its FinTech advancements. For Du Xiaoman/aiBank, it is important to collaborate with related companies and other technology firms to secure financial user information and transactional records.

Based on the above findings, it seems that a bank's innovation approach is largely influenced by its ownership, organizational culture and operation priorities. However, a multidisciplinary project team and organizational complexity also lead to inefficiencies such as inter-team conflict of interests, excessive communication to align objectives and tasks, overlapping duties and unclear responsibilities, and complexity in managing relationships and coordinating work. "*Sometimes we spend too much time talking, instead of getting the work done,*" said the product manager. This study finds that functional diversity facilitates a more open innovation process with integration of knowledge from different functional disciplines, whereas functional similarity facilitates an in-depth innovation process where competence in a deep sense within a single or limited discipline enhances knowledge breakthrough.

From the case studies, it is shown that CCB and HSBC are more risk-adverse and conservative when dealing with innovation. Mangers in HSBC and CCB display risk-avoiding behavior, with risk-taking considered unwise. These managers avoid taking risks to protect their jobs. Bureaucracy and a hierarchical decision-making process result in managers being afraid of making mistakes that may lead to political scapegoating. They err on the side of caution, being more stringent and adding extra scrutiny measures to the innovation process. As a result, the approval process becomes more complicated and lengthier. The additional control requirements lead to the innovation losing some of the flexibility and user-friendliness of the original proposal. Some of these controls are not necessary to protect financial consumers. For example, HSBC establishes an innovation network with multiple levels, and different clusters come together as a whole. HSBC leverages its international connectivity and global competency in innovation learning and deployment. Actions taken by domestic actors include implementing consistent business models, re-engineering global functions and processes, and streamlining the IT platform for effective diffusion in the local market. Greater alignment is needed to ensure global or regional consistency to NPD. CCB, on the other hand, has a bureaucratic and hierarchical organizational structure that supports a rational decision-making process. Pro-

government policy, centralized, top-down control and conservatism are dominant and embedded in the organizational culture of SOEs like CCB. To enable a top-down innovation process, it is important to develop an innovation strategy and roadmap, policy and procedures and broadly communicate them to the entire bank. What is interesting at Ping An is an integrated business model that emphasizes a total business concept for customers, services, distribution and product integration. Innovation at Ping An entails cross-disciplinary action and high levels of integration at both intra- and inter-firm level, through open innovation with external partners, alliances and vendors. The overall objective is to build an integrated finance business ecosystem by leveraging Ping An's large customer base in the insurance business.

Therefore, we can say that innovation is a dynamic system that responds to severe market challenges and regulatory constraints or pressure. Innovation is a continuous change management process which is often messy and chaotic, striving to succeed amidst the complex silos in financial institutions. A successful financial innovation process encompasses a myriad of strategic and operational changes, involving modifications to processes, technologies, workflows, distribution channels and service deliveries. For example, financial innovations largely depend on ICT for development, discourse and delivery. Product concepts that seem promising but cannot be developed without major changes in information systems become an innovation constraint. For example, CCB's legacy IT system constrained its innovation capability. It failed to meet the business needs of the new Internet finance regime. In 2015, CCB carried out a major upgrading of its banking system to provide mobile technology-enabled e-banking and self-service offerings.

Due to the ownership, structure, operation model, form and size variances, institutions face different degree of regulative duties and adopt different innovation models in the NPD process.

Foreign banks (such as HSBC) are faced with the paradox between home country practices and host country compliance requirements. The reconciliation takes different forms of institutional integration model – absorption, symbiosis and preservation. The innovation model adopted is global template or standard with limited local variation for laws and compliance. Regulation is perceived as boundary and rules of the game.

State-owned banks (such as CCB) have fiduciary duties to promote and support government policies which will overwrite their financial performance obligations. The innovation model adopted is structural, conservative and pro-regulation. Regulation is perceived as both a protection of the status quo and a constraint to innovation.

Private-owned banks (such as HSBC) have limited resources and capabilities to innovate

due to capital, market shares and size constraints. Key objectives are to survive, compete and specialize to become more risk resistant. The innovation model adopted is experimental, concurrent and collaborative – to pilot success or failure fast. Regulation is perceived as the opportunities to identify gaps and take advantages.

FinTech firms (such as MYbank, WeBank, Du Xiaoman and aiBank) attempt to redefine the institutional arrangement by integrating technology, user experience and financial services to provide a new form of service delivery and consumer interaction. They engage actively in institutional design and diffusion activities. The innovation model adopted is explorative, agile and technology-oriented. Regulation is perceived as greenfield creation and/or brownfield modification.

The case studies suggest that there is no one-size-fits-all innovation model. The innovation process is specific to business strategy and organizational trajectory. Therefore, firms need to diligently select and adopt an innovation process that matches their operating environment, innovation maturity, organizational structure and behavior. As our three banks have different ownership regimes, we could at this point have the impression that ownership dictates the nature of the innovation process. However, things seem to be a bit more complicated. The bank ownership structure strongly influences innovation strategy, approach and process. An innovation strategy that has a strong relationship with the state can offer protection and influence competitive intensity. Finally, regulatory and economic conditions may also influence the incentives for innovation. Lack of patent protection has also resulted in banks not being motivated to invest in product innovation. Instead, process innovation can create a more sustainable comparative advantage for banks. Most financial innovation activities are conducted sequentially, though some activities can run in parallel.

Most researchers also seem to agree that the innovation process proliferates into complex bundles of innovation ideas and divergent paths of activities by different organizational units. For example, HSBC's actor-network model is dominated by intra-organizational behavior, CCB's layered model is dominated by hierarchical and functional authority, and Ping An's concurrent model is dominated by parallel and collaboration culture. The common characteristics in Traditional Banks' innovation model are long-term, major and discrete, product-centric, hierarchical, process-driven, risk avoidant, and approval-oriented. In comparison, the dominant characteristics at Direct Banks are very different. For example, MYbank's agile model is dominated by speed-to-market, WeBank's micro-innovation model is dominated by continued product enhancement, while Du Xiaoman & aiBank's AI-driven model is centered around using AI Technology to enhance automation and smart decision. The

common characteristics in Direct Banks' innovation model are short-term, small and continuous, user-centric, flat and equal, product-driven, risk-taking and value-oriented. The word "dominant" expresses that certain characteristics of these models are at the forefront in each case bank, but it does not mean that the other elements are not present. For example, Although HSBC has an actor-network and client interaction dominant model, creativity, collaboration and efficiency are also present in HSBC's network model.

Table 11-3: Generic innovation characteristics: Traditional Banks Vs. Direct Banks

Innovation Characteristics	**Traditional Banks**	**Direct Banks**
Innovation development and usage time cycle	Long-term	Short-term
Innovation size and mode	Major and discrete	Small and continuous
Innovation focus	Product-centric	User-centric
Innovation organization and governance	Hierarchical	Flat and equal
Innovation orientation or initialization	Process-driven	Product-driven
Risk attitude/appetite	Risk avoidant	Risk-taking
Innovation processing	Approval-oriented	Value-oriented
Innovation evaluation	Reusability, scalability and stability	Speed-to-market, creativity and user adoption rate
Innovation diffusion	Online and offline	Online

Source: Author's analysis

Summary

The above analysis shows that innovation is not a fancy engagement but a dynamic system that responds to severe market challenges and regulatory constraints or pressure. Innovation is a continuously changing management process which is often messy and chaotic, striving to succeed amidst the complex silos in financial institutions. Successful financial innovation process encompasses a myriad of strategic and operational changes, involving processes and technology, workflows, changes in network distribution and service delivery. Most importantly,

there is no “one-size-fits-all” innovation process. Firms need to diligently select and adopt an innovation process that matches their operating environment, innovation maturity, organizational structure and behavior.

Based on the case studies, **it seems that (1) financial innovation follows a generic innovation process of idea generation, concept development, product building, and innovation diffusion; (2) LCBs tend to follow a more formalized innovation process and procedure; (3) concept development is a critical step in financial innovation and most product concepts tend to mimic and build on existing products; (4) lack of patent protection may cause banks to lack the motivation to invest in product innovation. Instead, process innovation can create a more sustaining comparative advantage to banks; and (5) financial innovation activities are conducted sequentially and partly in parallel.**

The next section aims to review how the case study banks reconcile their regulatory dialectics in the promotion of financial innovation development.

11.1.2 Regulatory Dialectics Reconciliation

The relationship between financial innovation and regulation is complex. Kane (1977) introduced the regulatory dialectic concept. Basically, financial institutions resort to financial innovations to avoid strict regulations affecting their profitability. In turn, the authorities introduce other rules in response to the financial institutions action and this “game” is endless. How do banks reconcile the regulatory dialectics in the Chinese banking environment? Based on the empirical data collected from the within-case analysis, regulatory compliance processes are compared in terms of knowledge, response and implications on the firm’s innovation strategies and processes. The objective is to review the generic and specific strategies adopted by each firm in reconciling the dialectics between innovation and compliance.

Based on the case studies, it seems that each bank undertakes a different approach to reconcile regulatory dialectics. HSBC adopts a “trusted foreign friend approach” to financial innovation in China. First, it studies the regulatory direction and government policy trend in China. Based on this policy scanning and analysis, it identifies opportunities to bring new products/services to the Chinese market. HSBC has strong ties with local governments and in many cases develop new products to support the local governments’ fiscal/monetary policies such as the issuance of dim sum bond in response to the Renminbi internationalization initiative. In all cases, HSBC shares best overseas practices with regulators and informally ascertain the

policy direction and regulators' opinions on HSBC's new products/services. The objective is to design new or customize existing products to support government policies. Taking this opportunity, HSBC emphasizes some challenges that need policy support from regulators to overcome. HSBC maintains continued and regular dialogues with regulators to sense the "political direction" and continues to identify new opportunities. This approach provides a "safety net" to HSBC when it comes to policy uncertainty. It also helps strengthen HSBC's relationship with regulators as a "reliable foreign friend" and also a "window to the outside world". However, this approach requires significant amount of investment in time and efforts to "entertain" some regulators' quick call for action and support. This approach is suitable for HSBC as it has a long-standing relationship with Chinese government and has been in this playing field for a long time. So, HSBC knows when to say "yes" and when to "politely reject" some requests.

CCB applies a "subordinate approach" to financial innovation in China. First, it studies the existing peers' products in the market. The objective is not to be an "innovation leader", but to ensure its product is overall competitive in the market. Although an innovative product gives the bank comparative advantages, it is always risky and uncertain in radical innovation. Financial innovation product is homogenous and easy to copy. Therefore, CCB tends to replicate and enhance products from other banks. What is important to CCB is not aggressive innovation but to support government policy in lending and stimulating economic growth. In certain cases, CCB may lobby regulators for preferred treatments or special policy support. As a SOE bank, CCB has the advantage of closed and informal dialogues with regulators. CCB continues to identify opportunities in the market and tailor innovation to government policy requirements. This approach provides a "comfort zone" for CCB to operate with strong support from regulators and government. It helps the bank and its management team to align goal and score a "good performance scorecards" from governmental annual performance appraisal. However, this approach may reduce the firm's profitability and innovation capability to a secondary status. This may harm the bank's long-term sustainable development ability, especially when Chinese economy is reducing the GDP growth rate. Some inherent operations inefficiencies and bad debts may start surfacing. This approach is suitable for CCB as it has a government controlled and majority-owned bank. So, as long as it still remains in the SOE ranking, the bank continues to be safe and comfortable as a subordinate.

Ping An engages an "innovative approach" to financial innovation in China. First, it develops an integrated finance offering framework based on its business coverage and innovation capability. To support its mission for integrated finance platform, it has established

a risk management system that allows near-real time collection and analysis of risk data. It scans the business environment to identify opportunities for bundling services to its combined insurance, bank, investment and security customer segments. The new/bundling services may be a grey area or a loophole in the current regulations. It cautiously shares the innovation ideas with regulators to test the water. New and customized products are developed to support government policy. At the right time, it brings to light the issues of POE banks to government and request for preferred treatments/policy supports from regulators. It continues to engage healthy dialogues with regulators and to identify new opportunities. This approach provides a "growing ground" to Ping An along with the deepening of financial reform in China whereby POE banks are given more opportunities to grow bigger to serve the financial needs of the public. The advantage of this approach is "top-down design", "technology-driven" and "trail-and-adjust". However, this approach walks a fine line between innovation and compliance. It may cross-the-line if the rights of financial customers are at risk. This approach is suitable for Ping An as it provides a home ground to grow and compete with LCBs.

Direct Bank such as MYbank use a "disruptive and then mild" approach to financial innovation in China. First, it leverages on the advantage of its online purchase platform and third-party payment license to launch an online monetary funds. Because it offered a rate higher than bank deposit rate, the online monetary fund quickly grew big in a short period of time. Traditional banks were worried and complained to the regulators. Closed door dialogues were held, and actions taken to "sun shine" the unregulated online-banking activities. As a result, MYbank was given a private banking license to offer micro-loans to online SMEs and consumers. MYbank is now under the radar and governance of regulators. MYbank actively attracts traditional banking talents and experts to beef up its risk modelling and control capability. It starts to align service/product offerings with government policy and engage in "mild" innovation. When dealing with invention, it carefully checks the regulators' opinions and sometimes may also request preferential treatments/policy support from regulators. It engages in continued dialogues with regulators and actively identifies opportunities in the service gaps. The approach starts with a high-impact disruptive innovation kick-off to attract regulators' attention to open door for private online banking. It is risky and obviously very successful. However, this approach cannot be generalized because it depends on the specific business context, consumer reactions and economic conditions. This approach is suitable for Direct Bank in this specific context when the traditional banks monopoly can only be disrupted by disruptive innovation and innovative business models. Meanwhile, the government is supportive of the institutional field change.

Summary

The key challenge for regulators is to strike a balance between regulation and innovation - to encourage and manage financial market development without stifling innovation. The basic assumption is that innovators continuously crack regulatory loopholes to innovate, whereas regulators fix the dodge and close the gaps by tightening the regulations. Based on Kane's (1977) regulatory dialectic, banks always search new modalities to circumvent the regulations that affect their profitability. However, this phenomenon is not seen in the Chinese banking system. Instead, the generic model of balance between innovation and regulation in China is: Banks operating in China proactively share innovation ideas with regulators (to test the water) and actively align new/customized products to support government policies. They also cautiously request preferential treatments/policy support from regulators to strengthen their competitive advantages. All banks intend to engage in continued dialogues with regulators to understand the regulatory policy change and direction. They continue to identify opportunities as part of the environment scanning exercises.

11.1.3 Financial Innovation Management

How is financial innovation managed and appraised? Based on the case studies, different types of financial innovation management methods/approaches are identified within each bank. In term of institutional arrangement, it seems that HSBC leverages on the group centralized team to govern the whole innovation process, based on the strategy of "using, customizing or building" from global product into local product. CCB establishes innovation department at HQ and Board Committee to drive top-down innovation. Ping An sets up an innovation committee at group level to coordinate innovation initiatives, with innovation development and diffusion decentralized at subsidiaries and affiliates. MYbank has set up two work committees to review and approve innovation, but the whole innovation process is bottom-up, driven by product team. Both WeBank and Du Xiaoman manage the innovation process through setting up FBG. FBG has several product divisions or lines of business (such as consumer financing, retail financing and wealth management), which will specialize and be responsible for their respective fields on product ideation, development, testing, approval and launching. Legal, compliance and finance departments are shared services to provide support to the product team.

Based on the empirical data from the case studies, centralized innovation development, generally adopted by Traditional Banks, helps increase cross-market product consistency, lower

development and diffusion cost, improve compliance and risk governance control, and most importantly, instill long-term product upgrade roadmap. However, centralized development has the limitations of inadequate consideration for local market requirements, inability to meet various diversified regulatory environment, and failure to capitalize on domestic market opportunities. Centralized model is suitable for LCBs, diversified banking operations, top-down innovation drives and power-concentrated organizational structure.

In comparison, decentralized innovation development, generally adopted by Direct Banks, encourages knowledge sharing at work, engages front-liners and customers in the innovation development process, builds for specific customers and market segments, and most notably increases local buy-in on the new inventions. However, decentralized development, in most cases, tends to reinvent the wheel, fails to leverage on talents, technologies, solutions within the group, and incurs higher development costs and compliance risks. Decentralize model is suitable for young and small commercial banks, specialized banking operations, bottom-up innovation drives and power-distributed organizational structure. There is literature suggesting that decentralized model tends to be more pro-innovative than the centralized one.

Micro regulatory, normative and cultural-cognitive forces are clearly interwoven and reinforce themselves to shape two distinct organisational templates, one ‘business as usual’ and one ‘innovation’. For example, MYbank and WeBank started their operations in 2014/15. Within a short operating period of 18 months, they had issued millions of loans to millions of SMEs using automated credit modeling and loan services. They also started to build up their liability side (deposit) of the balance sheet by offering higher than market rate monetary funds. The regulatory environment was also on their side by allowing innovative QR code payments, non-bank individual money transfers and link to bank accounts. This collectively resulted in losing deposits, consumer traffic and reduced revenue/profits at the Traditional Banks, which in turn forced them to innovate and improve customer service. Successful institutional changes are normally dominated by an “innovation template” (Vermeulen, 2004)

In term of communication flows, it seems that both HSBC and CCB are vertical-oriented while Ping An and all the Direct Banks are horizontal-oriented. This can be explained by the innovation review and approval process inherited in the banks concerned. HSBC adopts a centralized approach and CCB uses a top-down development approach. These approaches require significant amount of communication between the central/HQ team and the innovation/local team on innovation needs, approval, testing and diffusion. Ping An applies co-development and concurrent processing across departments, affiliates and development teams. This method requires a massive amount of communication to address intragroup collaboration

issues and potential conflicts of interests. The Direct Banks employ a project management approach for rapid application development. This approach involves constant communication among functional teams and project members. Cross-platform coordination is also needed for innovation deployment. Horizontal communication flows improve trust and relationship which eventually help reduce resources and organizational uncertainties. Whereas vertical communication flows and co-development promote "out-of-box" solutions through cross-fertilization which eventually helps develop a pro-innovation organizational culture and grounded innovation. These communication flows findings are consistent with the existing literature.

According to Vermeulen (2004), if innovation originates from multidisciplinary work groups, but most of the work is conducted in mono-disciplinary teams, the vertical communication flows prevail. If the work requires a high level of contribution and coordination from multiple teams, and most of the work is co-developed, the horizontal communication flows prevail. In addition, the participants indicate that it is easier to generate innovative ideas when employees with different backgrounds and different experiences are put together. Besides, effective external communication can also help companies better understand customers' needs and market development trends. Good communication is based on open and transparent information. In addition to emphasizing transparency of the assessment process, companies should also encourage sharing of knowledge and experience among staff.

In term of innovation appraisal system and measurements, it seems that all the case banks have established a systematic innovation performance assessment framework. An assessment of individual innovation performance provides a means to continuously innovate. To support the post-mortem review of innovation performance, all banks have developed management information systems that allow intelligent data mining on the product performance, prospects and related sales. In addition, all the banks also developed a set of fair assessment criteria and reward outperformers with both financial and nonfinancial incentives. Banks regularly assess their innovation programs to ensure they are efficient and effective, and to prevent good innovation programs from being unexpectedly suspended. Specifically, innovation performance appraisal criteria used at HSBC are specific, measurable, and mostly financial-oriented. CCB uses a more descriptive-based appraisal system, considering both monetary and non-monetary performance of the invention. Ping An applies some performance-based criteria and focuses on cross-selling results. Finally, Direct Banks make use of big-data analytics and cloud computing for their innovation performance review. Direct Banks (such as WeBank and MYbank) recognize and reward individual contributions to innovation by providing intrapreneurship

funding and invention copyright. Intrapreneurship is a system which allows an employee to act like an entrepreneur within an organization. Intrapreneurs are self-motivated, proactive, and action-oriented people who have leadership skills and think outside the box.

Summary

Many banks do see the necessity of having a formal innovation strategy or a dedicated innovation department. However, the relation between fixed structures and innovativeness is weak. No clear evidence indicates that formalized structures will lead to higher quality of innovation work products, notwithstanding that formalized structures help reduce procedural and resources uncertainty, which in turn lower communication costs and time. The communication flows orientation (vertical or horizontal) is depending on the direction of information sharing and co-development. Lastly, effective innovation evaluation and rewarding systems are essential to the continued healthy development of innovation routines.

11.1.4 Innovation Learning and Competency Development

Organizations need to learn to preserve and anticipate major technological, competitive and customer trends. Organizational learning is vital to the survival of the organization and critical especially during innovation as it steers the transformation of technological and market information into market-demanded outcomes. How is innovation learned and competency developed in an organization? Based on the case studies, innovation learning and competency development undertake different routes in each case bank.

Across the case banks, **"Project learning"** stands out as the key method for financial innovation competency learning or development. HSBC adopts a multidisciplinary collaborative project team method for innovation development. Functional and subject matter experts are combined in a taskforce to share knowledge and ideas during the entire development process. Team members not only learn (and solve) development concerns and market dynamics from intragroup exchanges, but also contribute to improving the innovation development process. Lessons are learned, and project manuscripts are documented and shared with other teams. The diversity allows individuals to make "novel associations and linkages". They therefore encourage the hiring of diverse teams to have a variety of individuals working together and exposing themselves to other ways of looking at things. However, managing a multidisciplinary team comes with the challenges of cross-cultural issues, different time zones and language barriers. Project manager needs to have high caliber to handle trajectory and role

conflicts. This type pf project management approach is suitable for HQ power-centralized and formal organizational structure with established protocol for teamwork. As a lot of literature indicates, organizational diversity increases as the number of various specialists in an organization proliferates. This heterogeneity leads to a better stimulation of new ideas and the specialists can gain new insights from different perspectives (Hargrave and Van de Ven's, 2006). Multidisciplinary teamwork leads to varied interpretations and therefore a higher elaborateness of learning is developed that changes the range of potential behavior. However, communication complexity increases together with larger organizational/team diversity.

CCB applies a similar project learning method but it is basically top-down driven in terms of knowledge sharing and exchange. The HQ team decides on the project team structure, members and working method. Key project members are functional representatives at HQ. Some project team members are selected from branches to ensure "boots on the ground" and "customer voices" are included in the new development. Although the top-down project is easy to manage, team members on the ground may have low morale due to limited involvement in the decision-making process. Also, the innovation may be "diverted and off-track" as the HQ development may sometimes "lock themselves in the room" and fail to listen to the ground crews when the market conditions or customer business needs change. This kind of project management approach is suitable for bureaucratic and hierarchical organizational structure with clear/implicit reporting line procedures in place. Since innovation ideas/initiatives are HQ-dependent and central at top, the success of top-down project management approach is affected by the degree of coordinative communication effectiveness. Coordinative communication helps integrate experts with different knowledge focuses into an innovation team. It also helps reduce task uncertainty in the management of development projects which include clarity in that who owns the project will lead to intraorganizational conflicts and coordination problems. Coordinative communication mainly attempts at the exchange of information. Consequently, coordinative communication is needed to facilitate effective learning in top-down innovation project management (Vermeulen, 2004).

Ping An uses an intragroup cross-functional collaborative innovation method. The "project owner" department/entity identifies co-development needs and solicits with the "project co-owner/supporter" department/entity to develop the ideas and form a project team. Project manager is usually selected form the "project owner" department/entity. Co-project manager may happen if more than one department/entity have equity importance to the project. Co-owned and cross-platform project management requires high communication costs in knowledge sharing, conflict resolution and project activity coordination. Although there are

challenges and limitations in co-development, the benefits are significant, including integration of intragroup recourses (technology, people, process and customer) to maximize cross-selling and offer bundled services to market. Co-development with internal and external support may result in breakthroughs/radical innovations which may not be possible without cross-boundary knowledge sharing. Of course, the challenge will be to determine the proprietary and income stream rights among the co-developers. This form of project management approach is suitable for power-decentralized and performance-based organizational structure with separated performance scorecards. In the co-development project, both creative thinking and task/responsibility coordination are paramount to the success of innovation development. Innovative communication is commonly used in the planning stage whereas coordinative communication is more prevailing in the development and launch stage. Innovative communication involves creativity in problem solving leading to new idea generation and should act as a stimulus for new service development and innovation co-development. At Ping An, for example, co-developers become sensitive to creative thinking. They integrate capabilities from different parts and combine resources and knowhow to develop cohesive and amalgamated solutions to the current problems, which results in innovative and breakthrough solutions that go beyond individual development capabilities. Also, as the project innovation team learns more about its counterparts' capabilities and products during the innovation development process, these new insights can be exploited when dealing with customers for cross-selling opportunities. Consequently, cross-selling is another benefit of project learning as the innovation team obtains more expertise (Vermeulen, 2004).

Direct Banks generally employ a product manager-centered project management method. The role of product manager (acts as project manager) spans the entire development process and cycle, from idea generation, resources coordination, product promotion, testing, deployment, and continuous improvements/upgrade. The product manager needs to communicate and coordinate the innovation development cross-functional and cross-organizations. Key advantages of this method include institutional entrepreneurship, with benefits of strong motivation and involvement from team members, agility and speed to adjust to business environment changes, and customer-centric product development where user experiences and interfaces are prioritized. The limitation is the individual-dependent project direction and outcome. Innovation can be costly and in the wrong direction if the product manager is not capable or has goals incongruent with the firm. Therefore, Direct Banks establish two work committees to monitor the project path, outcome and risks on a regular basis. This kind of participative and intra entrepreneurship project management approach is suitable for

new and young technology/Internet-based start-ups such as WeBank, MYbank and aiBank where organizational burden is less. Participative decision-making leads to a higher motivation to learn. Self and intragroup learning will enable the team members to perform better in the future as their personal knowledge base broadens and eventually higher self-efficacy and accomplishment (Hargrave and Van de Ven's, 2006).

Two common success factors in project learning are identified from the case studies: **Top Management Support** and **Cross-functional Interfaces**. Management support has a strong influence on the project learning effectiveness during the product development process as evidenced from HSBC, Ping An and MYbank. Senior Management at these banks can effectively conceptualize their cognitive thinking into actionable innovation strategy and product roadmap. Management support shows the importance of knowledge exchange within the innovation project and the firm (within the group). It creates an internal environment that stimulates organizational learning, knowledge sharing and cooperative culture such as innovation incentives, recognitions and the horse racing program. In large firms like HSBC, Ping An and CCB, different functional units must work together, and cross-functional interfaces must be established for integrated financial innovation. Cross-functional interfaces lead to higher thoroughness of learning as the different functional group members develop a shared interpretation. Cross-functional interfaces can stimulate creativity, expand the knowledge horizons, and reduce barriers between the functions (Vermeulen, 2004). Almost all the participants from the case studies agree that project learning can help build a knowledge base to facilitate problems solving after innovation diffusion. Learning from the experience of innovation, team members can help improve the quality and speed of problem solving.

Summary

Innovation learning and competency development in China's banking system are carried out primarily through project learning which involves information processing activities that build up a knowledge base. Innovation managers (product or project managers) within banks actively manage organizational learning during the innovation process. Innovative communication plays a crucial role in steering learning during the planning stage, whereas coordinative communication dominates the development and launch stages. Firms should create an organizational setting that facilitates and encourages organizational and project learning behavior. Major prerequisites are top management support and cross-functional interfaces that facilitate learning and knowledge sharing in the innovation project. Organizational diversity is another important factor as different specialists can exchange their expertise. When recruiting personnel, innovation managers should select employees with different backgrounds and skills

so that other employees can benefit from their knowledge. Involving people from different departments in one project opens boundaries that lead to a stimulating work atmosphere. Through participating in the innovation decision-making process, team members can achieve self-fulfillment and are more satisfied. Decisions that are worked out together are more easily implemented as team supports the decision. These activities are essential in an innovative setting, and service innovations are indispensable in the dynamic financial service environment.

11.2 Institutional Change in China's Banking System

As descried in Chapter 2 (Literatures Review), the prime theory for this study is Institutional Change theory, which can be categorized into four distinct perspectives of institutional design, institutional adaptation, institutional diffusion, and collective action (Hargrave and Van de Ven, 2006). **Institutional design** focuses on the purposeful creation or revision of institutions to address conflicts or social injustices. **Institutional adaptation** seeks to explain how and why organizations conform to forces in the institutional environment. **Institutional diffusion** focuses on how and why specific institutional environments are adopted (selected) and diffused (retained) in a population. **Collective action** focuses on processes of institutional change at the interorganizational field level.

This section will examine the key actors in China's banking system and how they drive changes in the institutional arrangements. We also investigate the roles of regulation and innovation in the institutional change process. Based on a few stories, we relate the observations in China's banking system to institutional change theory and provide explanations.

11.2.1 Major Events and Key Institutional Change Actors in China's Banking System

China's banking system experienced some major changes during the period from 2010 to 2010, notably due to macro-economic turbulence, financial regulatory liberalization and socio-economic advancements. Some key events in the last decade and their implications are summarized in Table 11-4 below.

Table 11-4: A summary of the changes in institutional arrangement (2010-2020)

Changes in institutional arrangement	Implications
The surge in P2P online lending. P2P lending surged from RMB 130 million (12 platforms) to RMB 300 billion (2,000 platforms) from 2010 to 2015. The return from P2P lending decreased from a height of 25~30% to 10~15% in the same period. By the end of 2015, a total of 420 P2P platforms had been closed with billions of funds embezzled.	P2P lending has the potential to alleviate SMEs' chronic funding difficulties. The lack of regulatory governance on FinTech firms resulted in widespread misappropriation of investors' funds. The low entry barriers and lack of regulatory governance are the major issues in P2P lending. P2P lending circumvented the PBOC restrictions on bank lending to finance local government and real estate development projects.
Mobile payment surge. By the end of June 2014, the number of mobile payment users had increased to 292 million, of which about 200 million were making mobile payments. According to PBOC, as of February 2014, there had been a total of 269 licensed third-party payment institutions, 90% of which supported mobile payment, representing a 60% YoY increase.	Mobile payment services were offered for not only merchandize or service purchases but also public utility, traffic fines and credit card payments. The traditional bank remittance service and deposits were to a certain extent adversely affected by these mobile payment services.
Online financial products distribution surge. In 2013, Internet companies began to distribute their own MMFs online. Online MMFs (such as Yu'e Bao) provided higher return yield than traditional banks. MMFs were used to invest in short-term financial assets, such as bonds, bank deposits and repos. Even though the deposits remained in the banking system, MMFs raised banks' funding costs substantially. Later in 2014/2015, traditional banks started distributing their wealth products online on IT firms' open platforms. MMFs yield reduced from 8%~12% (2013) to 3~6% (2015).	FinTech accelerated the process of shifting deposits from banks to MMFs. Major banks limited the amount of money consumers can transfer into FinTech accounts, caped at RMB 5,000 per transaction (RMB 50,000 per month). Online MMFs reduced the distribution and brokerage costs to the fund's distributors.
Shanghai Free Trade Zone (SFTZ) was used as a test ground for trade, investment and financial reforms, before its rollout nationwide. RMB can flow freely between Free Trade Accounts (FTAs), non-resident	SFTZ is the first Hong Kong-like free trade area in the Chinese Mainland. Apart from preferential policies such as lower taxes, Yuan convertibility and unrestricted foreign currency exchange, the main

onshore accounts and offshore accounts. Transactions between resident onshore accounts outside SFTZ and FTA with the same entity were also allowed provided they did not involve capital account transactions that were not yet approved by PBOC and SAFE.	purpose of the zone is to experiment with administrative innovations. It is a laboratory to advance the country's financial sector.
The **Party's Decision to deepen financial reform to further open the financial sector both inwardly and outwardly.**	Deepened financial system reforms allow market forces to play a decisive role in allocating resources and adjusting risks.
Deposit and lending interest rate marketization. China has been cutting interest rates in the last two years, a powerful signal that the government wanted to step up support for the slowing economy. It emphasized the need to reduce corporate financing costs to help struggling companies, especially SMEs. It was also an important step on the path towards interest rate liberalization in China.	China attempted to soft-land its economy by adopting a low interest regime policy. The impacts were increased property prices, infrastructure investment, household consumption and capital market liquidity. However, the risk of international fund's "flight to quality" (after US increases federal interest rates) increased economic instability.
RMB internationalization was in good progress. The use of RMB in international trade and direct investment continued to rise with about 30% of China's goods traded in 2019 denominated in RMB according to PBOC's annual report. The developments of a new RMB cross-border payment system and efforts to make RMB a reserve currency were in good progress.	The government was not prepared for a full reserve-currency status and free convertibility of RMB. RMB cannot become a true international currency until Chinese authorities lower the strict limits that remain on capital flows (that is, transactions in financial assets) between China and the rest of the world.
Along with the slowdown of China's economic growth and US Central Bank's increase of interest rates, RMB was being devaluated against USD. **RMB exchange rate liberalization** (unpeg against USD) was gradually managed by PBOC. Generally, many Asian currencies were weakening against USD.	The US and Europe QE (Quantitative Easing) policy ended in 2016/17. In response to this change, PBOC announced that it would reduce the bank reserve deposit to ensure sufficient liquidity in the market.
Deposit insurance scheme - financial institutions were required to pay insurance premiums into a fund that was be managed by an agency appointed by the	The scheme helped remove the false public belief of "implicit guarantee" by the government on their investment and deposit in banks. The scheme

State Council. The scheme was designed to return bank clients' deposits (up to RMB 500,000 per account) if their bank suffered insolvency or bankruptcy.	protected the interests of depositors in a market economy, a pivotal component of China's financial safety net.
Five privately-owned banks obtained operating permits in the pilot program. Each of these banks had different customer segments, but all had the same banking mandate to solve financing difficulties for MSEs.	LCBs accelerated investments in Internet/Mobile banking. Some banks began to engage in collaborative co-creation with IT firms & industry players.
The **Guideline Opinions on Promoting the Healthy Development of FinTech** was released to encourage innovation in FinTech and lay out measures to ward off potential risks.	Formalized governance bodies, operation guidelines and disclosure requirements for different segments of FinTech in China.
Asia Infrastructure Investment Bank (AIIB) was a good sign to further consolidate the international cooperation in infrastructure investment. AIIB will complement existing multilateral development banks and support the infrastructure and economic development in Asia	The world economy perceived a constructive attitude towards China's effort in playing a bigger role in the world's economic restructuring. China will play an important role in the governance and operations of AIIB and the "Belt and Road" initiative based on principles of openness, transparency, inclusiveness and responsibility.

Source: The author's analysis

How did these changes happen and what were their impacts? Table 11-5 below summarizes the major institutional changes during the period from 2010 to 2020, and their respective key antecedents and consequences.

Table 11-5: Major antecedents and consequences of institutional field changes (2010-2020)

Key antecedents	**Major institutional field changes**	**Key consequences**
US and European recessions forced MNCs to switch attention to China for market and investment opportunities.	Increase in domestic demand and foreign investments created new banking service requirements such as trade finance, treasury, foreign	Chinese banks established branches and subsidiaries overseas to support Chinese businesses to go global. E-banking and e-commerce experienced high-speed growth as a result of mobility internet adaptation. Measures

Increased FDI and foreign funds in China	exchange and commodity financing.	were taken to promote internationalization of RMB as a global transactional and reserve currency.
Accession to the WTO and opening-up of financial services industry to foreign equity	Relaxation of limitations and constraints on foreign banks' establishment and operations in China through continuous financial reforms and pilot programs	Rapid development of foreign banks' presence, assets and scope of services in China; Local banks needed to enhance revenue and profit efficiency to compete with foreign banks.
The US sub-prime mortgage crisis alerted the regulators of the potential risks in financial innovation.	The authority started to take a more prudent approach to financial innovation and various guidelines were issued.	Increase in financial consumers and investors protection awareness and regulations; Adaption of Basel II requirements and Basel III implementation roadmap to enhance the risk resilience and government of China's banking system
The government proposed a series of market-orientation financial reforms to further liberalize the financial sector both inwardly and outwardly.	Pilot programs of privately-owned banks, liberalization of interest rate, marketization of RMB exchange rate and internationalization of RMB	China's financial system became more open, connected and vibrant to global economic turbulence and international capital flows.
Financing difficulties of SMEs, low bank deposit interest rates and the surge in e-commerce transactions led to the boom in FinTech operations.	There was a surge in online P2P lending, mobile payment and online distribution of financial products.	The distribution and sales of financial products through Internet platform led to new forms of credit, market and operation risk as well as new forms and issues of shadow banking.
Many new players, IT, telecom and media companies, started offering FinTech services to the public. Rapid development in FinTech (especially P2P financing) created new	The "Guideline Opinions on Promoting the Healthy Development of FinTech" was issued to regularize/formalize the governance responsibilities	License was issued to Internet companies (such as Alibaba and Tencent) in an attempt to govern the operations of large FinTech firms. Online transactions threatened the traditional retail business.

challenges to the regulatory framework and financial consumer/investor protection.	and manage risk exposures in FinTech operations.	
Interest rate liberalization forced banks to accelerate business transformation.	Regulators adopted a "build first, regulate later" approach to financial innovation in traditional banks and FinTech. Deposit insurance scheme was introduced to protect depositors in the event of institution bankruptcy.	Transitional banks attempted to establish cross-industry collaboration with IT firms and industry players. Traditional banks optimized their advantages of physical branches to provide online to offline (O2O) integrated services and channel effectiveness.

Source: The author's analysis

Who were the key actors in these changes and how did they reshape China's financial service industry landscape? Table 11-6 below summarizes the key actors in these changes and their respective roles.

Table 11-6: Key actors in institutional change and their respective roles (2010-2020)

Key actors	**Key roles**
Chinese Government	• Institutionalize and promote the financial services industry, deepen reforms through marketization of bank deposit and lending rates, liberalize RMB exchange rate, internationalize RMB, and formulate deposit insurance schemes. • Encourage innovation and changes in traditional banking services through private-bank pilot programs and FinTech innovation support. • Ensure financial/economic stability through the implementation of appropriate fiscal and monetary policies.
Regulators (PBOC & CBRC)	• Regularize/formalize governance in healthy FinTech development by issuing Guidelines and Directives. • Set up specific departments to protect the interests of financial consumers and financial investors. • Monitor the exposure of financial risks in shadow banking.

Traditional banks	• Establish sound financial governance frameworks to comply with international conventions such as Basel II and III. • Facilitate implementation of government policies through offering of various financial instruments and facilities. • Secure the financial stability of the country through effective forex management, allocation of deposit and lending resources, as well as onshore and offshore RMB bonds markets issuance.
FinTech firm	• Resolve SMEs' financing difficulties through P2P lending. • Challenge the monopoly business of traditional banks through innovative financial innovations such as online MMFs and mobile payment. • Promote inclusive financial systems through branchless and mobile banking. • Instill effective distribution of financial services and products through online open platforms.

Source: The author's analysis

The next section explains the roles and implications of regulation and innovation on institutional arrangement in China.

11.2.2 Impacts of Regulation and Innovation on Institutional Changes

How does regulation affect institutional changes? FinTech led to the issues of ambiguous legal status and unclear business boundaries. The lack of regulation resulted in the wild growth of unsupervised P2P lending, which has neither a clear regulatory framework or a supervisory body. Any IT firm can establish P2P lending platforms with few PCs and a rented server. This leads to the increasing shutdown of P2P lending platforms and investor money embezzlement. The insufficient risk control in FinTech also resulted in unquantified operational, credit and market risks due to the "borderless nature of FinTech". Limited mandatory information disclosure to the public and regulators has led to financial disputes and financial consumer protection issues. FinTech is threatening the dominant position of the traditional

financial service players in the market. Traditional bankers have been lobbying to regulators and complaining that FinTech firms are “disobeying” the financial rules and “destroying” the financial stability of the country. In response to these issues, China’s regulatory authorities have been taking an active attitude towards the development of online finance. FinTech requires similar if not higher requirements on financial supervision, financial consumer protection and macroeconomic control. New regulations were drafted and promulgated to lead the Internet financial industry to grow in a healthy way.

Specific measures were taken to strengthen the financial system by introducing laws related to financial investor protection, on-line banking, shadow banking and innovative financial instruments. The government also promoted the implementation of Basel compliance in the banking sector. The roles of regulation in China’s financial institutional change are to (1) strengthen internal coordination and international cooperation in the regulatory and supervisory activities; (2) provide education and increased customer awareness on risks associated with FinTech investments; (3) increase awareness and control over financial innovation activities; and (4) accelerate the adoption of global convention (such as Basel standards) to enhance the risk resilience and governance capabilities of China’s banking system.

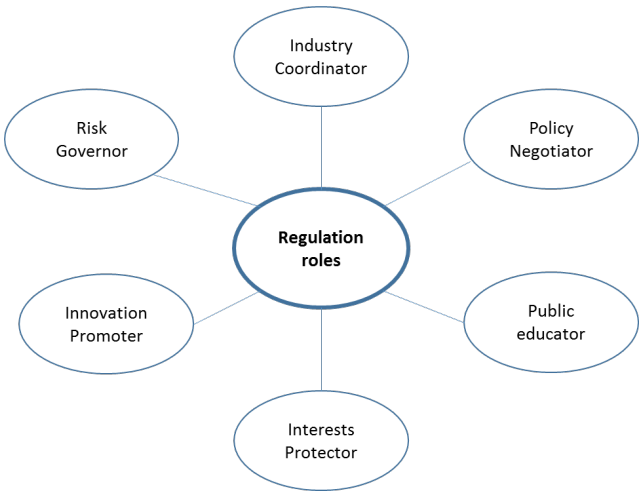

Figure 11-1: The role of regulation in the institutional field changes

Source: The author’s analysis

In short, regulation helps regularize the transformation in the institutional field arrangement by installing appropriate governance bodies, measures and monitoring mechanisms to ensure that the changes are supervised, risks contained, and innovation/creativity not suspended. An important role of regulation in the transformation is to ensure financial system stability and that the interests of various parties are protected, balanced and optimized.

How does innovation affect institutional change? To promote financial innovation, the government adopted a tolerant attitude toward risks caused by financial innovations, while continuing to improve the regulations concerned. The roles of financial innovation in the Chinese financial institutional change are to (1) prompt the government to support the development of new industries (e-commerce and e-banking) in creating an innovation-driven economy; (2) promote local banks to enhance their capabilities in products and services, as well as procedure and business model innovation to keep competitive; (3) develop business solutions for increased demands on banking solutions in terms of cash management, investment and financing activities from MNCs and SOEs in China and SOEs going global; (4) develop high yield financial instruments to optimize risks and cash returns; and (5) develop Shanghai as an International Financial Center by 2015, according to the 12th Five-Year Plan.

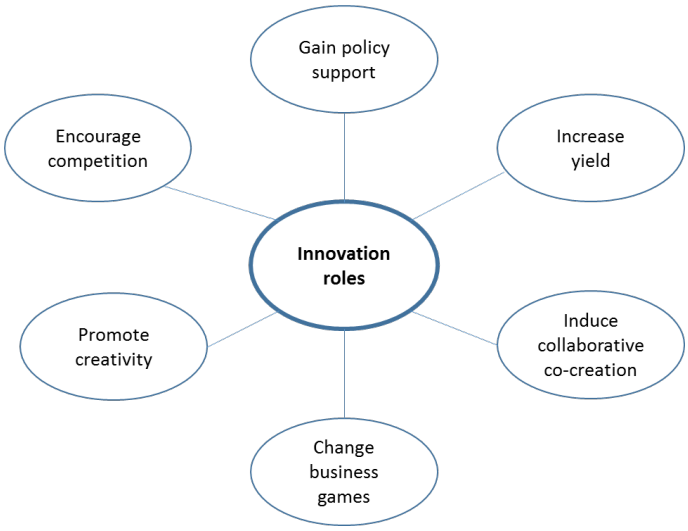

Figure 11-2: The role of innovation in the institutional field change

Source: The author's analysis

The following sections will examine various forms of institutional change in China's banking system, offering a glimpse of institutional design and diffusion in the branchless banking model.

11.2.3 Institutional Design and Diffusion: Branchless Banking Model in China

Background

The case studies revealed different innovation models for branchless banking. The findings

have enriched the current literature on branchless banking, especially in mobile banking. Existing literature shows that Chinese financial consumers have been primarily using bank branches and ATMs to fulfill their daily monetary deposit and withdrawal needs. Branch banking is a key customer channel to provide all banking services, online and offline. The strength of branch banking is perceived to have higher transaction security and accuracy in a real-human interface environment rather than intercepted by an electronic medium. ATM is the most frequently used banking channel as it offers a high level of convenience for 24 X 7 non-stop services and does not require customer access to computer facilities. However, these user behaviors are changing with more and more banked people using mobile banking in recent years. Branchless banking in China is driven by a convergence of forces from traditional banks and FinTech firms, which offer transactional banking services and tailored financial products for individuals over the Internet. According to CGAP (2011), "*Branchless banking involves the delivery of financial services outside conventional bank branches, using agents or other third-party intermediaries as the principal interface with customers, and relying on technologies such as card-reading point-of-sale (POS) terminals and mobile phones to transmit transaction details. Although the term 'banking' is used, branchless banking or banking beyond branches is not limited to bank services; it may include a broad array of financial services often provided by nonbanks.*"

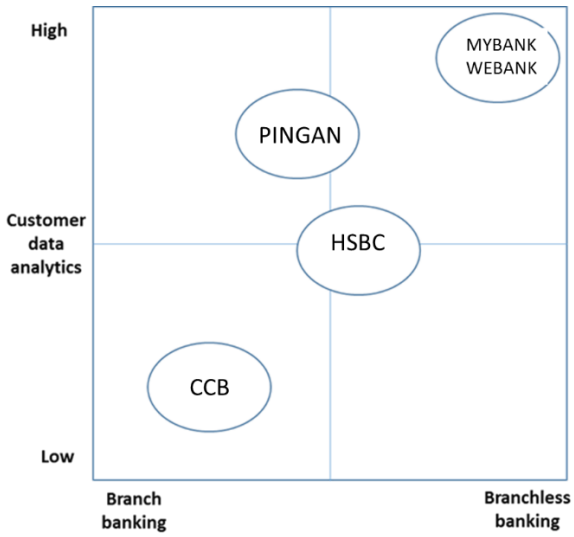

Figure 11-3: The degree of branchless banking

Source: The author's analysis

Based on the empirical data collected from case studies, CCB relies heavily on its extensive branch network as its primary customer channel. CCB has over 150,000 branches in China serving 3.5 million corporate customers and 315 million personal customers. CCB seems to

have not fully exploited the values and insights hidden within the rich data collected from transactional banking and customer profiles. Therefore, CCB is low in both branchless banking and customer data analytics. Ping An is actively developing Orange E Network, a cloud e-commerce collaborative platform for SMEs which facilitates online commerce, payment, financing and wealth management/investment. Ping An performs deep analytics on its customer data to identify opportunities for cross-selling and bundling services to its insurance and banking customers. Ping An is more branchless than CCB and has deeper insights from customer data than HSBC. HSBC has a well-integrated HSBCNet that connects with customer ERP system and global banking partners/customer networks. HSBC has a good understanding of local business needs and adjusts its global services/products for the local market deployment. HSBC leverages on its technology platform for branchless banking to serve its MNCs customers with a strategy to establish branches only in Tier-One cities in China. Therefore, HSBC is more branchless than CCB and Ping An, but engages in less customer data analytics compared to Ping An which has big data collected from its insurance customers. Finally, MYbank and WeBank pioneered a 100% branchless concept, with no physical branch, ATM or offline services. The cloud-bank concept relies on a 100% mobile platform which continues to integrate its financial services with Alibaba's online purchase platform for MYbank and WeChat social medial platform for WeBank. MYbank has the strength of real big data on its customers' profiles, behavior and transactions from its Tmall and Taobao online purchase platforms, while WeBank has detailed user profiles, social networks and transaction records from its QQ and WeChat social media platforms. Therefore, MYbank and WeBank are the highest comparatively on both branchless banking and customer analytics.

China's branchless banking is driven by the convergent forces of traditional banks and FinTech firms enable financial users to access financial markets, services, and information over the mobile Internet. Mobile banking provides a very convenient and effective means of managing personal finances and supporting seamless connectivity anytime and anywhere. Mobile banking can be considered as one of the most significant financial service innovations, which is emerging as a key platform for expanding access to banking transactions via mobile devices. Mobile banking provides the benefits of convenience, reduced time, lower transactional costs, access anywhere and anytime, and transactions with anyone. However, mobile banking also comes with issues of insecurity, fraud and overspending. Mobile banking can adapt to all networks, mobile devices, and delivery channels, including SMS, USSD, mobile Web and mobile client applications. Mobile payments are at the center of Mobile banking and Mobile commerce. Several unique features of mobile banking compare other forms of banking,

including branch, Internet, ATM and telephone banking, are service ubiquity (anywhere), immediacy (anytime), localization (anywhere), instant connectivity (always-on), pro-active functionality (privacy), security (protection), convenience and mobile wallet (paperless). Mobile banking helps reduce transaction costs, overheads (staff and rental) and capital investment. Mobile banking also extends the customer reach beyond location boundary.

The mobile (branchless) banking model in China can be grouped into two major innovation models, namely, the FinTech Model (MYbank, WeBank and aiBank) and the BankTech Model (CCB, Ping An and HSBC).

11.2.3.1 The FinTech Model in China

The first type of branchless banking model is the FinTech model (conceptualized based on MYbank). The study of institutional diffusion focuses on the diffusion of an institutional form or practice within a population of organizations that are in the same institutional environment. It studies the generalizability, promotion and retiring of the new forms of norm and practice in the entire industry. Institutional diffusion can be usefully categorized with respect to whether diffusion occurs through regulative, normative, or cultural/cognitive processes of change. An evolutionary theory of variation, selection, and retention processes is often used to explain institutional diffusion (Scott, 2001; Van de Ven and Hargrave, 2004)

How do institutional arrangements reproduce, diffuse, or decline in a population or organizational field?

China's rapid adoption of technology, including mobile phones and mobile Internet, has accelerated the pace of adoption for branchless banking and put affordable technology and connectivity within the reach of the poor. There is an exceptionally strong mandate from the government to provide customers, particularly in rural areas, with new touch points for branchless banking, which has driven innovation, particularly from FinTech. The case studies indicates that market feedback (technology advancement, user adoption and open state policy) can foster the legitimacy and therefore diffusion of branchless banking and digital mobile payment in China. The nature and timing of institutional diffusion of an innovation depend on the size similarity, geographic proximity and network ties in the specific institutional arrangement context (Lee and Pennings, 2002). For example, the case studies suggested that the social and policy network ties enabled early adopters of branchless banking to learn about

the new practices and taking some risks in the institutional arrangement. They gained the price and market premium as early adopters. And at the same time, they enabled late adopters to learn about and adopt accepted practices so that they can achieve legitimacy. MYbank is a classic early adopter of branchless banking. The success for Yu'e Bao (online monetary funds with higher than market interest rate) not only created a massive stream of similar online WMP distribution in China's branchless banking system, but also invoked a series of new regulatory issues and concerns over the speed and volume of funds accumulated over a short time.

Are these institutions and their operating models alike?

Based on the case studies of MYbank, WeBank, Du Xiaoman and aiBank, the institutional arrangement and product offerings by FinTech firms share some common features. For example, they are all separate legal entities led by banking professionals (joined from traditional banks). They all have a flat organizational structure and leverage on technology and data from the parent company. Most of the FinTech branchless banking model has similar key components. As we conceptualized from MYbank's FinTech innovation model, at the core of the FinTech model is mobile payment service which allows operators, banks and IT firms to provide financial services such as micropayments, bill pay, funds transfer and top-ups. Mobile payment or digital money makes it possible to purchase goods and services from merchants online, make person-to-person transfers, top off credits, make investments, and pay bills. Financial institutions in developed and emerging markets can rely on mobile payment services for complete mobile banking solutions that support all financial transactions via smart phones. Thus, it introduces a new model of mobile banking which is customer-centric and service-oriented. Mobile banking in this model is restricted to its own network, registered users, local currency, QR code/passwords and mobile client applications.

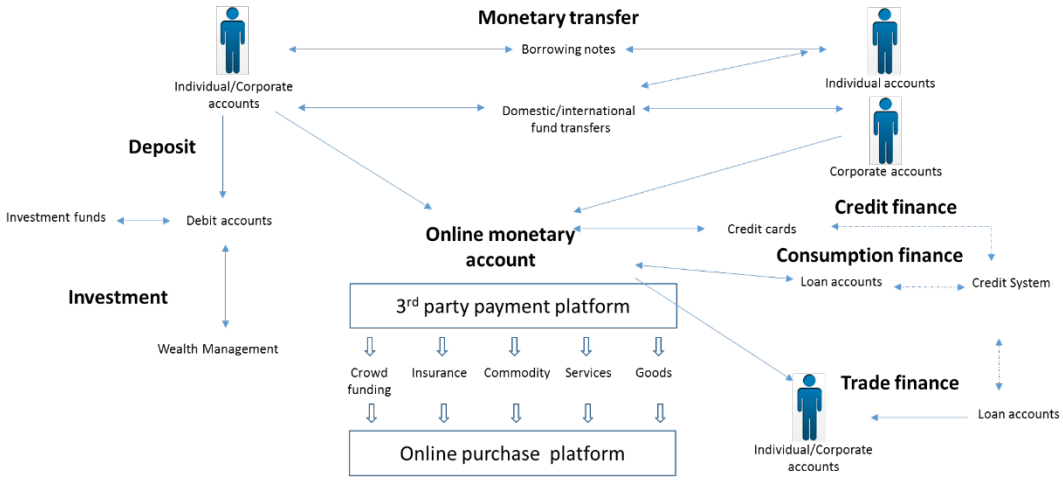

Figure 11-4: FinTech operation model (conceptualized based on MYbank)

Source: The author's analysis

Does competition for scarce resources force actors to imitate and conform to legitimate institutional practices?

Based on the case studies, the FinTech firms generally face scarce resources in terms of experienced banking professionals who can help them comply with regulatory requirements, manage credit risks, and develop sound credit modeling. In addition, the FinTech firms also face constraints in the deposit side of business (due to no branch networks) and have cooperated with traditional banks for large funding and distribution businesses. Apart from that, the FinTech model operates on an open platform and two-sided economics model for branchless banking which forces them to fight for critical mass of user and merchant base in order to create the legitimacy in direct banking practices. They are also competing for talented computing resources in data science and advanced computing power. In computing, an **open platform** describes a software system which is based on open standards, such as published and fully-documented external API that allows the use of software to operate in other ways than what the original programmer intended, without requiring modifications of the source code. Using these interfaces, other online financial service or asset management providers could integrate with the platform to increase functionality. An open platform implies that the platform owner allows, and perhaps supports, the ability to provide collaborative or bundled financial services. An open platform has a service-oriented architecture (SOA) which allows applications, running as services, to be accessed in a distributed computing environment, such as between multiple mobile handset operating systems (such as IOS and Android) and across the Internet. A major focus of mobile web services is to make functional building blocks accessible over standard Internet protocols that are independent from platforms and programming languages. An open SOA platform would allow anyone to access and interact with these building blocks. Simply put, the open platform provides opportunities for online co-creation and co-provision of financial services to the financial consumer "as and when required" based on specific application scenarios anytime anywhere and with anyone.

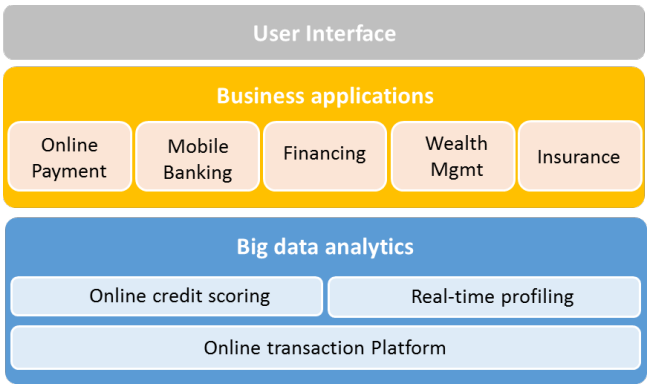

Figure 11-5: FinTech system architecture (conceptualized based on MYbank)

Source: The author's analysis

Are the population and industry of organizations exposed to same institutional environment?

The FinTech innovation model is built on a three-layer system architecture design. The foundation layer is a big-data analytics layer which consist of an online transaction platform to collect rich data on such aspects as user profile, activities, social networks, preferences and transactions in a real time manner. On top of this rich data set are an online credit scoring engine and real-time user profiling mechanism which generate user creditworthiness based on pre-built credit scorecard and modeling. The big-analytics layer is able to process user credit/financing approval in a fraction of second. All credit application, consumption and repayment are converged over multiple channels within the business logics processing and communication layers. The intermediate layer is business application layer which consists of scenario-based client mobile applications such as mobile payment, mobile banking, real-time financing/credit, wealth management marts and insurance markets. These client mobile applications are built to interact with users in different application scenarios on 24 X 7. It is a paradigm shift in financial service provision from "go-to banking" to "banking anywhere, anytime and with anyone". The top layer is graphical user interface which allows users to interact with mobile devices through graphical icons and visual indicators. They key to this layer are user authentication, information security and transaction authorization. Some believe that at the center of this three-layer model are user traffic and business application scenarios. Mobile banking and mobile payment bring the online financial banking services close to the service request creation point using mobile phone's unique features like location-based services (LBS), camera, mobility, secured passwords and QR code scanner. Users can choose to host products and services they like in their handset. Mobile banking provides users with the access to innovation services whenever Internet connection is present. Financial users can use their mobile handsets to make financial transactions with other users in the same way as running a business transaction at a bank branch.

Mobile payment transforms the mobile phones into secure, self-contained purchasing-support tool, capable of instantly authorizing payment over the cellular network. Mobile wallet (digital money account) enables financial users to manage their financial assets and liabilities with a single click from their wireless device.

The FinTech model is form of cloud-based banking. All banking transactions are performed online, without physical outlets, tellers or ATMs. This helps reduce transaction costs, human costs and asset/property capital investment costs significantly. The cloud-based mobile banking can offer many traditional banking services including deposit, investment, payment, P2P money transfer, trade, credit and consumption financing online to specific group of financial consumers based on big-data on their credit worthiness, living profiles and business operational data. An open platform allows more service offerings to be provided to the financial users at low costs as new innovations can be easily coupled into the platform based on standard APIs. Second, the FinTech firms adopt a Rapid Application Development (RAD) process which allows a shorter time-to-market in new service innovation and delivery. RAD is characterized by concurrent processing of new product/service specification, design and implementation. There is no detailed specification, and design documentation is minimized. The novelties are developed in a series of increments. End users evaluate each increment and make proposals for later increments. User interfaces are developed using an interactive development process. Key advantages of RAD include accelerated delivery of innovations and user inclusion in the innovation process. Each increment delivers the highest priority functionality to the users. Besides, users have more involvement in the R&D process which means the innovation is more likely to meet their requirements and the users are more committed to the novelties.

A limitation of FinTech model is that the digital money cannot be transferred between different banks and different platforms. Digital money account in mobile application is tied/connected to the user's traditional bank account. The FinTech model relies on the traditional banking channel for users to interexchange between digital money and real money. In other words, the FinTech model cannot sustain without the traditional offline banking operations to support cashing. Also, the digital money is transacted on a closed platform. Specifically, digital money in Apple Pay, PayPal, Alipay and WeChat Pay accounts is NOT freely exchangeable across platforms. This restricts the use of these individualistic digital money as a cryptocurrency. In addition, the continual and rapid changes on the platform tends to corrupt software structure, making it more vulnerable to systematic risks. A culprit who exploits the system loopholes or bugs to break the system security may pose systematic and replicated risks to the entire platform. Unlike traditional banks which invest heavily in a robust

IT platform to comply with the regulatory and risk requirements, FinTech firms invest more in service/functionality delivery capability to quickly achieve the critical mass users base. Based on the case studies of MYbank and WeBank, FinTech lacks the capability in credit modeling and financial product design. The financial product developed by IT firms, therefore, may have contained security, credit and design risks which threaten the stability of the entire financial system. This is more severe when FinTech mobile banking model becomes a major component of the financial system.

Do these FinTech firms engage in an evolutionary process of variation, selection, and retention of institutional forms?

The case studies indicated that the FinTech firms originated from a HQ FinTech department or division in the early 2010s. The private banking program in 2014/15 provided an opportunity for these FinTech firms to spin off from their parent companies and operate on their own balance sheets and work teams. This is required as mobile payment application is developing fast and wide in the Chinese market. Most restaurants, cinemas and convenient stores accept digital money such as Alipay and WeChat Pay via QR code. With no surprise, China has become the largest digital money market with mobile e-commerce and small mobile payments and investments. At the same time, an emerging trend of big data collection, analytics and applications begin to change the Chinese financial landscape. Most of the FinTech firms have already set up their data scientist department to unearth the values of large user profile and transactional data. One of the interview participants say, "*Financial services firms are consolidating data traditionally managed in silos to analyze risk exposure, comply with regulatory mandates, and use the data for multiple purposes. Traditional technologies such as relational database management systems make it challenging, if not impossible, to process growing volumes of data and make it accessible, actionable and flexible to changing needs in terms of queries and analytics. 'Big data' solutions that support evolving business and regulatory requirements by maintaining an ecosystem of large data sets will become invaluable in their ability to be used for multiple purposes and to answer any question months or years from now.*"

Do we see institutionalization or deinstitutionalization of institutional arrangements in a population of actors?

Based on the case studies, financial institutions are investing to acquire larger market data sets and deeper granularity to feed predictive models, forecasts, and trading throughout the day. New regulatory and compliance requirements are placing a greater emphasis on governance

and risk reporting, driving the need for deeper and more transparent analyses across FinTech firms and traditional banking. Financial institutions are ramping up their enterprise risk management frameworks to help improve enterprise transparency, auditability and executive oversight of risks. Financial services firms are looking to leverage large amounts of consumer data across multiple service delivery channels to uncover consumer behavior patterns and increase conversion rates. Emerging markets like China and India are outpacing Europe and the U.S. as significant investments are made in local and cloud-based data infrastructures. As a result, advances in big data technology will help financial services firms unlock the value of data in operations to help reduce costs and discover new revenue opportunities. Traditional data warehouse systems will need to be re-engineered with big data technologies to handle growing volumes of information. Predictive credit risk models that tap into large amounts of payment data are being adopted in consumer and commercial collections practices to help prioritize collections activities. Mobile applications, tablets and smartphones are creating greater pressure for company networks to consume, index and integrate structured and unstructured data from a variety of sources.

As discussed before, one of the major limitations of the current ICT-based digital money is its restriction on cross-platform exchange. A new online transaction processing and recording technology, blockchain, may be able to resolve this problem. **Blockchain** is a permission-less distributed database that maintains a continuously growing list of transactional data records hardened against tampering and revision, even by operators of the data store's nodes. The initial and most widely known application of the blockchain technology is the public ledger of transactions for bitcoin and the inspiration of similar distributed ledgers. Each blockchain record is enforced cryptographically and hosted on machines working as data store nodes. Using the blockchain technology, users of the system (multiple payment platforms) create transactions which are loosely passed around from node to node on a best-effort basis. The definition of what constitutes a valid transaction is based on the system implementing the block chain. In this cryptocurrency application, a valid transaction is one that is properly digitally signed, spends one or more unspent outputs of previous transactions, and the sum of transaction outputs does not exceed the sum of inputs. Every node in a decentralized cryptocurrency has a complete or partial copy of the block chain. This avoids the need to have a centralized database that other systems, such as PayPal, require.

In 2019, PBOC announced that it was planning to steadily develop a system of rules to regulate financial technology (FinTech) in the country. PBOC also revealed that it intended to completely utilize the technology to enhance the flow of credit and reduce financing costs for

businesses, as well as improve the ability to prevent risks. These moves further strengthened the institutional reform in FinTech firms towards responsible financial innovation and behavioral banking risk management. China's state imposes pressure to make FinTech innovation procedures and/or structure conform to best practices (regulations to be announced soon). Its legitimacy is explained through imposing regulations that control and limit certain over-aggressive behaviors (such as P2P lending scandals). The behavior is enforced as an outcome of the costs associated with violating the regulations (Scott, 2001).

Summary

The FinTech model which relies on ICT advancement, mobile payment and big data initiatives are driving increased demand for algorithms to process data, emphasizing challenges around data security and access control, as well as minimizing impact on existing systems. Institutional diffusion studies examine the spread and erosion of institutional arrangements within a population or organizational field. The FinTech model of innovation diffusion in China shows an interesting phenomenon of how private technology firms "move the cakes" and invoke a disruptive change in the financial service industry which has been dominated by state-owned banks.

11.2.3.2 The BankTech Model in China

The second type of branchless banking model is BankTech Model (conceptualized based on CCB, Ping An and HSBC).

Institutional design considers institutions as a reflection of conscious and intentional decisions and actions that individual actors take to create or change institutional arrangements to resolve conflicts. It aims to set new rules of the game that enable and constrain actors by changing their rights, duties, or roles. The progression of BankTech innovation and deployment has been accelerated by the FinTech Model. Institutional design occurs when actors question the norms or "taken-for-granted" scripts. The change is intentional, purposeful, manipulative, responsive and confirmative to situational changes (Hargrave and Van de Ven, 2006).

Background

Despite the rapid development in China's FinTech operations, the traditional banking system remains important (constituting over 95% of assets in the Chinese banking system) to China's financial service industry and financial inclusion for the unbanked in rural areas. The

adaption of innovative practices of successful microcredit operations, the growth and diversification of financial services for the poor are still depending on the scale and influences of traditional banking sectors. However, for the mainstream financial sector, providing financial services to low income population has always been considered difficult and costly. This is attributable to several reasons. First, traditional banks are not efficient in managing loans of small amounts which entail high credit checking, transaction and processing costs. Second, it is never easy to deliver services to sparsely populated areas with little telecommunication infrastructure available. Finally, clients' poorly-documented credit histories increase risk for the financial agents. Some literature suggest that financial inclusion through the correspondents' bank-led branchless banking innovation positively contributes to local socio-economic development but, at the same time, presents clear negative signs such as low-income population, over-indebtedness, reproduction of social exclusion practices, and reinforcement of power asymmetries.

How do institutional arrangements reproduce, diffuse, or decline in a population or organizational field?

It is very difficult for smaller manufacturing businesses that do not have land or properties to use as collateral or cannot find bigger businesses for banks to recognize as guarantees to get bank loans, no matter how high an interest rate they are willing to pay. Although the private sector contributes about 60% of China's GDP and SMEs make up the majority of Chinese companies, they have been battling with financing difficulties since banks see private businesses, especially SMEs, as riskier than SOEs, which are implicitly guaranteed by the government. The Chinese government is clearly aware of the problem and has been emphasizing the importance of supporting private companies through private banking for financial inclusion. LCBs are requested to streamline their credit processing to provide financing services to SMEs, especially those affected by COVID-19, social unrest in Hong Kong, and the ongoing trade war between China and the U.S.

During the case study interviews, CCB and Ping An already started offering mobile banking solutions for their clients, with differing levels of sophistication. With the continuous expansion of the mobile user base and increasing demand for mobile financial channels, coupled with the urgent need for traditional banks to adopt new delivery options, the BankTech model is poised for growth. Increased Chinese commercial banks are effectively serving low-income market segments or specifically designing mobile services for unsecured loans to SMEs. For example, CCB has an innovative account-to-cell remittance product and mobile enterprise solutions tailored for small business. In terms of financial inclusion, the BankTech model thus

focuses on serving clients who are already banked, rather than using these innovations to reach the unbanked and underserved markets. The gap is filled up by FinTech model which provides small financing using low-cost and accessible mobile channels to drive financial inclusion.

In addition, theories of financial intermediation also suggested that one of the main roles of a bank is serving as a relationship-based financial service provider. As a bank provides more services to a customer, it creates a stronger relationship with the customer and gains more private information about him or her. Such relationships can potentially benefit both banks and their customers. For instance, relationship banking can help banks monitor the default risk of borrowers and provide the banks with a comparative advantage in lending. Relationship banking can also lower banks' cost of information gathering over multiple products. Depending on the competitiveness of the banking sector, such benefits to BankTech model can lead to increased credit supply to customers, through either greater quantities and/or lower prices of credit.

The rich data collected by banks from financial consumers' daily activities and transactions present a real opportunity to the BankTech model for continuous customer care. With the enhancement in computing technology and mobile Internet connectivity (such as LBS and GPRS), traditional banks can readily access real-time information about customers' collateral, their inventory and accounts receivables, which is useful for loan monitoring. Another example is that the advancement in big data analytics technology may allow banks to obtain both "hard information" on credit card user spending and "soft information" about their spending behavior and preferences. Then, how do traditional banks strategically leverage on the technology advancement to sustain their market influences/monopoly through expanding into a mobile-based branchless banking model?

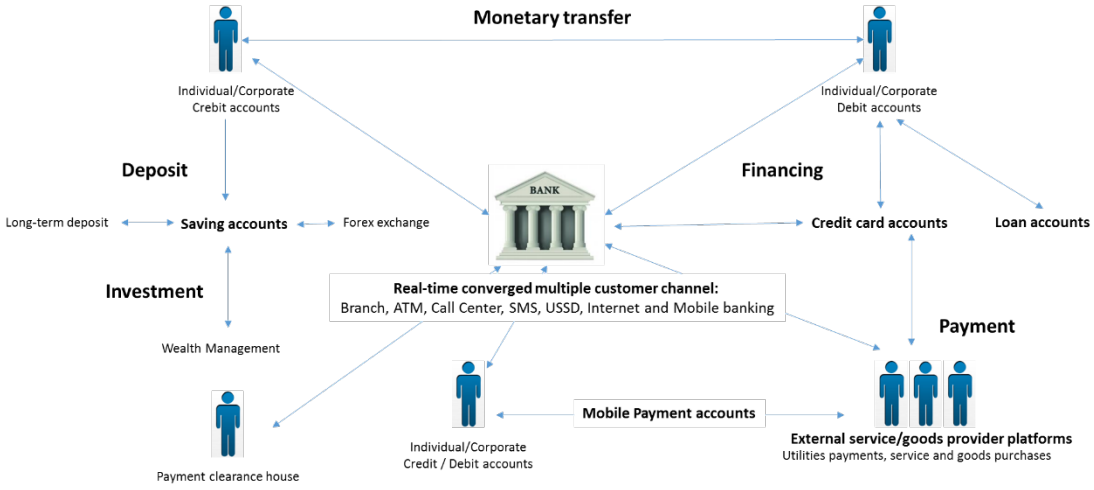

Figure 11-6: The BankTech operation model (conceptualized based Ping An)

Source: The author's analysis

Individual entrepreneurial actor(s) with bounded agency: affordance and partisan mutual adjustment

In the discussion of institutional diffusion, it is necessary to incorporate the actions and influences of institutional entrepreneurship or the new template builder. Institutional entrepreneurs are change agents, but not all change agents can be regarded as institutional entrepreneurs. Only actors who initiate divergent changes, that is, changes that break with the institutionalized template or logics for organizing within a given institutional context and those who actively lead and participate in the implementation of these changes, can be regarded as institutional entrepreneurs (Battilana *et al.*, 2009). Changes that are diverse from the existing institutional arrangements are qualified as institutional design.

Perhaps one of the most important new template builder or institutional entrepreneurs for interoperability and financial access of the BankTech model is CUP, also known as CUP. CUP is the only domestic bank card enablers organization in China. It is a major focal point for interoperability, branchless banking, and digital payments. And it is central to a broad range of innovative payment pilots designed to increase financial inclusion, including the agent banking pilots in rural China. Founded in 2002, CUP is a state-owned association for China's banking card industry operating under the supervision of PBOC and with about 400 domestic and overseas member banks. It is the only interbank network in China, excluding Hong Kong and Macau, linking the ATMs and electronic funds transfer at POS throughout the Chinese Mainland.

Are these institutions and their operating model alike?

The BankTech model adopts a semi-open multi-sided platform (MSP) model of branchless banking. An MSP refers to the mediating role of service platform between two or more groups of agents. MSP includes different organizations in finance, banking and other industries such as debit and credit card payment schemes, which cater for cardholders and merchants (CUP, MasterCard, Visa), financial intermediations, insurance, securities, online and mobile banks, shops, social services, e-payment services, e-commerce, e-acquiring and electronic payment systems. The BankTech model in China is generally semi-open. These branchless platforms (of Ping An, CCB and HSBC) have restricted access to external service providers and blocked interoperability with third-party payment operators. However, they are open to online purchase platforms (such as utilities, wealth management, telecommunication and travelling services) which have business alliances and platforms interfaces with the said banks.

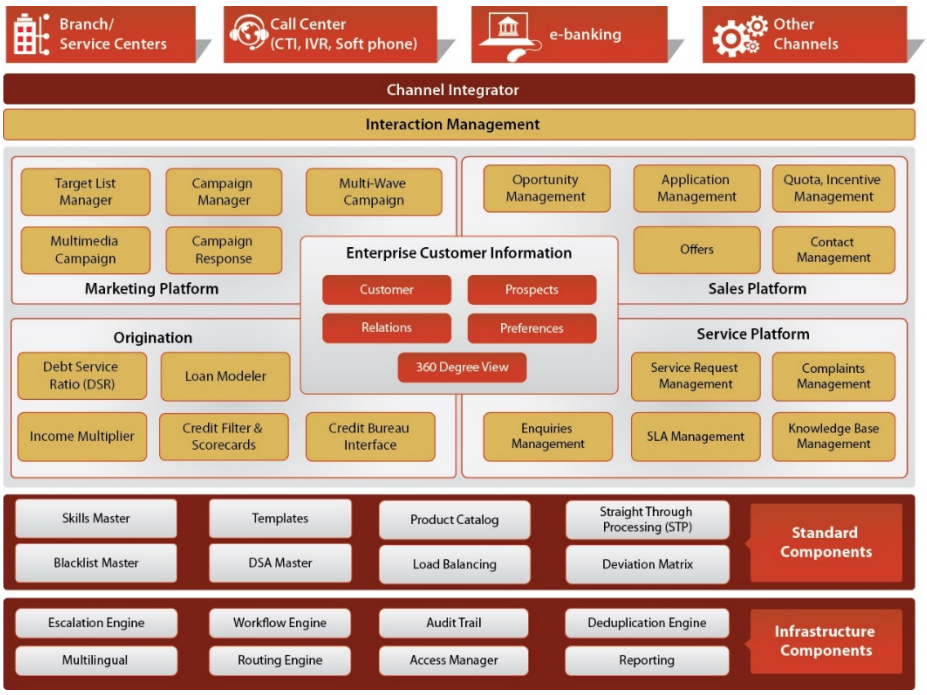

Figure 11-7: The system architecture of the BankTech model

Source: Infosys Finacle (2015)

The BankTech model is more than just a channel. It provides a new way of thinking about old processes. Banks that can conceptualize bank interactions through a mobile device, beyond simple transaction order taking, can provide unique client experiences. At the core of the BankTech model is real-time convergence of multichannel customer transactions and activities. Traditional banks have both physical channels (branches, ATMs, POS and Call Centers) and virtual channels (SMS, USSD, Internet, mobile banking and mobile client applications) to interact with customers. Improving the experience of end users is at the center of multichannel convergence. The bank needs a real-time single view of the combined interactions with its customers. This requires an integrated platform which pulls together customer interaction information and activities from multiple channels in a coherent manner. The consistent user experience is having all the pieces of silo information consolidated in one spot and accessible for any person, call center, branch personnel, relationship manager or online technology, mobile phone, tablet, ATM that interacts with the clients. Getting to the omnichannel endpoint requires the banks to adopt a holistic approach to CRM (Customer Relationship Management), technology platform and client application development. The abilities to centralize business services to save costs, easily deploy services over any channel for more consumer choices, and achieve a shorter time-to-market for new services are no longer “nice-to-have” luxuries — they are now “must-have” attributes to stay in the game.

Does competition for scarce resources force actors to imitate and conform to legitimate institutional practices?

The BankTech model helps traditional banks stay competitive against the incumbent FinTech model by improving its cost structure, services offering, channels consolidation and seamless customer experience. Mobile services for financial inclusion are enabling widespread use of money transfers, credit and savings. Platforms can play a crucial role in making services available in an easy and affordable way for local providers, developers, and communities, for not only smart phones but also low-cost handsets. Most ordinary people still trust the "brick-and-mortar" building of traditional banks and prefer the BankTech model over the FinTech model. Recent shutdowns and run-away FinTech firms also increased the worry over the stability of Fintech banking. Therefore, the BankTech model has the heritage trust, human touch, and people relationship advantages. Mobile service MSP creates the ecosystem for services to low-income users. By breaking the barriers of the conventional branch-based banking (in terms of cost, manpower and capital investment), the BankTech model of branchless banking helps reach out to the customers in rural areas, provides them with an alternative to access financial services, and improves financial inclusion overall. Many Chinese government subsidies and submissions (such as low-income subsidies and social security submissions) are still distributing through the traditional banking system. The BankTech model provides the opportunities to bring basic banking and electronic transactions services to unbanked consumers in the urban areas.

However, a major limitation of the BankTech model is that it is a semi-open platform. It restricts the driving force behind multisided markets and open platforms in financial services to induce coordination (and innovation) among two or more groups of affiliated partners and what they coordinate on is precisely a fixed point in the architecture of transactions in which they collectively participate. Another issue with the BankTech model is too much regulatory and compliance burden to truly innovate. Traditional banks are risk-adverse, conservative and lack the creativity engine (people, process and mechanism) to push the limit to provide collaborative innovations by leveraging on the externality capabilities.

Are the population and industry of organizations exposed to same institutional environment?

In general, traditional banks are more capital-intensive and thus can invest more money in technology and process, such as online and mobile banking systems. Traditional banks are also the most likely to have a widespread physical presence and multiple online channels. In this context, traditional banks, particularly the national chains, remain the best choice for corporate

and high-net-worth customers who value security, trust and professional services more than convenience. However, there are some downsides to traditional banks. The on-site experience can be impersonal; fees tend to be on the high-end when compared to FinTech firms; and interest rates on deposit accounts tend to be low. Going forward, traditional banks in China are likely to co-work with FinTech firms to establish a new business model of "Internet+ banking". For example, in 2015, China CITIC bank and Baidu jointly set up CITIC aiBank which was based on a direct banking business model. However, the BankTech model will not migrate to a fully open platform as there are numerous compliance and security issues associated with the platform openness. The BankTech model will continue to be the mainstream choice for online and offline banking service providers. As such, we are seeing some hybrid models bearing the features of both the BankTech model and the FinTech model emerging in China.

Is there an evolutionary process of variation, selection, and retention of institutional forms?

Under the BankTech model, traditional banks shall develop a single contact or single sign-on to empower users to open diverse accounts with the bank in an impressively simpler manner and without the need to experience the same procedures every time. Traditional banks shall consider transferring selected branches into **high-tech financial boutiques.** These flagship stores shall be equipped with the extensive use of digital technology, including display panels forming media walls, interactive touchscreens, "face-to-face" phone banking and video-conferencing facilities for interactions with banking specialists. In addition, these flagship stores can also incorporate other innovations, such as a check-deposit machine with imaging technology, iPads carried by in-branch staff, and a workbench with Apple terminals for account opening and other services. An example is Citibank Singapore's flagship High-Tech Smart Banking Branch at Orchard SMRT Station (opened in 2010).

What implications does the BankTech model have on the theories of financial intermediation?

Mainstream economists generally agree that financial intermediation serves three major functions. First, creditors provide a line of credit to qualified clients and collect the premiums of debt instruments such as loans for financing homes, education, auto, credit cards, small businesses, and personal needs. The role of financial intermediation is essentially converting short-term liabilities to long-term assets, requiring banks to deal with a large number of lenders and borrowers and reconcile their conflicting needs. Second, financial intermediation plays a key role in risk transformation by converting risky investments into relatively risk-free ones, such as lending to multiple borrowers to dilute the risk. Finally, it is convenience denomination

by matching small deposits with large loans and large deposits with small loans. Based on the case studies, the BankTech model does not change the bank's roles in financial intermediation. The BankTech model enables the financial intermediation process and impacts to be more efficient and widespread by the application of Mobile Internet technology to reach the unbanked and go beyond the location presence.

Do we see institutionalization or deinstitutionalization of institutional arrangements in a population of actors?

Some literature suggests that MSP branchless mobile banking facilitates the generation of a potentially very large number of complementary innovations by tapping into the innovation capabilities of external actors and functioning as a technological foundation at the heart of innovative business ecosystem. At the core of the BankTech model are linked interests for interoperability, digital payments and e-banking in China which encompass a wide range and number of players, including banks, MNOs, and third-party payment providers, with a number of key institutions such as CUP and credit bureaus that enable the ecosystem and link closely with regulators (PBOC, CBRC). In a multi-sided financial service platform, the BankTech model acts as a foundation upon which an array of firms (a business ecosystem) develop complementary products, technologies or services through the reuse of the platform components to lower costs, shorten time-to-market for service providers, and enable direct interactions between multiple customer types which are affiliated to them through the meditation role of the service platform itself. This may add to **some new attributes of financial intermediation**, such as minimizing transaction costs through matchmaking and audience making, minimizing costs through the elimination of duplication, permitting value-creating exchanges that would not take place otherwise, and enforcing innovation.

Summary

The BankTech model leverages on a banks' core capability in credit and risk management, market knowledge, customer relationships, process innovations and ICT technologies to extend offline branch operations to online operations. It helps reduce branch network operation and people costs, and ultimately expands customer reach beyond the constraints of branch physical location. The BankTech model of innovation design and diffusion in China shows how traditional banks take adaptative actions in response to the FinTech movement in the industry. Some traditional banks take a more open approach by partnering with FinTech firms to exchange data and create business synergy.

11.2.4 Institutional Diffusion: P2P Lending, Mobile Payment and Online Distribution

How does institutions diffuse happen in the branchless banking system? Firstly, IT firms surged to set up P2P lending platform due to low market entrance barriers and fast cash accumulation. These P2P lending platforms effectively "adopted" the "Lending Club" model in the US to China. However, the lack of supervisory framework for P2P lending in China led to increased platform fraudulence, funds embezzlement and bankruptcy. Industry players (P2P firms) are consolidating and revitalizing to restore market confidence, leading to the diffusion of cooperation with traditional banking. Secondly, third-party payment platforms have become a new form of mobile payment for utilities settlement, online purchase, restaurant payment and convenient store shopping. New methods such as QR code payment is widely used and accepted by the Chinese consumers. Industry players (IT firms) inventing mobile apps utilizing mobile payment convenience lead to the diffusion of O2O (online to offline) business model. Thirdly, the online distribution of financial products surged following the success of Yu'e Bao (an online MMF on Alibaba platform). MMFs provide an alternative investment options to online consumers with higher-than-bank interest yield. Traditional banks impose limitations on daily funds transfer to online platforms. A new form of institutional diffusion emerges when industry players (IT companies, traditional bankers, telecom operators and asset management firms) collaborate to distribute WMPs over the mobile Internet by consolidating their unique resources in users traffics, product design and distribution channels.

11.2.4.1 P2P Lending Diffusion in China

In the first half of 2015, there were about 2,000 P2P lending platforms with an estimated total turnover of RMB 300 billion in China. P2P lending has experienced a fast growth in the size and number of platforms since 2013. Some P2P lenders were essentially loan sharks that utilized the Internet to access funding. Some scaled up their operation via telephone sales and started competing with incumbent microfinance companies. Some P2P lenders started to form alliances with microfinance companies using the P2P funding model and lending know-how. This has turned P2P platform from "facilitation of micro-financing" into potentially "illegal fundraising and shadow banking". Some P2P lenders circumvented the PBOC restrictions on bank lending to finance local government and real estate development projects. These issues

are a result of the lack of a clear regulatory framework over P2P lending which allows the incumbents to take advantage of the regulatory arbitrage. To curb the risk explosions from P2P lending, the Chinese authorities issued the "Notice on Warning of Risks Associated with Peer-to-Peer Lending", and new measures of regulatory framework, market entrance requirements and industry operation standards will be announced soon. The institutional diffusion in P2P lending is driven by the "opportunity taking" and "regulatory ambiguity" attitudes among the platform players. However, P2P lending also brings the benefits of inclusive finance to help meet the financing needs of SMEs. It is fair to say that P2P online lending has already become another popular platform in providing personalized financing services other than banks. The P2P lending diffusion is consistent with Lerner and Tufano's (2011) findings where they considered two key attributes in regulatory dialectic. First, many regulatory bodies have mandates that are defined by product or by institution, rather than by function. P2P lending seems to be a "no man's land" in the regulatory regime. Second, regulatory agencies lack the IT expertise to unearth the P2P lending sophistication.

The institutional diffusion roadmap for P2P lending is clear. CBRC is expected to announce new rules for the industry. Only competent lenders will survive and some of them will even thrive through cooperating with traditional financial institutions and sharing user information together, while a large number of unqualified lending platforms will be shut down one after another. With the help of new technologies and big data, P2P online lenders will gradually build their own risk management models, and some lenders might even transform themselves into professional credit rating companies. More lending models will come in place and the P2P lending industry will get more mature and further subdivided into several different sectors, each focusing on one specific area. Compared with the traditional finance industry, P2P online lending will utilize data from social media, online retailer platforms and search engines, build a database of its own, and provide financial management services that are much more convenient and user-friendly. With the introduction of new rules, some major online lenders will have to take risk management into consideration to remain in business. There will be growing cooperation between banks and online lenders. More venture capital investment, mergers and investment in the online lending industry are expected to come. In short, **the P2P lenders' institutional diffusion occurs through a regulative process of change. The regulative process specifies the governing norms, values, and routines in the institutional arrangement. This regulative dimension of institutions helps set the institutional "rules of the game" and address the institutional "dos and don'ts" among actors in the industry.** An example of regulative institutional change is documented by Scott *et al.* (2000) on how

federal regulatory changes and the differentiation of medical specialties had the unintended effect of eroding the sovereignty of physicians, changing the field of medicine profoundly. The resulting transformation is captured best by the contrast between an older model of doctor and patient and the newer health care provider-consumer relationship.

11.2.4.2 Mobile Payment Diffusion in China

Mobile payment becomes a new form of payment for utilities settlement, online purchase, restaurant payment and convenient store shopping. New methods such as QR code payment are widely used and accepted by Chinese consumers. Industry players (IT firms) inventing mobile apps utilizing mobile payment convenience lead to the diffusion of O2O (online to offline) business model. After a decade of fast development, third-party payment services have expanded to traditional banking offerings, such as loans, wealth management and short-term credit. Third-party payment companies providing e-commerce and financial services poses a new challenge to traditional banks and changes the financial industry landscape due to the use of Internet technology with the huge amount of data that record users' history and habits. According to an interviewee from MYbank, "*Payments are where banking services start, as clients deposit their money in the banks primarily for the purpose of processing payments, which generates lending and remittance business. And now the mobile payment companies are taking the same track*". However, an interviewee of HSBC has a different view, he said, "*Banking services provide clients with complex financial instruments possibilities, such as cash pools and securitization. Banks have sophisticated and advanced credit modelling and sound risk management. I, however, admit that the challenge they pose to the traditional banking model is beneficial, as fiercer competition will promote the development of the banking industry and lead to better products, services and cross-domain diffusion of business models. Mobile payment companies, such as Alibaba Group, established a cloud-based bank, MYbank, offering 100% online banking services. Likewise, CCB has constructed a mobile payment platform over its e-banking portal, offering e-commerce and various mobile payment services*". Finally, not only the lenders, but also regulators need to step up to the challenges and speed up their adjustments to the new environment by upgrading regulatory rules.

The boundary between e-commerce companies and banks is increasingly blurring. It would be natural for the lending firms under the flagship of e-commerce companies to turn into a commercial bank. Meanwhile, financial institutions, such as banks and securities companies,

are also exploring Internet technology and developing electronic banking businesses, and even e-commerce platforms as a response to the growing competition. For example, CCB started its e-commerce business in June 2012, becoming the first Chinese bank to provide e-commerce services. The move came after the unsuccessful cooperation project between CCB and Alibaba Group in 2007: Alibaba Group complained that the bank was overcautious when extending loans to companies, while CCB indicated it could not get enough data on companies from Alibaba Group. This "divorce" between CCB and Alibaba Group led to the establishment of MYbank by Alibaba Group, and an e-commerce platform by CCB. The primary goal for banks to set up shopping platforms was to stabilize relations with clients, instead of just seeking profits like e-commerce platforms. CCB did not charge rents, commissions or advertising fees for stores on its online platform. Instead, it expected profits from services such as online loans and secured transactions, instead of the price differentials of the goods. Credibility is the banks' biggest advantage when developing e-commerce businesses. In addition, they have strong capital strength to support them. The existing bank operations such as settlement, clearing and credit services, as well as their IT infrastructure and outlets, will lay a solid foundation for the banks' exploration of e-commerce. Traditional banks, however, lack the creativity capability, risk-taking attitude and flat organizational structure to really perform as good IT firms/startups in the mobile payment services. By 2018, the e-commerce platform of CCB had not performed well while Alibaba's Tmall and Alipay continued to dominate China's e-commerce and mobile payment markets.

Based on the institutional diffusion patterns of third-party payment observed in China's financial services industry, in the absence of binding regulations and with strong financial incentives, mutual learning and discursive diffusion of institutional practices, together with consumer social behavioral change, are among the normative influences on the diffusion of mobile payment services in China. The case of CCB and Alibaba Group revealed four mechanism of domestic diffusion: **financial incentive**, representing the growing popularity, transaction values and profitability from online parties; **socialization and discursive diffusion** of the new activation and flexicurity discourses of QR code payment; **mutual learning of "best" practices** of big data analytics and customer centricity; and the **strategic use of Chinese government's financial innovation promotion policies** by the domestic actors. **The third-party mobile payment institutional diffusion occurs through a normative process of change. The normative process specifies the generalization to greater levels of conformity with the normative pattern of good practices or industry norms introduced by other organizations. The institutional diffusion to the normative patterns becomes stronger**

when the level of generalization by alliance members and other system members is high. For example, in their study on the circulation of management practices, Sahlin-Andersson and Engwall (2002) focused on the role of such diverse carriers as consultants, standards setters, and the business media in transporting ideas to different settings, where they are selectively edited or translated, prompting institutional change.

11.2.4.3 Online distribution of financial products diffusion in China

Based on a report by PWC China (2015) on funds distribution in Asia, the rapid growth of fund products on online platforms has created significant disruption to traditional distribution channels in China. What drove such growth were the high yields offered by these funds. The platform owners generate returns by investing in products including cash, short-term commercial papers, bank deposits, short-term bonds, central bank notes, bonds, asset-backed securities, and MMFs. Online platforms are facing closer scrutiny from such authorities as the PBOC and CSRC. Governance issues such as KYC, AML (anti-money laundering), risk management and consumer protection are areas with tightened control. The real challenge for online funds is their capacity to offer more sophisticated products as the market develops, while containing risks and managing customer expectations. Despite these potential constraints, online platforms continued to lead the market in terms of service innovation. Consumers are not only attracted to the investment returns offered by online funds but also value the ease and convenience of transacting with a platform they trust. As the market matures and demand grows for more sophisticated products, investor education will be key to winning new business. A joint effort by industry and government to educate the wider public is critical to moving retail investors away from a "stock picking mentality" towards an "investment mindset", commented by Sean Colvin, a PwC consulting partner, in the report.

"*The emerging Chinese affluent class, a market segment consisting of more than 30 million people with total investable assets between USD 50,000 and USD 500,000, faces problems such as limited investment options, inadequate financial product knowledge, and a difficult time finding customized and objective financial advice. Technology is the key to solving these problems by combining intelligent advice with a portfolio management strategy that includes a variety of asset classes to reduce the overall risk of an investment portfolio*," said the founder and CEO of an online funds distribution platform. Chinese investor are becoming more sophisticated with knowledge about market trends, financial planning, and investment basics,

which can be a catalyst for responsible investment decision-making. Consumers are using mobile apps to invest, divest and monitor their investment funds in various online investment platform. Funds can be withdrawn or transferred nearly instantaneously and at any time of the day, not just business hours—meaning that customers no longer have to put up with the long lines for which Chinese banks are infamous. Typical users of these services vary widely, but many are young and tech-savvy enough to be more comfortable with banking through their phones than queuing at the bank. According to Alibaba Group, the average age of its famous MMFs (49 million users as in December 2015) is 28 years old, though the age with the largest number of investors overall is 23 years old. The rise of online investment platforms is giving more people access to the financial system. The much lower cost of operating a digital platform means that internet companies can afford to provide investment services to consumers that banks have previously ignored, like those of lower income brackets or in rural areas.

According to the PWC report, these changing cultures/cognitive forces of consumers are prompting a rethink of how funds are distributed and challenging the old notion that "funds are bought, not sold". Distribution will no longer be a single-step process, but a multi-faceted one with many considerations. These considerations will include investor segmentation, improving the customer experience, building stronger brand trust and loyalty, developing more relevant products and, certainly, how and where to distribute. There is an important aspect of organizational culture/cognitive difference between IT firms and traditional banks that influences the diffusion of online financial products. An industry analyst said, "*There is a huge clash of culture—banks are risk-averse, conservative and slow. A digital firm or an internet firm is just the opposite. It is very difficult to ask a banker to act and think like someone in an internet firm, but if you want to compete in that space with those internet firms, you have got to understand that culture. If banks do not find ways to compete, they risk losing some of the funding that China's tightly controlled financial system has traditionally channeled to them*." In my opinion, instead of fighting to introduce higher rates that make lending unprofitable and put solvency at risk, banks and technology companies should take advantage of each other's strengths: the tech sector's ability to innovate and access new customers, and the banking industry's long history of fund management capability. **The institutional diffusion of online financial product distribution occurs through a cultural/cognitive process of change. The cultural/cognitive process specifies changes in conceptual beliefs, mental models, and interpretations of shared meanings when institution goes through a significant change in actors' mindset or world view "from picking an investment to wandering over investment**

portfolios" amongst investors and "from single-step to a multi-faceted distribution" amongst funds providers.

What are the general attributes of institutional diffusion in China's financial services industry? First, it seems that the institutional diffusion occurs through regulative change for P2P lending, normative change for third-party payment, and cultural/cognitive change for online distribution of financial products. The institutional diffusion is motivated by, amongst others, regulatory ambiguity/reform, social cultural change, financial market maturity, technology advancement, mobile internet adaptation, peers/performance pressure, market reputation and consumer financial intellectual improvement and growth of middle class. Organizations reproduce and diffuse new and attractive practices in the organization field to reap the benefits of lower transaction costs and fast-mover advantages. Focal institutional actors are traditional banks, FinTech firms, regulators and financial consumers. However, traditional banks and FinTech firms are NOT exposed to the same institutional environment in terms of regulatory framework. Due to the fast-changing and complicated IT technology, the regulatory framework in FinTech is generally lagging behind. Regulators are also taking a more tolerant approach towards FinTech innovation. On the other hand, FinTech firms lack the capability in advanced credit modelling and risk management. The rapid expansion of FinTech novelties has resulted in increasing financial fraud, scandals and bankruptcies of large FinTech platforms in recent years. Competition for scarce resources, such as human talents and advanced financial modeling technology, forces actors to imitate and conform to legitimate institutional practices of cross-domains collaboration, O2O (online to offline) convergence, big-data analytics and cloud computing development. This process represents an event sequence of variation, selection, and retention of institutional forms. As indicated by Van de Ven and Sun (2011), the greater the number of diverse variations, the greater the chance to produce innovations. The variation in an institution helps promote innovation and adaptation. The outcome is institutionalization of institutional arrangements in a population of actors. For examples, there are people and IT platforms that are specialized in P2P lending, third-party payment and online distribution of wealth products.

What are the managerial implications from the above findings? First, institutional diffusion in China generally follows a generalization pattern of repetitive sequence of variation, selection, and retention events among entities in a designated population. Therefore, the promotion of new forms of norm and practice in the entire industry shall begin with variations that shake the existing beliefs and business models. For example, the MNOs' (Mobile Network

Operators) mobile payment/banking model is successful in Kenya but failed in China. The success factors in Kenya, such as inaccessibility to traditional banking services and low intellectual levels in the population, are not immitigable in China. On the contrary, China has extensive banking networks and financial intellectuals. The vain of MNOs-based mobile banking in China is a classic case of failed institutional diffusion due to the lack of regulative, normative and cognitive processes of change to support the new form of institutional arrangement. Regulation on MNO mobile banking is trivial as the greater problems are the limited use-case for mobile wallets and inconvenience for mobile wallet withdrawal. On the other hand, IT firm-led QR code mobile payments, transfers and balance management are popular and widely used in the Chinese community because of their user-friendliness, easy cash-in and cash-out features, and wide acceptance by merchandisers. Second, understanding the institutional diffusion pattern in China helps specify the conditions under which reproduction of an institutional form occurs so that businesses can replicate the success factors. The knowledge also helps determine the rate at which it happens so that market communicators, venture capitalists and business founders can estimate the investment period and resources to withhold before an outcome can be seen. Finally, the learning also helps regulators comprehend the degree to which a new institutional arrangement permeates a field of organizations or movement, so that the appropriate legal and regulatory framework can be put in place to protect the institutional stability and interests of relevant actors.

11.2.5 Institutional Adaptation: User-centric Innovation

Background

In the early stage of China's banking system development, Chinese commercial banks generally applied an "*innovation adaptation model*" to absorb, extract and re-innovate the existing proliferation of financial services products from foreign banks. Low costs and proven results were said to be key reasons for Chinese commercial banks to continue following the innovation adaptation model instead of trying to understand the "real needs of Chinese financial consumers". In most cases, market studies were "forms over substance" and relied solely on feedback collected from front-line staff. The product innovation was conducted in the Board room by financial, risk and IT experts who often emphasized on internal bureaucracy instead of user benefits in the product development process. Within the process of NPD, it was argued that poor considerations of users' needs make such development process product-oriented rather

than user-centric. Chinese commercial banks generally took a market-led approach rather than a user-led approach in the early days of China's banking reform. The objectives were to beat competitors rather than satisfy financial consumers' real needs. This led to the low or no financial innovation phenomena in the earlier days (1970 to 2000) of China's banking system.

Why did they adopt similar institutions?

However, over the last two decades, the case studies show that Chinese commercial banks, especially Internet/cloud-based banks such as MYbank and WeBank, were increasingly adopting a user-centric innovation model in financial innovation. The aim was to produce products that are user-oriented with higher speed-to-market. Most of these user-centric products were delivered through the application of big data, cloud computing and service-oriented IT architecture. Based on the research findings, traditional banks tend to be more product-oriented, rational- in decision-making, compliance-minded and diligence-focused in financial innovation. Large commercial bankers (such as CCB and HSBC) believe that users are risk-averse, conservative and dislike surprises. In this notion, users' psychology represents hindrance to disruptive financial innovation and LCBs are not ready to invest heavily in developing a product that has no promising returns. On the other hand, private and Internet/cloud-based banks (such as Ping An, MYbank and WeBank) are inclined to apply technology to penetrate niche (and long tail) market that is not served well by LCBs. They are generally leaner and more economic in operation. The low costs of failure encourage them to take risks and become market leaders to offer innovative products for targeted groups of users to avoid direct competition with LCBs. They tend to be more user-centric, service-oriented, technology-driven and collaborative-motivated in financial innovation. Their user group are middle-class income group, SMEs and young startups who have more technology savvy and risk tolerance, and value convenience over security. In this notion, the open-minded users' psychology represents a catalyst to the user-centric, service-oriented and sometimes disruptive innovation. From the case studies, participants generally agree that China's banking system is transforming from a product-centric development mode to user-centric product development one.

The case studies suggested that user-centric innovation is a new norm and standard in all user-facing product development processes. Operators in China's banking system, especially the traditional banks, are confirming or adapting to the standard norms, beliefs, and rules of "user experience comes first" in the institutional environment in order to achieve legitimacy, which enables them to acquire resources and improve their chances of survival. The new legitimacy was brought by changes in user expectations for banking products from "financial intermediary" to "the convenience of anywhere, anytime, and by anyone". The state policy is

also promoting user-centric innovation with the notion of "financial inclusion" for the unbanked low-net-worth individuals and unfinanced SMEs for tailored banking experiences and solutions. The reduced structuration in the industry also helps promote creativity, innovation and institutional entrepreneurship, which is consistent with findings from Scott *et al.* (1999). As explained in Chapter Two, China's banking system transformation showed an **institutional adaptation** movement in relation to user-centric innovation development in which there were noticeable changes in the characteristics of institutional actors (operators, regulators and consumers) in response to institutional arrangements (the user experience first movement) in the organizational environments (Van de Ven and Hargrave, 2004).

How do individual organizational actors adapt (proactively or reactively) to institutional environments?

At the heart of user-centric innovation is a rigorous process to understanding who the customers are and what they need. It focuses on developing better ways of communicating value propositions and delivering quality experiences to real users. It is essential for frontline employees to be at the center of the user-centric innovation process. Simply put, user-centric innovation propels the innovation effort away from experts at headquarters to those closest to customers. At MYbank, the product team identifies core customer segments and develops mutually-beneficial value propositions, which represent the complete user experience, including products, services, and any interactions with the bank. Having identified this core, the product team then systematically identifies sub-segments, sharpening the alignment between customers' desires and the bank's offerings and generating additional touch points. At the same time, the product builds the capabilities (the organizational infrastructure, customer insight, technology, communications, and field sales operations and logistics support) around current infrastructures to create, communicate, and then deliver the new value propositions to the targeted user segments. Following that, MYbank either extends its capabilities to attend to the needs of core segments or identify liked-segment where current capabilities can be deployed. There is a recursive process to identify customer needs, develop customer-centric offering, exploit the firm's capabilities to meet new customer desires, and explore the needs in new market segments.

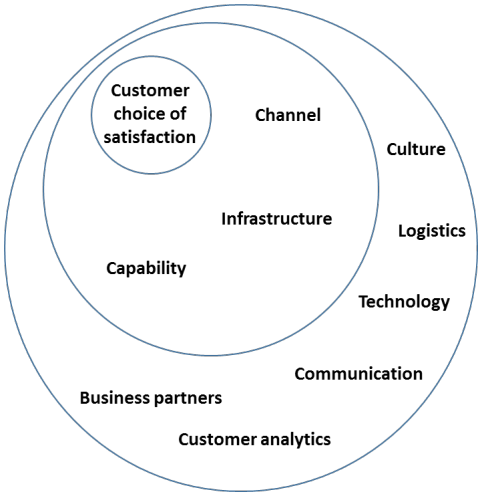

Figure 11-8: The user-centric innovation model

Source: The author's analysis

How do the case banks adapt to their institutional environment?

In the user-centric innovation model, MYbank, for example, pays close attention to disruption threats from competitors. The product team aggressively scans for early indications of shifts in users' needs or growing dissatisfaction with the value propositions on the market, especially in the underserved segments of traditional banks. Shifts in users' expectations can precipitate a need for new value propositions and capabilities. The product team also actively scans for changes in technology and regulation. Large commercial banks may not able to meet certain users' needs because of technology, use-case, product or critical mass constraints, but an alternative solution may exist. MYbank is investing in new technologies, partnering with other companies through co-creation, joint ventures or strategic alliances, and engaging in mergers and acquisitions to respond to threats from rivals and change in users' expectations. The keys to user-centric innovation success are (1) the ability to discern which users are profitable and which are not; and (2) the ability to institutionalize user centricity by making user segments the basic business units of the company. The institutional rearrangement at traditional banks shifted reactively from "disbelief" to "the need for some actions" based on the change model proposed by Greenwood, Suddaby, and Hinings (2002). Besides, some reinventions happened at different case banks to modify an innovation to fit their local implementation settings, which helped facilitate the tailoring of an innovation to meet the organization's specific needs and constraints (Rogers,1995). For example, the case studies suggest that MYbank and WeBank show a high degree of density toward the user-centric innovation model, while CCB is on the opposite side of the continuum with its legitimacy constraints as a state-owned bank. With its insurance organizational trajectory, Ping An is more

ready to tailor-make its products/services to cater to user needs. HSBC, on the other hand, is constrained by its hierarchical and risk adverse culture. To facilitate the transformation, CCB established a technology and data sharing partnership with Alibaba. Ping An invested in a new FinTech firm (Lufax) for online asset trading and wealth management. In comparison, HSBC acquired China's Bank of Communications to understand and tailor its offerings to the local market needs in China.

What is the coercive, normative, and mimetic processes (or sequence of events) of internal organizational adaptation and change?

Coercive pressures are those that come in the form of force, persuasion, or the invitation to collude. These might be government mandates or industry standards. Mimetic pressures are found when an organization feels compelled to respond to uncertainty by mimicking another organization. Normative pressures are exerted by professional networks, which diffuse organizational norms developed at universities and other training institutions (DiMaggio and Powell, 1983). The user-centric innovation movement showed a blend of coercive, normative, and mimetic processes as we have seen in the case studies. However, since banks operate in a highly-regulated environment, formalize their organizational structures, share common practices, and copy-and-diffuse innovations regularly across organizations, the driver for high institutional isomorphism is mimetic isomorphic pressures to avoid uncertainties and regulatory dialectics. The following paragraphs explain the mimetic process used by the case banks in their institutional adaptation process to gain legitimacy. Organizational isomorphism (the degree to which organizations adopt similar structures, strategies, and processes) is a significant predictor of organizational legitimacy (the acceptance of an organization by the external environment) (Deephouse,1996).

MYbank uses user behavior and real-time transactions analysis to identify user requirements and credit standing. It applies cloud computing and big data analytics for individualistic analysis. Based on this, tailored-made product and pricing are developed for specific users. The credit score and price discrimination can be applied to a specific user based on the risk and costs in providing the financing. As opposed to MYbank, most traditional banks can only perform large-volume segmentation analysis. They can identify the needs and pricing for specific user segments, but not individuals. Therefore, traditional banks can only offer segmented financial products but not customized products. Ping An is moving away from the product focus to a total user focus concept of "One Customer, One Account, Multiple Products, and One-Stop Services", where activities are conducted in parallel by cross-functional teams, with user centricity as the core. For example, by constructing an integrated FinTech service

platform “Orange E Network” for its corporate clients, Ping An leverages on the e-commerce trend to develop a user-centric innovation model through intragroup collaboration, cartel, business alliance and e-government alliance. However, it can be said that Ping An is in the early stage of user-centric innovation to identify common/overlapping needs for its insurance, bank and security customer segments to cross/up selling.

As a large foreign bank, HSBC has a certain level of user involvement and contribution in the innovation process, starting from idea generation, conceptual design, product testing to pilot use of innovation products. Aligned with its core values of integrity, trust and excellent customer service, HSBC aims to invest in and develop a customer-centric business model, which includes offering seamless customer experiences, excellent customer services at branches, and a CRM system that can support one-to-one customer sales and service. The customer centricity at HSBC is concentrated on customer experience and services innovation, rather than new product/service development. Finally, CCB, a large Chinese commercial bank, has a product-oriented innovation model. Innovation ideas or requirements are collected from several sources including front-liners, key customers and regulatory changes. All these innovation ideas or choices are weighted against development cost and future benefits by the central product development team, first individually and then collectively. The recommended choices are then proposed to the NPD committee for endorsement at HQ level. The innovation process (concept, features and value propositions) is conducted centrally at HQ by in-house experts in finance, credit modeling, IT and risk management. The many forms of innovation include new products, improvement to the existing products, product features, customer segments or product usages.

What are the institutional environmental beliefs, pressures, or regulations to which organizational actors must adapt to be legitimate?

User-centric innovation is depending on China’s ICT (Information, Communication and Technology) development and mobile Internet user base. In this context, commercial banks in China are constantly monitoring and evaluating new ICT service ideas against their strategic business goals. User-centric innovation relates to customer interface, experience, touch points and exchange. The innovation can be automated, self-serving, radical and incremental innovations which link to the firms’ customers, their future satisfaction and retention. User-centric innovation also relies on the firms’ employees to deliver high-quality and integrated services. Employees that are involved in innovation activities include business developers, IT engineers, innovation captains, middle managers and front-liners who are involved in service delivery. The case studies of MYbank, HSBC and Ping An show that organizations’ adaptation

to the institutional arrangements can not only help them gain legitimacy and comply with technical standards, operation rules and regulations, but also help uplift the operation efficiency and technical alignment of the incumbent (Meyer and Rowan, 1977). For example, HSBC adapted to China's online consumer environment by establishing its WeChat official accounts and mini program. HSBC also set up an online banking department to study and adapt its products and services to match the expectations of financial consumers in China. There is no question of "adapting to survive" in the user-centric innovation movement.

What are the organizational legitimacy outcomes by adopting isomorphic institutional arrangements?

The findings of this study are consistent with Costanzo and Ashton's (2006) finding that financial innovations mainly emphasize on "speed-to-market" and the ability to "adapt quickly" to changing market conditions, with a primary objective of satisfying the customer needs. The concept of innovation is more process-oriented rather than product-based. Bankers are extending their "reach" or increasing their "capability" of delivering innovative financial solutions to consumers rather than R&D type NPD *per se*. As found by Vermeulen (2004), the innovation process rarely involved customers, front office personnel and intermediaries in the product concept development. The user-centric innovation model also helps overcome financial innovation issue of "build to sell" rather than "follow the customer and make for sell". The new business model focuses on customers, not necessarily the products or services, and is also a new approach to the method. The changes must be supported by the organization's own rewards system, leadership behaviors, the motivation and open approaches. The research findings support the **theory of consumer choice**. The theory of **consumer choice** is the branch of microeconomics that relates preferences to consumption expenditures and consumer demand curves. It analyzes how consumers maximize the desirability of their consumption as measured by their preferences subject to limitations on their expenditures, by maximizing utility subject to a consumer budget constraint. The idea behind consumer choice theory is that consumers will try to purchase the products that will give them the highest levels of benefit or enjoyment for the amount of money that they can afford. The aim of user-centric innovation is to maximize consumer choice of satisfaction with cost-effective and user-friendly financial products/services. Based on the **theory of consumer choice**, banks shall restructure their innovation focus from making products around their capability to developing capabilities/novelties cantered on customer needs. In a more structured organizational field, there is less room for autonomy and innovation.

Summary

The user-centric movement in China's banking system shows an institutional adaptation phenomena or story as to how the case banks conform or adapt to the standard norms, beliefs, and rules in the institutional environment in order to achieve legitimacy, which enables them to acquire resources and improve their chances of survival. The case studies indicate that the case banks' responses to institutional pressure vary in terms of adaptation and reinvention. In particular, the level of "adaptation pressures" within each case bank and the level of value commitments determine the way they respond and adapt to institutional environmental pressure or rearrangement needs. In short, organizations do not simply react in the same ways to institutional adaptation. They respond differently and are contingent on various strategic and organizational conditions. It is, therefore, interesting to study the institutional innovations that are developed externally, namely, financial technology and platform economy, and are imposed on existing players such as traditional banks, and how they adapt to the institutional environment change brought by the regulatory, technology and social movement changes.

11.2.6 Collective Actions: Cross-industry Co-creation in China

Innovation in financial services takes many forms and shapes, but most of them are conducted in-house using a project approach. This can be explained since financial innovation is highly regulated, prioritizes risk and compliance, relies on financial modeling sophistication and banking system platform bonding, and is largely influenced by the service offering architecture of the bank. A review of the existing literature shows that open innovation is getting important and becoming a new trend in the banking sector. However, decision of a financial institution and its partner to cooperate with each other in the open innovation framework is based on anticipation and evaluation of the expected benefits and costs of the joint innovation effort. Not much is known about the cooperation models as well as perceived advantages and disadvantages of open innovation in the financial service industry. Understanding these issues is important to the innovation partners and participants because this may eventually reshape the financial landscape of the institutional field and induce institutional change. Regulators, more specifically, are concerned about the lack of clarity in the market, credit and operation risks from these joint/open innovation platforms. New regulatory framework is required to address the inherent risks from these "connected-interests" to avoid systematic financial risks and protect the interest of financial consumers. The literature shows that there is little research on open innovation in financial services, especially in the case of financial institutions cooperating with IT firms to develop new products or processes. In fact, the development of "FinTech" and

"Internet +" in China shows that collaborative innovations by banks and IT firms are blossoming and both can benefit from the cooperation from leveraged complementarities, cost reduction, time-to-market, gaining stronger creditability and access to partners' networks.

This form of co-creation is driven by constraints of the traditional finance business models, consumers' changing financial habits and relaxed regulations. First, traditional banks with asset-intensive and business models of high operating costs are facing narrowing interest margin and increasing client demands for better service efficiency and user experience. Restricted by their organizational trajectory, traditional banks are forming alliances, strategic partnership, JVs or acquire IT firms to beef up their innovation and development capabilities in FinTech. Second, Chinese consumers are embracing FinTech at a great speed. They are getting more sophisticated with quick adaption to online wealth management and online finance products over the mobile phone applications. Despite growing enthusiasm for digital finance, online channels cannot fully replace conventional channels. Some consumers are hesitant to purchase wealth management offerings online, citing a lack of real-time and face-to-face human support as the main reason. In business areas where in-depth interactions between bank staff and customers are valued, physical branches remain irreplaceable. Therefore, FinTech should complement traditional banking, rather than merely copy or replace them. In fact, FinTech firms rely on traditional banks' extensive branch network for consumer cash-in and cash-out. Therefore, there is more and more collaboration between IT firms and traditional banks in forming digital direct banking.

For example, CITIC Bank (a large commercial bank) and Baidu (a large IT firm) have established alliances to form a new direct bank. Third, currently, there are only a few regulations governing FinTech activities. Regulators are studying the sector now, but all signs suggest that the government will take an open and liberal view, allowing the proliferation of many different growth models. In July 2015, the regulators issued the ***Guidance Opinions on Promoting the Healthy Development of Internet Finance*** to define the supervisory structure and governance approach for each type of FinTech businesses. Many companies, including Alibaba and China Minsheng Bank, have been adapting their business models to meet customer needs in noteworthy ways. Some use online channels to successfully generate traffic and acquire target customers, some use online channels to create an ecosystem for their core customers, and others integrate digital elements into their product design. For many traditional banks, developing digital finance requires a new skill set. The same is true for FinTech firms. To achieve success, both need to complement, not compete, the needed skills of each other.

Cross-industry innovations emerge when companies integrate or license technology which

is already established in their own industry but new to another industry. It is an effective way to leapfrog an innovation effort by drawing analogies and transferring approaches between contexts, beyond the borders of one's own industry, sector, area or domain. As elaborated in Chapter 4, an increasing number and various forms of co-creation among traditional bank, IT firms and industry player are observed in China following the Internet+ model gains popularity. Co-creation (of new products, services, sales channels or business models) can benefit the institutional actors by sharing tangible & intangible resources to enable a new business model, lower the entrance barrier, reduce risk and establishment costs. Co-creation also helps create new synergies in terms of customer base, technology and operation skills amongst the participative partners.

Some examples of co-creation through strategic partnership or business alliances (just in the year of 2014):

1. On October 13, 2014, Bank of Suzhou and Dianrong.com announced to jointly build an FinTech platform focusing on serving more than 79 million users in Jiangsu Province. Bank of Suzhou would set up a dedicated P2P department, while Dianrong.com would build the P2P platform, providing the technology and related products and services. The platform was expected to be operated jointly. Such a close level of collaboration between a traditional bank and a P2P platform was the first of its kind in China.

2. On September 29, 2014, CBRC formally approved the establishment of Zhejiang Internet Commerce Banking, which will provide financial services for micro enterprises and individual consumers and over the Internet. Its business model is to take deposits and extend borrowings in small amounts, namely, deposit products of less than RMB 200,000 and loan products of less than RMB five million. It is a joint venture (JV) of Fosun Industrial & Technology Group, a micro financial service provider, an IT platform, and an asset management company.

3. In Q2 2014, Sina.com launched a portal called micro-fortune. It is a web-based platform for selling high-quality financial assets directly to individual investors supported by SINA Payment. It is a JV of Sina.com, an asset management company and a micro-finance provider (Sina 2014 Annual Report).

4. In Q3 2014, Fang Jin Suo, a leading real estate services company in China, announced the establishment of a JV between SINA and E-house. The new JV provided loan products guaranteed by insurance companies, micro-lenders, and real estate developers themselves. China's central bank required real estate buyers to put up 30% down-payment for any loans

from commercial lenders. This opened up a market valued at USD 16.4 billion in 2014 to online lenders such as Fang Jin Suo (Sina 2014 Annual Report)

5. On August 5, 2014 China Telecom launched its first financial investment product, "Tianyi Bao", partnering with Minsheng Bank to release MMF, currently offering a 4%-7% annual yield. Premium-level verified users on the BestPay platform may apply for the Tianyi Bao service through the BestPay mobile app. Users may apply interests accrued from the product towards their mobile account balances, as well as receive free data from China Telecom for investing in Tianyi Bao (China Telecom 2014 Annual Report).

6. On July 10, 2014, Baidu announced its cooperation with China Unicom and Fuguo Fund to launch an internet money management and local life service business called "Wo Bai Fu". In this co-developed online wealth management platform, the Fuguo Fund provides the product design and risk management, Baidu provides the online technology and user profile, and Unicom supports product promotion and provides distribution channel over its network.

7. In early 2015, Chinese smartphone maker Xiaomi rolled out a new MMF product, HuoqiBao in collaboration with E Fund Management, one of China's largest wealth managers. HuoqiBao mimics the key features of the majority of Internet-based fund products by offering investors higher interest rates than traditional Chinese bank deposits and providing cash on demand. It is accessible via an app pre-installed on Xiaomi devices. According to Xiaomi, it planned to offer personal lending and securities brokerage in the near future.

Some examples of co-creation through business or talent acquisitions (just in the year of 2014):

1. JD Finance: JD.com was the second-largest B2C e-commerce company in China, with a 19% share of the overall B2C market, after Tmall's 61% of market share. JD.com became one of the leading players in FinTech after October 2012, with the acquisition of third-party payment portal Wangyin Zaixian (网银在线), which changed its name to JD Payment in April 2015. In November 2012, JD.com launched Jingbaobei (京保贝), a financing service for its suppliers, which promised a quick financing approval process. In July 2013, JD.com announced the establishment of JD Finance Group. Since then, the company has become an online financial service provider as well as an e-commerce platform player. Currently, the core businesses of JD Finance in FinTech include mobile payment, supply chain finance, P2P loan and crowdfunding. The most recent movement of JD.com in FinTech was its partnership with ZestFinance, a U.S credit-scoring technology company. The two companies formed a joint venture called JD-ZestFinance Gaia to offer credit service to consumers, particularly those with limited or no

credit history.

2. Wanda Crowdfunding: Wanda's acquisition of a third-party payment services company, www.99bill.com in December 2014 was an important milestone of the group in entering the FinTech sector. Wanda then launched its first online investment product, "Stable Earner No.1" in June 2015 to help finance the construction of its next batch of shopping malls. In July 2015, the group further consolidated its financial arm by setting up a financial holding group which focuses on "Internet plus" finance. Apart from the existing crowdfunding, investment and mobile payment services, the company plans to enter the banking, securities and insurance segments.

3. Through talents acquisition, BOC continued to diversify and improve its e-banking service channels, including online banking, mobile banking, WeChat banking, telephone banking and home banking. It accelerated the integration of physical outlets and electronic channels and optimized product features and operating processes with the aim of continuously enhancing customer experience. In the first half of 2014, BOC's e-banking transaction volume reached RMB 66 trillion, a year-on-year increase of 29.71%. The substitution ratio of e-banking channels for traditional outlets continued to increase and e-banking customer base expanded rapidly. BOC actively promoted e-finance bank construction, continuously improved its open platform, and launched innovative services including online wealth management, "Financial e-Manager", "e-Home", online cross-border financial products. BOC's "Future Bank" flagship branches achieved preliminary development.

Over the past year, the government has been supportive of FinTech development. In March 2014, Premier Li Keqiang said at the 12th National People's Congress that China would promote the healthy expansion of Internet banking. On March 5, 2015, Premier Li reinforced again the concept of "Internet Plus" and made FinTech the national strategy in his Government Work Report 201530. Under the Internet Plus action plan, FinTech was set to become one of the focal points of development. On July 19, 2015, ten central government ministries and industry regulators jointly issued the Guidance on Supporting the Healthy Development of FinTech. It categorized FinTech into different business sectors and placed each sector under the supervision of a specific institution. The central bank was required to oversee mobile payments, CBRC to supervise online lending and P2P platforms, and CSRC to be responsible for crowdfunding and the online sale of funds. The key highlights of the Guidance include: (1) Encouraging development of innovative products/services and supporting steady growth of FinTech; (2) specifying regulatory responsibilities and providing proper supervision for each type of FinTech business; (3) establishing a sound market order and discipline. It was believed that the Guidance

will foster a healthy market through closer government supervision. The whole sector was expected to be reshaped as unqualified players got kicked out.

Based on the above analysis, the co-creation in China is established through:

(1) Business collaboration or partnerships between two or more large institutions. For example, China Telecom partnered with Minsheng Bank to release an MMF "Tianyi Bao" on its BestPay platform.

(2) Merger and acquisition of institution(s) by another large institution for resources such as talents, IT platform or business legitimacy. For example, Wanda acquired 99bill.com (a third-party payment firm) to venture into FinTech and crowdfunding operations.

(3) Large institutions' organic growth through reallocation of internal resources to a new institution to develop a new set of business models which are closely linked or leverage on the parent institution's capability. An example is the establishment of MYbank (a cloud-based bank) by Alibaba Group (an online e-commerce platform).

What are the attributes of collective action institutional change in the Chinese financial service industry? Based on the above analysis, it is clearly shown that there are **networks of distributed and partisan actors (banks, IT firms and industry players) in the inter-organizational field which are embedded in a collective process of creating or revising institutions. The impact on institutional arrangement can be game-changing.** For example, Wanda is revising its financing strategy from bank borrowing to crowdfunding for its commercial mall property development. The impacts are several-fold. Firstly, investors would be able to participate in the direct financing of the real economy with a low threshold, which also enables them to get a return on investment without the middleman. Secondly, all money is directly linked to the investment project, from online to offline entities. It is the only real development direction of future FinTech that is going back to offline and realizing the dual advantages of industry and finance. Meanwhile, Wanda also shows that crowdfunding with 99Bill cannot be understood as fundraising by Wanda Commercial. The investor's return on assets consists mainly of rental income. Wanda Commercial is only responsible for site selection, design, construction, investment attraction and management, and will obtain 30% of earnings from the rent. As is typical of Wanda Commercial's asset-light business model. The company will follow an "asset-light" strategy for its growth, seeking outside investment to finance the plazas and selling them off after five or seven years.

What are the antecedents and consequences of institutional change in the collective action efforts? The collective action is triggered by the recognition of an institutional problem,

barrier, or injustice among groups of social or technical entrepreneurs. For example, the institutional problem for financial innovation in China is that the traditional banking sector lacks the motivation and capability to explore and exploit new financial products, services, channels, processes and business models. But this institutional environment is changing, when the interest margin gap is narrowing and FinTech adaptation is wide-spreading, such as online MMFs, crowdfunding and real-time money transfer by third-party payment operators. This institutional environment change has triggered cross-industry collaborative co-creation formation of new institutional arrangement. As consequences, new institutions are formed, rules are re-written and regulatory framework established to enable the healthy development of this new institutional arrangement. Collective political events deal with processes of framing and mobilizing structures and opportunities for institutional reform. Political events such as the 2nd World Internet Conference held in Wuzhen, issuance of the Guiding Opinions on Promoting the Healthy Development of Internet Finance and TV programs on financial innovation promotions advocate an institutional change collectively for a systematic reform of business model and operating system, calling for institutional collaboration and sovereignty to build an ecosystem of financial innovation. It clearly shows that the Chinese government is leading institutional reform by actively promoting financial innovation, reframing the governing legal framework, mobilizing institutional structural change through tax incentives and legal support, and creating opportunities for collaboration through international conferences and domestic seminars/workshops. The outcomes are institutional precedents, new or changed work rules and institutional innovation.

What are the managerial implications from the above findings? First, institutional collective action usually results in massive changes or the new formation of institutional arrangements. Therefore, it can be very costly and time-consuming and has widespread effects. And, in most cases, this type of institutional change, as we see from the above analysis, is trigged by an institutional problem/issue that affects the majority of the institutional actors which require collective action to restore or reform the institutional arrangement to achieve new values or mitigate injustice. Simply put, the rules of the game in the business have changed and therefore require a re-arrangement of institutional actors' interests and operation protocol. In this context, the government plays a very important role in reforming the legal framework, mobilizing changes and ensuring fairness in the new institutional environment. Second, institutions shall proactively acquire new resources by forming strategic partnerships/alliances or through political negotiations so as to withstand the changes and become more competitive in the new institutional environment. Institution may involve in the establishment of

institutional precedents and work rules through participation in the legal framework formation or consultation process. Early knowledge, preparation and participation in the collective action institutional change may provide an institution with more comparative advantages compared to the late comers.

What are the advantages of cross-industry open innovation in financial service industry? Based on the case studies, CCB and Ping An have established cooperation with FinTech firms for FinTech collaboration. They require ICT expertise, user-centric innovation, and a flexible organizational mechanism to fully exploit the FinTech opportunity. They are partnering with FinTech firms to leverage complementarities and shorten the learning curve. Interviewees from CCB pointed out that they established financial innovation collaboration with Alibaba back in 2007. The selection was based on the overall contribution of the partners to the overall strength and scale of the collaborative solution. Second, one of the Ping An interviewees stated that the cost reduction was the goal for cooperation or acquiring a FinTech firm to develop a new financial service solution. The cost-driven logic aligns well with the existing literature on transaction-cost theory. For example, Ping An acquired a third-party payment firm and an online used-card IT platform firm to gain immediate access to third-party payments and e-commerce businesses at a low market entry cost. By cooperating with the external partners for development and deployment of novel financial solutions, they benefited from a shorter time-to-market advantage. The crucial point to compete in FinTech, when financial innovation is not patentable, is to rapidly develop overriding solutions in the emerging and borderless competition. Two interviewees of MYbank stated when entering the FinTech markets, they leveraged on Alibaba's e-commerce platform to reach large customer segments in a short time.

What are the disadvantages of cross-industry open innovation in financial service industry? The case studies suggest that both traditional bank and FinTech firm encounter problems in cooperation with each other. First, an interviewee from FinTech firm complained that banks are rigid when it comes to risk and change management, which impedes prompt and flexible market mechanism required in FinTech model. This echoes with the existing literature which points out that bureaucracy and conflicting rules in cooperation for innovation are obstacles to open innovation. The FinTech firm also complains that banks are too risk-averse and creditability-seeking. LCBs have security concerns over the technical integrity of smaller FinTech firms. Besides, in most cases, the bargaining power is on the bank side. The cooperation model, characterized by an imbalance of resource stocks, is problematic. Several interviewees admitted that cooperation with external partners entails considerable

communication and coordination costs, especially when the balance of interests is not optimized. Almost all interviewees agree that the most important issue of their cooperation with external partners was goals incongruence. In the cases, where the strategic alignment of objectives was not reached or subsequently changed among partners, cooperation appeared to be problematic or counterproductive.

What suggestions can be provided to the financial innovation openness in China? First, financial service providers opting for a higher degree of opening in innovation management should instill organizational culture change to admit the innovation partners' novelties and contributions. Using the bureaucratic and hierarchical structure to operate FinTech and cross-industry open innovation process is not appropriate. Banks shall consider setting up an independent entity to cooperate with external partners. This "startup" shall be run by a separate team independent from the daily transactional banking operations. The startup has a more fluid mechanism to explore and exploit different innovation ventures with risks contained within a separate arrangement through proper contractual agreement. Second, FinTech firm and industry players cooperating with LCBs shall consider their resource stocks and bargaining power in the collaboration innovation. Intellectual property rights, revenue/profit sharing schemes, resources contributions and risk absorptive arrangements shall be well-documented in the collaboration agreement. FinTech firms and industry players shall consider forming a strategic alliance and increasing the market influences and resources importance before cooperating with LCBs. Finally, finding a proper balance between closed or open innovation activities is crucial for not only the banks but also the collaborative partners, which operate in other sectors of the economy. Institutional field and institutional changes shall be addressed at both industry level and organizational level considering the inherent peculiarities of the sector involved.

Based on the case studies, it seems MYbank has the highest-level innovation openness in both inbound and outbound knowledge sharing. MYbank, as a cloud-based bank, has already adopted the platform economy principles from its parent Alibaba. When speaking to the product manager of MYbank, the willingness to accept new ideas, criticism, contributions and resources exchange in both intragroup and inter-organization is regarded as a key source of its innovation creation. Ping An, on the other hand, has been engaged in open innovation since 2012 by investing in an online financial derivatives platform and developing strategic alliances with many industry players to offer new products in various portfolios including auto market, housing market, e-Payment and mobile social finance. In 2014, Ping An set up an RMB one billion VC (Venture Capital) fund to invest in new ideas and startups in financial, consumption, healthcare, automobile, social network and AI sectors. This VC fund acts as an open innovation

sourcing radar for Ping An. CCB established strategic alliances with Alibaba in 2007. The collaboration includes designing and developing financial products for micro-financing, trade and supply chain financing for online traders and consumers on Alibaba's online purchase platform. Meanwhile, CCB also established collaboration arrangements with various external partners for its online financial marts to provide services including utilities payment and online purchase. HSBC, due to its risk-adverse business culture, does not seem to be "open" to external collaboration for innovation design and creation. By reviewing HSBC's financial products and data collected from the case study, all innovation at HSBC is conducted in-house and centralized at group level. There is very limited openness in HSBC's innovation activities.

Many puzzles are still unresolved in China's financial open innovation model. What are the sources of financial open innovation? What are the factors driving the financial innovation openness? What are the major antecedents and consequences of financial open innovation? What facilitate and constrain cross-industry co-creation in China? What are the risks to the financial consumer protection and financial system stability when the economy is overly connected by open innovation? All these questions are important for us to understand and manage the financial open innovation process and implications. Further research and empirical data collection are required to address these questions.

11.3 Summary

This section discussed the financial innovation findings in relation to financial innovation process, regulatory dialectics, customer-centric innovation, branchless (mobile) banking and open innovation (or cross-industry co-creation, more specifically). The discussions were mainly based on empirical data collected from case studies and the author's analysis. Several interesting findings were identified from the case studies. Specific attributes, advantages and disadvantages, and suggestions for further improvement for each of the innovation findings were discussed in detail. The author also pointed out the many issues or research questions to be addressed with more comprehensive data collection in further research.

Chapter 12: Discussions and Conclusion

This chapter discuses and concludes findings from the case studies, within and cross-cases, with an emphasis on contributions and implications to theories development, research design and industry practices. Limitations of this study are pointed out together with suggestions for further research. Finally, an "overall summary" is given where the ex-post story is presented to conclude this study.

12.1 Regulation: A Catalyst or a Hindrance to Financial Innovation

The discussion of regulation dialectic begins with Kane (1977), who found that innovators always look for opportunities to exploit regulatory gaps, regulators impose new regulations, and each new regulation gives rise to new opportunities for more innovation. Based on this notion, Miller (1986) further identified a strong relationship between financial innovation and regulation. Recently, Lerner and Tufano (2011) concluded that regulatory agency is up against a world of potential entrepreneurs and innovators, who continued to exploit loopholes in the current regulations.

However, regulation is also identified as a potential hindrance to financial innovation and adds compliance costs to the banking operations. Merton (1995) found that over-regulations can hamper the "engine of innovation" and add compliance burden/costs to the financial system. Excessive financial innovation leads to complicated financial products that are associated with reduced transparency in the products and an array of choices that are difficult for consumers to evaluate. Regulation is, therefore, a "double-edged sword" as it also hampers innovation by adding compliance burdens, risk management bureaucracies and transaction costs (Mention and Torkkeli, 2012).

Based on the case studies, many of the regulation reforms toward financial consumer protection are promoting greater transparency and justice. However, all these require additional investments and operational costs in IT system, internal control and regulatory compliance. Participants at HSBC and CCB commented that, the regulatory compliance requirements and restrictions put them in a comparative disadvantage position. FinTech firms are perceived to have less stringent regulatory burden to bear. The government adopts a more "open" approach to FinTech development in China in view of their immateriality to the banking assets, at least for now, and uses FinTech firms to instill innovation at traditional banks.

To reconcile the regulatory dialectics as identified by Kane (1977), a balanced approach on financial regulation and innovation is suggested.

As pointed out by one of the Participants at CCB, "*We conduct regular dialogues with the regulator to understand the regulatory concerns and new developments. For NPD, we explain the design, logic and objectives of the new product to the regulator. We justify how the new products can help achieve the government's objectives, comply with the laws and regulators' requirements. Before we bring the products on the table with the regulator, we, of course, have internally validated the product values and mitigated any potential negative impacts to the industry and society. So far, the regulators are very open and supportive of new financial innovations and developments."*

Based on the case studies, regulation is both an innovation catalyst and as a hindrance factor. For example, HSBC is restricted by PBOC to perform certain types of RMB-based banking transactions which are open to domestic banks only but supported by government on other securitization and international banking activities. CCB has government policy support in wining large infrastructure financing projects but it is also affected by government's policy in its capital allocation process. In addition, CCB also claims that the current financial regulations impose high compliance costs on smaller banks like them.

In summary, the case studies indicate that **(1) when the bank's business strategies align with and support government policy, regulation will be a catalyst to innovation; and (2) when the bank's business strategies are against or contradict government policy, regulation will be a hindrance to innovation.**

12.2 Determinants: Financial Innovation and Performance

A lot of literature suggests that banks are more likely to innovate in response to competition and to addressing institutional challenges rather than to launching novelties which represent ceteris paribus business opportunities (Batiz-Lazo and Woldesenbet, 2006; Costanzo and Ashton, 2006;). In addition, Lerner (2006) also found that less profitable firms (high performance pressure) are more likely to innovate than their peers while reaping the fruits of their investment in subsequent years in the forms of enhanced profitability.

However, performance pressure is affected by the organizational structure and diversification. The larger an organization, the more diversified its organizational structure and

business, and the more countercyclical the firm's performance, and the less performance pressure to innovate. Some literature finds that diversification is mainly negatively associated with innovation likelihood. Vives (2001) evidences emergence of diseconomies of management and agency problems in diversified banks. Batiz-Lazo and Woldesenbet (2006) found that larger banks are more inclined towards process innovation than product innovation, as they aim to increase efficiency of operations instead of venturing into new products and markets. However, larger banks have more resources and a greater financial commitment to large-scale innovations, which also increase the success rate of their product innovation and enable them to be the market leaders in new financial products.

The case studies shown that institutions holding large market shares and operating in concentrated markets (such as CCB and HSBC) are generally adopting process innovations or product localization innovations. Young and smaller banks operating in niche market (such as Ping An, MYbank and WeBank) are more eager to engage in product innovation to expand market share. In addition, the case studies also show that organizational trajectory, bureaucracy, and technology burdens can negatively affect the innovation performance. The larger and the complicated the organization structure and innovation model, the higher compliance and communication costs on innovation (as in the case of CCB and HSBC). However, the case studies also suggest that management mandate can have a significant influence, supportive or adverse, to the innovation process. HSBC seems to have a strong leadership commitment to innovation and service excellence. CCB is facing the issues of bureaucracy, a hierarchical decision-making process, and excessive internal coordination over innovation development and diffusion.

In summary, the case studies show that **(1) large and diversified traditional banks conduct more regular process innovations to drive business alignment and work process efficiency. Exploitation (rather than exploration) product development strategy is adopted to reduce costs of development, failure and correction; (2) small-and-medium-sized traditional banks conduct more radical and incremental product innovations to drive financial performance and market share expansion. Process innovation is embedded in the daily operation through the lean organizational structure; and (3) FinTech firms use customer data, transactional records, and real-time credit modeling to identify use cases and application scenarios for NPD. The low cost of product diffusion (via digital application) allows FinTech firms to explore new product concepts more effectively in a regulatory sandbox environment where the financial market impacts can be more controlled.**

12.3 Multidisciplinary Project Team's Impacts on Innovation Performance

NPD often involves cross-functional linkages, where the participants in a team have differing viewpoints. Such teams are often characterized by their synergy as well as communication costs involved with their interactions with other team members. Interaction in a team brings out the need to organize, integrate, filter, condense and annotate the collaborative data and other relevant information that these team members contribute.

The case studies suggest that Chinese banks use a multidisciplinary project team to develop new financial innovations. The project team mainly consists of subject-matter experts from various departments. The team is formed after the management approves the initial idea. The project team members are generally involved on a part-time basis and act as representatives from their functional departments. The project manager is usually a full-time employee from the product innovation department. The project manager will spearhead the proof-of-concept, lead innovation development activities, coordinate resources and promote innovation outcome marketing. This study's findings are consistent with most of the literature on multidisciplinary project team structures applied in financial and service innovation in banking (Vermeulen, 2004; Costanzo and Ashton, 2006; Vermeulen and Dankbaar, 2002; Avlonitis *et al.*, 2001) in terms of the project management, governance structure and process.

However, based on the feedback obtained from several interviews, a multidisciplinary project team also leads to inefficiencies such as inter-team conflicts of interests, excessive communication to align objectives and tasks, overlapping duties and unclear responsibilities, as well as a large amount of time needed to manage relationships and coordinate tasks. From the case studies in CCB and HSBC, the lack of sufficient time for collaboration, lack of training in group dynamics, overlapping roles, and territorial and status conflicts are the major issues and disadvantages in multidisciplinary project team approach. From the case studies in Ping An, MYbank and WeBank, the discrepancies between the collaborators are another issue caused by their backgrounds/functions difference and conflicting priorities - between project duties and functional responsibilities - when they participate in a multidisciplinary project team. Functional diversity or diversity in backgrounds have a negative effect on group performance. The above views are supported by case studies in CCB and HSBC.

Based on the case analyses, interviewees at HSBC find that collaboration with colleagues, from different backgrounds, departments and countries representing diverse competence and experience, is highlighted throughout the interviews as a key to innovation cultivation. However, it also creates issues in communication effectiveness. CCB adopts a project management model that s basically driven by the product team at HQ. *"We need more cross-departmental and cross-location coordination to ensure a smooth end-to-end innovation and transformation process,"* said an interviewee at CCB.

In summary, the case study analyses suggest that **(1) A multidisciplinary project team is more effective when the project mandates, scope and charter are clear and accepted within an institution; (2) team outcome can be more accountable, acceptable and generalizable with better communication and coordination with stakeholders; (3) A multidisciplinary project team can improve knowledge absorption and accumulation through effective co-work and knowledge transfer; (4) A multidisciplinary project team requires additional communication costs but the knowledge creation will pay off in the long run; and (5) functional diversity facilitates a more open innovation process with integration of knowledge from different functional disciplines, whereas functional similarity facilitates an in-depth innovation process where competence in a deep sense within a single/limited discipline enhances knowledge breakthroughs.**

12.4 Customers' Involvement in the Financial Innovation: Easier Said than Done

Based on the case studies, customer contribution stands out as the key determinant for financial innovation success in all the interviews. For example, HSBC emphasizes on the ability to gain adequate market insights, identify key customer segments and develop customer-centric products. CCB focuses on comprehensive customer requirements collection, "futuristic" feature of new products, robustness of the new product design and market/customer acceptance. However, according to Vermeulen (2004), customers are seldom involved in the innovation process and products are often launched without prior analysis of customers' interests for these inventions. de Brentani and Cooper (1992) further concluded that "*most new service products are not market tested*". Costanzo and Ashton (2006) found that the innovation process is more market-oriented than customer-oriented, and thus most banks adopt the strategy to target quick launch of slightly modified offerings as a response to competition rather than to truly identify

and meet customers' needs. It clearly lacks a systematic effort to collect ideas and source information from the front office personnel as evidenced by Vermeulen and Dankbaar (2002). "*Direct involvement of customers appears extremely rare*" and may be explained by the degree of inherent complexity of financial innovation and the lack of customer interest in these innovations (Vermeulen, 2004). Although involving customers in the co-creation process may be rewarding, it is complex as customers may not be able to clearly articulate their needs (Avlonitis *et al.*, 2001).

As indicated from the case studies, again, customer or early adopter engagement is very useful in FinTech product development. WeBank and MYbank, for example, have been offering their "beta" product for internal test before massive market release. This has been very useful in collecting user experience feedback, evaluating the product's functional and risk management features, and enhancing user adoption when launching the product. However, customer interactions are generally at a low level or at the very late stage of product testing. The marketing and product development department often comes up with ideas for new products with their own analysis and market study, without knowing whether the end customers are interested in these products. Contrary to "open innovation concept", one often cites reasons for the lack of customer participation in the financial innovation process is closely related to the ability of customers to understand the complex financial products and worries of confidentiality/security leakages.

Besides, unlike consumer goods inventions, most consumers do not seem to be interested in these financial inventions, and therefore it is difficult for them to get involved. Likewise, there is little involvement of front office personnel and intermediaries too, which means that a lot of customer information is probably unused by or not reflected to the product development team. Some banks do, however, arrange special meetings with various representatives of the front office to gather ideas or ask for advice. Panel groups of intermediaries are sometimes asked to test the new service concept. Nonetheless, the degree of customer interactions or customer needs integration seems to be low in the service concept development stage. When the customer interaction is only happening at a very late stage of development, it may be too late and too difficult to alter the service concept and product specification when material issues emerge in the product testing or acceptance stage. The alteration of the content of the service concept can be very costly and time-consuming when it comes to the very late stage of development.

Based on the case studies, it can be concluded that **(1) engaging customers in the innovation process is easier said than done. Most banks still rely on in-house research**

department, external consultants and customer relationship managers to collect customer feedback for innovation; (2) customers do not have interest in or want to participate in the financial innovation process, as they may lack the technical skills to assess and articulate their needs; and (3) application of big data analysis can improve the product conceptual design and end-user usability for targeted customer groups/segments based on identified customer attributes and transaction variables.

12.5 Institutional Progression Model: A Process Approach to Institutional Change Theory

The existing literature on institutional change mostly analyzes change as "single-shot" events, or, on the contrary, as a slowly moving processes. The existing works have often overlooked the fact that change happens in bundles or in package deals, with multi-dimensions of reform happening at once. Moreover, most of the existing analyses have focused on single levels of change. Yet, many institutional reforms are intertwined, mutually-dependent and can have very consequential effects on institution actors, institutions and institutional fields. The study of these apparently multidimensional, multilayered and nested institutional change is essential, in contexts where the institutional systems are social-capitalistic, dynamic and networked.

Based on the study of China's banking reform history (over the past 20 years) and recent developments in China's banking system such as cross-industrial innovation, branchless banking and user-centric innovation, a theoretical model is constructed as follows to explain the apparently multidimensional, multilayered and nested "institutional progression model" in China's banking system.

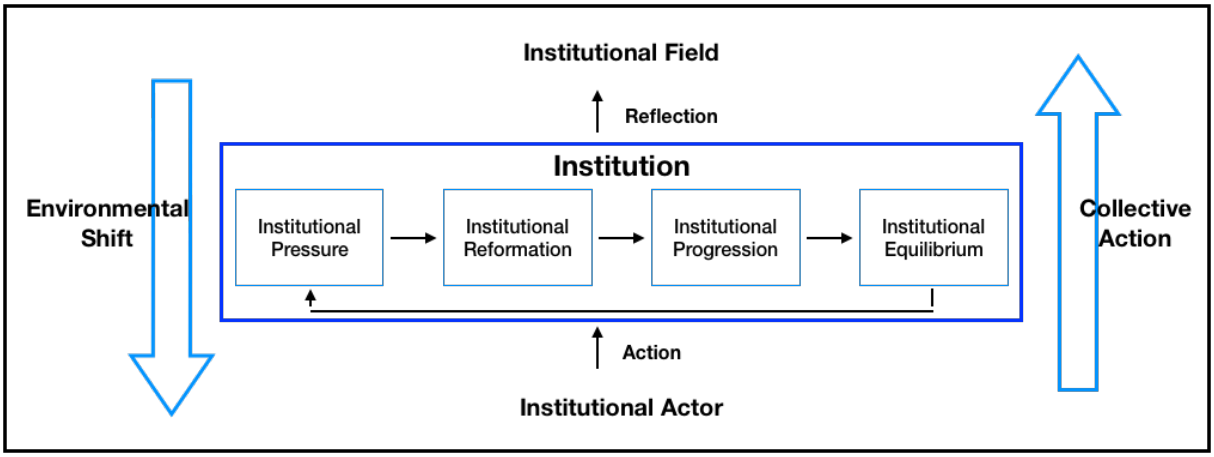

Figure 12-1 Institutional Progression Model

Source: The author's analysis

Our theoretical model begins with the fact that institutions are influenced by exogenous factors, such as political shifts, technology advancements and social movements, as well as endogenous factors, such as performance pressure, technology breakthrough and key actors shift. These factors trigger change desire and pressure at institutions and institutional field levels. In a nested institutional arrangement, the interaction between "exogenous" and "endogenous" factors can trigger political competition, and therefore, certain political systems become more prone to reform than others if certain conditions are present. **We refer to this stage as "Institutional Pressure" and apply the "Revolutionary Change Model" to explain the mechanism of how pressure arises to drive change, and how change barriers are managed.** Revolutionary model describes change as revolutionary and radical with the intention to create new arrangement and value network, which will eventually disrupt and replace the existing institutional arrangement. The revolutionary institutional pressure can be initiated at the institutional field or institution levels and drive down to the institutional actors to take actions to address the pressures.

Institution entrepreneurs take the change pressure opportunity to socialize their proposals, mobilize resources and call for actions to reform the institutions and institutional environments. Individual actors intend to create or change institutional arrangements to resolve conflicts and remove the change pressures. They try to set new rules of the game that enable and constrain actors by changing their reality boundaries and institutional power. At this stage, institutional entrepreneurship emerges and drives formation of "better" institutional arrangements. **We refer to this stage as "Institutional Reformation" and apply the "Dialectic Change Model" to explain how institutional entrepreneurs compete to resolve the puzzle and lead the reform.** Dialectical model sees change as a progressive outcome of confrontation and conflict resolution between opposing entities. Institutional design is initiated and acted by institutional entrepreneurship, and continues to drive the institution and institutional field levels to gain influences and attention.

When a form of institutional arrangement proven to succeed, institutional actors begin to conform or adapt to the new standard norms, beliefs, and rules in the institutional environment to replicate the success and gain legitimacy. Apart from adapting to the standards, the institutional actors also individually and collectively help improve the standards and reinvent the innovation to fit their local implementation setting. At this stage, institutions actively adopt

and continue improving the norms until they become legislations or industrial standards. At the institutional field level, the diffusion of the selected institutional form or practice within a population of organizations that are in the same institutional environment will happen. The diffusion occurs through regulative, normative, or cultural/cognitive processes of change and tend to generalize the new form of norms and retire the old one. **We refer to this stage as "Institutional Progression" (**a combination of "Institutional adaptation and diffusion) **and apply the "Teleology Change Model" to explain how institutions engage in activities to achieve a state to gain legitimacy and institutional isomorph.** Teleology model considers change as a flow of activities to achieve a targeted state based on the learning and vision of the entity or people involved. Institutional progression begins at institutions and progressively diffuse to the entire industry. Institutional actors are key players in the entire institutional progression process by determining the condition and mechanism for reproduction, the rate of change and degree of generalization.

Institutions and the entire industry will eventually reach a state of equilibrium where both formal and informal "rules", which govern the behavior and expectations of institutional actors, become well integrated and successfully formulate a unified framework to coordinate their activities to achieve a shared system of beliefs about the expected behavior of the members in the field in various contingencies. At this stage, in equilibrium, each agent is constrained both by the exogenous physical constraints in the underlying game, and by the endogenous institutional "rules of the game", which reflect the strategies of other players, and act collectively to maximize their overall welfare. **This stage is referred to as "Institutional Equilibrium" and the "Evolutionary Change Model" is applied to explain how exogenous and endogenous parameters shifts can lead to an "institutional disequilibrium" and become an impetus for institutional change.** Institutional actors perceive that the current arrangement is no longer optimal and start experimenting new strategies. Eventually, their strategies and mental models will become mutually consistent within a new equilibrium through a repetitive sequence of variation, selection, and retention events among entities in the industry. Institutional actors, individually or collectively, drive the "punctuated equilibrium process", in which gradual changes in quasi-parameters occasionally lead to "institutional pressure" when it becomes clear that existing patterns of behavior no longer constitute an equilibrium.

Collective action is believed to reflect institutions' collective change activities rather than being a model of change itself. Many artefacts and constructions in collective change theory, such as mobilizing structure, political opportunity, framing process, construction of network and enactment of institutional arrangement are inherited from other institutional change

processes such as institutional design, adoption and diffusion. But in collective forms and effects, they emphasize on the inter-organizational institutional change process. Collective action is, instead, viewed as a bounded rationality reflection in the institutional field level.

Based on the above study, institutional environment shifts (such as political competition, technology advancement and social movement) as exogenous factors to institutional change need to consider the overall impacts of environmental shifts to institutional field, institution and institution actor. Without a macro-perspective on institutional environmental originality and influence, it is impossible to decouple and recouple the complexity of the nested and multidimensional institutional system to analyze change in a meaningful way. Therefore, the author included environmental shift as a separate construct in our analysis model.

The author further concluded that institutional actors are key players to define, refine and redefine the rules of the game in an institution. Their actions, whether as institutional entrepreneurs or institutional actors, are key to study the institutional change factors and process – the why and what questions. Institutional change processes happen and are managed within institution(s), and therefore the study of institutions change shall be the focal point in institutional change understanding. We consider institutional field as a collective reflection of what is happening in the institutions and inter-institutions relationships.

Take the institutional arrangements changes in China's financial service industry from 2010 to 2020 as an example to explain the Institutional Progression Model. China's banking system experienced some major changes during this period, notably due to macro economy turbulence, financial regulatory liberalization and social economy advancement. The 2008 US sub-prime loan crisis led to widespread large financial institution collapses and global banking system disorder. The **Environmental Shift** lead to increase in scrutiny of financial risks and protection of financial consumers' and investors' rights and interests in China. In November 2013, the Government issued a directive to deepen China's banking system reform. The Directive covered a wide range of reform issues related to opening the financial sector to private and foreign banking, promoting FinTech innovation, increasing direct finance's prevalence, improving Renminbi exchanges, accelerating interest rate liberalization, implementing Renminbi capital account liberalization, deposit insurance schemes and market exit mechanisms. All these turned into **Institutional Pressure** that drive institutional rearrangement to address the new business environment challenges and requirements.

The revolutionary institutional pressure was initiated at the institutional field (driven predominantly by regulatory powers) and drove down to the institutional actors to take actions

to address the pressures. The liberalization of financial market created a new model of multi-players interoperating in the new branchless banking ecosystem. In July 2015, the New Guideline was released to encourage innovation in FinTech and lay out measures to ward off potential risks. The government also implemented a pilot program for private banks to solve financing difficulties for MSEs. MYbank, WeBank, Du Xiaoman and aiBank were established during this period to provide unsecured micro-loans to small businesses in rural areas over the Internet. Institution entrepreneurs (like Jack Ma of Alibaba) took the change pressure opportunity to socialize their proposals, mobilize resources and call for actions to reform China's banking system, marking a new age of "Internet Finance". Regulator and TMT (Telecommunication, Media and Technology) entrepreneur actors led the change in institutional arrangements to resolve capital allocation conflicts and remove the (traditional bank bureaucracy) change pressures. New rules of the game were established that enable and constrain actors by changing their reality boundaries and institutional power. At this stage, institutional entrepreneurship (from FinTech firms and Innovative banks) emerged and drove formation of "better" institutional arrangements, such as branchless banking. The **Institutional Reformation** showed how institutional entrepreneurs compete to resolve the puzzle and lead the reform.

Over time, institutional actors began to conform or adapt to the new standard norms, beliefs, and rules in the institutional environment to replicate the success and gain legitimacy. Apart from adapting to the standards, the institutional actors also individually and collectively helped improve the standards and reinvent the innovation to fit their local implementation setting. This process continued until they became legislations or industrial standards. At the institutional field level, the diffusion of the selected institutional form or practice within a population of organizations. The **Institutional Progression** (a combination of "Institutional adaptation and diffusion) explained how institutions engaged in activities to achieve a state to gain legitimacy and institutional isomorph, such as user-centric innovation and cross-industry open collaboration.

At a certain point of time, institutions and the entire industry eventually reached an equilibrium state where both formal and informal "rules" became well-integrated and a new operating framework was successfully formulated. At this stage, in equilibrium, each agent is constrained by both the exogenous physical constraints in the underlying game and the endogenous institutional "rules of the game". The **Institutional Equilibrium** can be distorted by exogenous and endogenous parameters shifts which can become an impetus for institutional change. Institutional actors perceived the current arrangement to became no longer optimal and

started to experiment with new strategies. For example, the financial scandals with P2P lending platform, the commonality of mobile payment and the popularity of online WMP distribution have created a momentum of "New Banking Model", where Technology firms own banking licenses and becoming an important partner to traditional banks in terms of supply of FinTech technology, individual profiles and transactional records for better marketing of banking products and touchpoints with middle-income consumers.

12.6 Academic Implications

This study contributes to the literature on financial innovation and institutional change.

Firstly, while the debate of whether regulation is a catalyst or a hindrance to financial innovation may continue, evidence has been found from the case studies that when the bank's business strategies aligns with and supports government policy, regulation will be a catalyst to innovation. On the contrary, when the bank's business strategies are against or contradict government policy, regulation will be a hindrance to innovation. This is **a new insight that can help reconcile the long-debated topic in the academic forum.**

Secondly, it is also found **that firm size, market share, business maturity and cost of innovation can be key considerations in determining the innovation focus and strategy of a firm.** Large and diversified traditional banks conduct more regular process innovations to drive business alignment and work process efficiency. Exploitation (rather than exploration) product development strategy is adopted to reduce costs of development, failure and correction. Small and medium size traditional banks conduct more radical and incremental product innovations to drive financial performance and market share expansion. Process innovation is embedded in the daily operation through lean organizational structure; and FinTech firms use customer data, transactional records, and real-time credit modeling to identify use cases and application scenarios for NPD. The low cost of product diffusion (via digital application) allows FinTech firms to explore new product concepts more effectively in a regulatory sandbox environment where the financial market impacts can be more controlled.

Furthermore, this study proposes **a new model to explain the institutional arrangement changes in the financial service industry using China's banking system reform in the past 20 years.** The theoretical model explained the apparently multidimensional, multilayered and nested institutional changes in China's banking system. The institutional progression model consists of two social movements and four institutional changes. We consider both

environmental shift and collective action to reflect technology innovation and social movements rather that a model of change itself. Taking a macro perspective on institutional environmental originality and influence, we can decouple and recouple the complexity of the nested and multidimensional institutional system to analyze the industrial filed changes in a meaningful way.

It can be further concluded that institutional actors are key players to define, refine and redefine the arrangement in institutions and the institutional field. Their actions, whether as institutional entrepreneurs or institutional actors, are key to studying the institutional change factors and process. This model includes four stages of institutional change, which are institutional pressure, reform, progress and equilibrium, and each of these changes is explained by a change model. Current institutional change literature mostly analyzes change as "single-shot" events, or, on the contrary, as slowly moving processes. The "Institutional Progression Model" considers the fact that change happens in bundles or in package deals, with multi dimensions of reform happening concurrently. The model considers institutional reforms to be intertwined, mutually dependent and can have very consequential effects on institutional actors, institutions and institutional fields. This is the new insight added to the existing institutional theory.

12.7 Managerial Implications

This study identifies a few interesting stories and **new insights that are specific to China's regulatory environment.** International or new players to China's banking system shall be aware of these settings to avoid similar pitfalls or reduce costs of failure while operating commercial banking business in China.

Firstly, **institutional actors operating in China shall more proactively or transparently share innovation ideas or novelties with regulators (to test the water) and actively align new or customized products to support government policy.** In return, they can cautiously request informal policy support from regulators for the launch of their new products or services. **Bankers shall continue to engage in and develop informal relationship with their peers and regulators to understand the regulatory policy change and direction. This will help them preempt surprises and early identify opportunities as part of the environmental scanning exercise.**

Secondly, **bankers in China develop their innovation learning and competency**

through strategic partnerships and project learning, while FinTech firms adopt a more radical approach of strategic business unit and horse racing program. The "horse racing club" is an innovation incubator and accelerator program designed to promote "breakthrough innovation". Once the innovation idea is accepted, the firm will provide all the necessary resources and funding to sponsor the fertilization of idea to actual products. The objectives of "horse racing" is to not only find new ideas, but also identify talents and new start-up opportunities. However, there are inherent issues with the "horse racing" as there might be risks of invention disorder, loss of time, bad use of resources and competencies. Local government's innovation incentives and tax rebates are key drivers for this kind of in-house incubator and accelerator program. **New players shall carefully consider their organizational culture and trajectory before adopting this kind of program. It can create more harm than good if it is not managed properly.**

In addition to contributions specific to China's settings, there are **other new insights from the case studies that are generalizable to other financial service systems and regulatory frameworks.**

Firstly, this study found that financial innovation follows a generic innovation process of idea generation, concept development, product building, and innovation diffusion. And most LCBs tend to follow a more formalized innovation process and procedure. While concept development is a critical step in financial innovation, most product concepts tend to mimic and build on existing products. Because of the lack of patent protection, most banks are not motivated to invest in product innovation. Instead, they believe that process innovation can create a more sustaining comparative advantage to banks. **Bankers shall consider maintaining a portfolio of mixed products, services, processes, and business model innovations. This can help stretch out the capital and resource investment over multiple programs, with varying impacts on the bank's capability and competency development over a period.**

Secondly, many banks do see the necessity of having a formal innovation strategy or having a dedicated innovation department. However, the relation between fixed structures and innovativeness is weak. No clear evidence indicates that formalized structures will lead to higher quality of innovation work products, notwithstanding that formalized structures can help reduce procedural and resources uncertainty, which in turn lower communication costs and time. The communication flows orientation (vertical or horizontal) depends on the direction of information sharing and co-development. Effective innovation evaluation and rewarding systems are essential to continued healthy development of innovation routines. **Practitioners shall consider the state of government, process and people innovation maturity in deciding**

whether a formal, semi-structured or agile innovation structure shall be in place. Vertical innovation orientation is normally associated with a formal structure, while horizontal innovation orientation operates more effectively in an agile development setup.

Thirdly, we also found that multidisciplinary project team is more effective when the project mandates, scope and charter are clear and accepted within the institution. The team outcome can be more accountable, acceptable and generalizable with better communication and coordination with stakeholders. A multidisciplinary project team can improve knowledge absorption and accumulation through effective co-work and knowledge transfer. There will be additional communication costs but the knowledge creation will pay off in the long run; and finally, functional diversity facilitates a more open innovation process with integration of knowledges from different functional disciplines, whereas functional similarity facilitates an in-depth innovation process where competence in a deep sense within a single or limited discipline enhance knowledge breakthroughs. **Based on these insights, practitioners are advised to use a multidisciplinary project team due to their numerous benefits. In addition, managerial implications from increased communication time and costs as well as potential conflicts in matrix reporting shall be considered in advance.**

Fourthly, engaging customers in the innovation process is easier said than done. Most banks still rely on in-house research department, external consultants, and customer relationship managers to collect customer feedback for innovation. Customers do not have actual interest or want to participate in the financial innovation process, as they may lack the technical skills to assess and articulate their needs. Thanks to advancement in ICT technology, use of big data analysis can improve the product conceptual design and end-user usability for targeted customer groups/segments based on identified customer attributes and transaction variables**. As most financial consumers are moving from offline to online, banks shall revisit their branch network neighborhood strategy, and consider users' early participation in financial innovation process through regulatory sandbox simulation and pilot product user experience collection.**

12.8 Limitations

The case studies focus on traditional commercial banking in China, therefore the generalizability of the findings to other financial service sectors (such as insurance, trust, asset management and securitization) and other regulatory environments might be limited. Besides,

a sufficient number of cases has to be evaluated in terms of the research questions and with regard to existing knowledge. Even with six cases, it is often difficult to generate theory with much complexity, and its empirical grounding is likely to be unconvincing, unless the case has several mini-cases within it. Moreover, data collection was principally based on participants, although triangulation was undertaken wherever possible by taping interviews, using two complementary methods for data collection, consulting internal documents and secondary data, and observing the innovations in practice.

Another limitation of this study is the retrospective nature of its data collection. Data were collected from the key participants through interviews and workshop discussions at a single point in time, and sometime after the introduction of the new product. Such a procedure raises the possibility of insufficient or inaccurate information due to perceptual biases stemming from the performance of new product at the time of data collection. In addition, the interviewees were free to choose the most recent projects they reported on. Therefore, many of them might have chosen to report about their very successful projects. Thus, despite the care taken, there is a likelihood of self-selection bias.

12.9 Suggestions for Future Research

Future research could enlarge the unit sampling to include a variety of financial institutions such as merchant, rural cooperation and policy banks in different regulatory environments or countries. New forms of financial services, including cryptocurrency, shadow banking, P2P lending, third-party payment platform, online financial market and asset securitization, can be considered in future research too. Finally, the unit of analysis shall consider different forms of innovation in banking, and where possible, the institutional progression model shall be tested and validated by more case studies in further research.

Appendix 1: Interview Guide

Below is a description of the interview guide used during the empirical inquiry. The interview guide is a collection of questions investigating a variety of perspectives relating to innovation and compliance. Since each participant and situation required adaptation depending on the themes that emerged during the interview process and topics relevant to the participant, the interview guide represents an approximate description. For example, follow-up questions directed to senior project leaders differ from those directed to new hires, while questions to the top management also emphasize such aspects as firm strategies, market positioning, resources, social capital and overall visions and goals of the financial innovation process. Hence, the interviews reflect variety and individuality.

Introduction

An introduction to the study and presentation of the researcher.

Confidentiality and the use of information and empirical materials.

The recorder and the return of interview transcripts for comments and corrections.

Warm-up and Personal background

Please describe yourself and your department.

Innovation and Change

- In response to the changes in the market landscape, what have been the main changes in products, services and organization structure in your firm over the past four to five years? What factors resulted in these changes and innovations?
- Can you describe a few financial innovation projects of the firm in over the past four to five years? What was your involvement in these projects? Can you select an interesting innovation project and describe the process, from idea initiation to the launch of the new product?
- In almost all cases, the implementation of the change does not go as planned. In your case, were there surprises? Did you need to make adjustments during implementation to solve

problems and seize opportunities?

- Do all the innovation activities follow through the same process? What are the critical success factors? How were their values assessed and what was the rollout mechanism?
- Can you describe a less successful innovation project? In your opinion, why did it fail? What were the innovation and change barriers? What would you do differently to make it successful?
- What other changes are interesting or needed for the future? What kind of support do you expect from the organization and regulation to drive further innovation?

Regulatory influences on the innovation process

- What have been the various changes of regulation over the past four or five years? How did the firm respond to these changes?
- How were you informed of the regulatory changes? How did these regulatory changes affect your innovation and change process?
- What are the firm's innovation and change strategies in a regulated and constrained environment?
- How did your firm make use of these opportunities to adjust/innovate to enhance its competitive advantage?
- How would you like to describe the regulatory environment in China? What are the differences compared to more mature financial regulatory frameworks?
- How do you/does the firm refer to innovation practices/experience in more mature financial markets?
- In your opinion, how should responsible financial innovation be promoted in the Chinese regulatory environment? What are the conditions for Chinese financial innovation to succeed?
- How did the firm reconcile the dialectics between innovation and regulation?

Innovation management

- How do you manage the innovation process of your firm? Please provide descriptions and examples of organizational structure, people, process and technology used.

- How do you maintain this innovation framework? What does the firm need to do more to develop or maintain the innovation competency?
- At work, how does collaboration with others (inside and outside of the firm) take place in the financial innovation process?
- What will be the most important challenges in terms of innovation management and competence development for you and for the firm as a whole in the future?

Additional comments

- Is there anything you would like to refine or add to help me understand the innovation process and innovation competence development in your firm? What did I forget to ask?
- Are these questions of relevance to you? Could you suggest any other people or firms that I may contact?

Close the interview. Repeat the returning of the interview transcript, and how this will be followed up.

Thank you!

Appendix 2: An Overview of Participants

Case firm	HQ	BRC	MGRs	OFFs	INNO	SALES	REG	OTH
Industrial Bank (pilot study)	2	0	2	0	0	0	1	1
HSBC	5	0	4	1	1	2	2	0
CCB	1	4	4	1	2	2	1	0
Ping An	2	4	3	3	1	1	1	3
MYbank	2	2	2	2	1	1	1	1
WeBank	4	4	4	4	3	2	1	2
Du Xiaoman / aiBank	6	5	5	6	4	2	3	2
Industry experts	6	0	6	0	3	0	3	0
Total	28	19	30	17	15	10	13	9

Note 1: For functional definition

- Headquarters (HQ): Participants from the Headquarter bank, or the Headquarter's senior management
- Branch (BRC): Participants from provincial and city-level banks, or middle management from regional or country-level branches
- Managers (MGRs): Participants who are senior executives and managers, such as branch, division, product and project managers who have managerial responsibilities
- Officers (OFFs): Participants who are middle management officers responsible for day-to-day banking activities
- Innovation (INNO): Participants from product and process innovation related functions
- Sales (SALES): Participants from customer relationship, sales and customer service functions
- Regulation (REG): Participants from risk, legal, compliance, treasury, finance, control and governance related functions
- Other (OTH): Participants from other operational functions

Appendix 3: Data Collection Details

Participants	Data Collection Method	Data Collection Duration	Data Collection Period	Data Validation Period
INDUSTRIAL BANK:				
Legal Director (Trust Unit)	In-person interview	75 mins	Jul. 2017	Oct. 2017
Operation Director (Trust Unit)	In-person interview	90 mins	Jul. 2017	Nov. 2017
HSBC:				
Product Management Director	In-person interview	90 mins	Mar. 2018	Jun. 2018
Sales and Marketing VP	In-person interview	45 mins	Mar. 2018	Jul. 2018
Business Risk & Control Management Director	Group interview	60 mins	Apr. 2018	Jul. 2018
Customer Relationship VP	Phone interview	20 mins	Apr. 2018	Jun. 2018
Risk Management Manager	Group interview	60 mins	Mar. 2018	Jun. 2018
CCB:				
Product Development Director	Workshop discussion	90 mins	Jul. 2018	Sep. 2018
Sales and Marketing Div VP	Workshop discussion	90 mins	Jul. 2018	Sep. 2018
Innovation Management VP	Workshop discussion	90 mins	Jul. 2018	Sep. 2018
Customer Relationship Manager	Workshop discussion	90 mins	Jul. 2018	Sep. 2018
Risk Management Director	Workshop discussion	90 mins	Jul. 2018	Sep. 2018
Ping An Bank:				
Deputy CEO	Group I interview	60 mins	Jan. 2019	Mar. 2019
Division Manager	Group I interview	60 mins	Jan. 2019	Mar. 2019
Product Development Director	Group II interview	90 mins	Jan. 2019	Mar. 2019
Innovation Management Director	Group II interview	90 mins	Jan. 2019	Mar. 2019

Risk Management Manager	In-person interview	30 mins	Jan. 2019	Apr. 2019
Sales and Marketing Manager	Phone interview	30 mins	Jan. 2019	Apr. 2019
MYbank:				
Bank Manager	In-person interview	60 mins	Apr. 2019	Jul. 2019
Deputy Bank Manager	In-person interview	30 mins	Apr. 2019	Jun. 2019
Senior Product Manager	In-person interview	90 mins	Apr. 2019	Jun. 2019
Legal and Compliance Manager	In-person interview	60 mins	Apr. 2019	Jun. 2019
WeBank:				
Head of Regional Fintech Partnerships	In-person interview	60 mins	Sep. 2019	Dec. 2019
Senior Technology Manager of Collaborative Business	Group interview	90 mins	Sep. 2019	Dec. 2019
Senior Researcher of AI Department	Group interview	90 mins	Sep. 2019	Dec. 2019
Chief Architect of WeBank Open Platform	Group interview	90 mins	Sep. 2019	Dec. 2019
Product Manager of WeBank Open Platform	Group interview	90 mins	Sep. 2019	Dec. 2019
Senior Blockchain Architect	In-person interview	30 mins	Sep. 2019	Dec. 2019
Big Data Engineer	In-person interview	20 mins	Sep. 2019	Dec. 2019
Legal and Compliance Manager	In-person interview	30 mins	Sep. 2019	Dec. 2019
CITIC aiBank:				
Bank Manager	In-person interview	30 mins	Aug. 2019	Jan. 2020
Deputy Bank Manager	In-person interview	30 mins	Aug. 2019	Jan. 2020
Senior Product Manager	Group interview	90 mins	Aug. 2019	Jan. 2020
Legal and Compliance Manager	Group interview	90 mins	Aug. 2019	Jan. 2020
Du Xiaoman:				

Former CEO	In-person interview	30 mins	Oct. 2019	Feb. 2020
Former Operation Director	In-person interview	30 mins	Sep. 2019	Feb. 2020
Consumer Finance VP	Group interview	90 mins	Nov. 2019	Feb. 2020
Product Manager	Group interview	90 mins	Nov. 2019	Feb. 2020
Risk Control Manager	In-person interview	30 mins	Nov. 2019	Feb. 2020
Chief Product Architect	In-person interview	20 mins	Nov. 2019	Feb. 2020
BAIDU:				
International Communication Director	WeChat interview	15 mins	Dec. 2019	Feb. 2020

Bibliography

Abir, M. and Chokri, M. (2010) Dynamic of financial innovation and performance of banking firms: context of an emerging banking industry, *International Research Journal of Finance and Economics*, 51, 17-37.

Achhorner, T., Chng, J., Michaelis, H. and Tang, T. (2006), *Banking on China Successful Strategies for Foreign Entrants*, The Boston Consulting Group, Boston, MA.

Acs Z. J., Anselin L., Varga A. (2002). Patents and innovation counts as measures of regional production of new knowledge. *Research Policy*, 31 (7), 1069-1085.

Akamavi, R.K. (2005) Re-engineering service quality process mapping: E-banking processes', *International Journal of Bank Marketing*, 23 (1), 28-53.

Akamavi, R.K., Charrington, S., Gledhill, C. and Cowie, S. (2001) 'Process mapping – re-engineering the opening student account: The case of Lloyds TSB Bank. *Journal of Financial Services Marketing*, 5 (3), 246-262.

Akhavein, J., Frame, W.S. and White, L.J. (2005). The diffusion of financial innovations: an examination of the adoption of small business credit scoring by large banking organizations. *The Journal of Business*, 78 (2), 577-596.

Alam I. (2003). Innovation strategy, process and performance in the commercial banking industry. *Journal of Marketing Management,* 19, 973-999.

Aldrich, H. E. (1999). *Organizations Evolving*. London: Prentice-Hall.

Allen F., Qian J., Qian M.J. (2007). *China's Financial System: Past, Present, and Future, in China's Great Economic Transformation*, edited by Thomas G. Rawski and Loren Brandt. Cambridge University Press. ISBN 0-521-88557-4.

Alt R. and Puschmann T. (2012) The rise of customer-oriented banking: Electronic markets are paving the way for change in the financial industry. *Electron Markets*, 22, 203-215.

AM. J (2008). From the editors: Beyond contextualization: Using context theories to narrow the micro-macro gap in management research. *Academy of Management Journal*, 51 (5), 839-846.

Anderloni, L. and Bongini, P. (2009). Is financial innovation still a relevant issue?' in Anderloni,L., Llewellyn, D.T. and Schmidt, R.H. (Eds.): *Financial Innovation in Retail and Corporate Banking*, 41-62, Edward Elgar, Cheltenham.

Armstrong, M., G. Cornut, S. Delacˆote, M. Lenglet, Y. Millo, F. Muniesa, A. Pointier and Y. Tadjeddine (2012), Towards a practical approach to responsible innovation in finance: New Product Committees revisited. *Journal of Financial Regulation and Compliance*, 20 (2), 147-168.

Athanassopoulou, P. and Johne, A. (2004). Effective communication with lead customers in developing new banking products. *International Journal of Bank Marketing*, 22 (2), 100-125.

Avlonitis, G. J., Papastathopoulou, P. G. and Gounaris, S. P. (2001). An empirically based typology of product innovativeness for new financial services: Success and failure scenarios. *Journal of Product Innovation Management*, 18 (5), 324-342.

Azis, Y. and Osada, H. (2011). An empirical study of new value creation in financial service companies using design for Six Sigma approach. *International Journal of Productivity and Quality Management*, 7 (1), 104-124.

B. Düring (2006). "Sprint driven development: Agile methodologies in a distributed open source project (PyPy)" in *Extreme Programming and Agile Processes in Software Engineering*, P. Abrahamsson, M. Marchesi, and G. Succi, Eds. Springer Berlin Heidelberg, 191-195.

Bahrami, H. & Evans, S. (1988). "Stratocracy in High Technology Firms." *California Management Review,* 30(1), 51-66, Winter 1987, reprinted in G. Carroll & D. Vogel (Eds.) (1988): Organizational Approaches to Strategy. Cambridge, MA: Ballinger.

Barley, S. R. & Tolbert, P. S. (1997). Institutionalization and structuration: Studying the links between action and institution. *Organization Science,* 18, 93-117.

Barth, J. R., Caprio, G. Jr and Levine, R. (2006). *Rethinking Bank Regulation*. Cambridge: Cambridge University Press.

Batiz-Lazo, B. and Woldesenbet, K. (2006). The dynamics of product and process innovation in UK banking. *International Journal of Financial Services Management*, 1 (4), 400-421.

Battilana J, Leca B, Boxenbaum E. (2009) How actors change institutions: towards a theory of institutional entrepreneurship. *Acad Manage Ann*. 2009;3(1):65–107.

Battilana J. (2006) Agency and institutions: the enabling role of individuals' social position. *Organization.* 2006;13(5):653–76.

Battilana, J. & Casciaro, T. (2012). "Change agents, networks, and institutions: A contingency theory of organizational change." *Academy of Management Journal*, 55(2): 381-398.

Battilana, J., & Dorado, S. (2007). *The secret of commercial microfinance's sustainability: Turning social workers into bankers or bankers into social workers? Neither.* Paper presented at the European Group of Organizational Scholars (EGOS), EGOS Series, Vienna, July.

Battilana, J., Leca, B., & Boxenbaum, E. 2009. How actors change institutions: Towards a theory of institutional entrepreneurship. In J. P. Walsh & A. P. Brief (Eds.), *Academy of Management annals***,** vol. 3: 65–107. Essex, U.K.: Routledge.

Beck, Kent (1999). "Embracing Change with Extreme Programming". *Computer 32 (10): 70–77.*

Beck, Kent; et al. (2001). "*Manifesto for Agile Software Development".* Agile Alliance. Gartner (2019) Hype Cycle for Open Banking, 2019, Gartner Research Publication. ID: G00407495. Published: 04 October 2019.

Becker, Gary. (1976). "The Economic Approach to Human Behavior," in *The Economic Approach to Human Behavior* (Chicago and London: The University of Chicago Press),

pp. 3-14.

Bell, S.K. and Chao, H. (2010), *The financial system in China: risks and opportunities following the global financial crisis*, White Paper.

Benford, R. D. & Snow, D. A. (2000). Framing processes and social movements: an overview and assessment. *Annual Review of Sociology*, 26, 611–639.

Blackburn, S. (1994). *The Oxford dictionary of philosophy.* Oxford, UK: Oxford University Press.

Blazevica and Lievensb (2004) Learning during the new financial service innovation process: antecedents and performance effects. *Journal of Business Research* 57 (2004) 374– 391.

Block, Z. and MacMillan, I.C. (1993) *Corporate Venturing. Creating New Business within the Firm*. Harvard Business School Press, Boston, MA.

Bofondi, M. and Lotti, F. (2006) 'Innovation in the retail banking industry: the diffusion of credit scoring', *Review of Industrial Organization*, Vol. 28, No. 4, pp.343–358.

Bourdieu, P. (1977). *Outline of a theory of practice.* Cambridge, UK: Cambridge University Press.

Bourgeois, L. J. (1985). Strategic goals, perceived uncertainty and economic performance in volatile environments. *Academy of Management Journal*, 28(3), 548-573.

Brandt, L. et al. (2008), *China's Great Transformation*, Cambridge University Press.

Burawoy, M. (1998), The Extended Case Method. *Sociological Theory*, 16: 4–33. doi: 10.1111/0735-2751.00040.

Burgelman, R.A., & Grove, A.W. (2007). Let chaos reign, then rein in chaos – repeatedly: managing strategic dynamics for corporate longevity. *Strategic Management Journal*, *28*, 965-979.

Callon, M. & Latour, B. 1981. *Unscrewing the big Leviathan: how actors macro-structure reality and how sociologists help them to do so.* In Knorr-Cetina & Cicourel (eds.) Toward an integration of micro- and macrososiologies. London: Routledge & Kegan, 277-303.

Campbell, J. L. 2004. *Institutional Change and Globalization*, Princeton, NJ: Princeton University Press.

Carroll GR, Hannan MT.（2000）Why corporate demography matters: policy implication of organizational diversity. *Calif Manage Rev* 2000;42:148–63 (Spring).

Carvalho Veira, J.M., de Magalhaes Serra, E. and Gonzalez, J.A.V. (2004) 'New services margin/high success discriminators', *The Service Industries Journal*, Vol. 24, No. 5, pp.91–101.

Casu B., Girardone C. and Molyneux P. (2006) *Introduction to banking*. Edinburgh, Harlow, Essex: Pearson Education Limited

CBRC (2007a), *Annual Report 2006*, China Banking Regulatory Commission, Beijing

CBRC (2009), *Annual Report 2008*, China Banking Regulatory Commission, Beijing.

CBRC (2010), *Annual Report 2009*, China Banking Regulatory Commission, Beijing.

CBRC (2014). *Annual Report 2013*, China Banking Regulatory Commission, Beijing

Cheng Maoyong, Zhao Hong and Zhang Junrui (2005) The Effects Of Ownership Structure And Listed Status On Bank Risk In China. *The Journal of Applied Business Research* - May/June 2013 Volume 29, Number 3.

Cheng MY, Zhao H and Zhang JR (2013). The effects of Ownership structure and listed status on bank risk in China. *The Journal of Applied Business Research.* Volume 29, Number 3. May/June 2013.

Chesbrough H. (2006), *"Open Innovation: A New Paradigm for Understanding Industrial Innovation,*" in Open Innovation: Researching a New Paradigm, ed. H. Chesbrough, W. Vanhaverbeke, and J. West (Oxford: Oxford University Press, 2006), pp. 1-12.

Chinese Business News (2013), "*China Internet Financial Forum & Press Conference for the China's P2P Lending Services Industry* White Paper 2013," presented in an event sponsored by the Chinese Business News and the CBN Center for New Finance Research jointly with CreditEase.

Ciciretti, R., Hasan, I. and Zazzara, C. (2009) 'Do internet activities add value? Evidence from the traditional banks', *Journal of Financial Services Research*, Vol. 35, No. 1, pp.81–98.

Commons, J. R. (1950). *The economics of collective action.* Madison, WI: University of Wisconsin Press.

Costanzo L.A. and Ashton J.K. (2006) Product innovation and consumer choice in the UK financial services industry, *Journal of Financial Regulation and Compliance.* Vol. 14 No. 3, 2006 pp. 285-303.

Credit-suisse (2014). *China Market Strategy. Why Internet finance?* Credit-suisse Asian Daily, 06 January 2014.

Damanpour, F. (1992) 'Organizational size and innovation', *Organization Studies*, Vol. 13, No. 3, pp.375–402.

Damanpour, F. and Gopalakrishnan, S. (2001) 'The dynamics of the adoption of product and process innovations in organizations', *Journal of Management Studies*, Vol. 38, No. 1, pp.45–65.

de Brentani, U. and Cooper, R. (1992) 'Developing successful new financial services for businesses', *Industrial Marketing Management*, Vol. 21, No. 3, pp.231–241.

De Koning, H., Does, R.J.M.M. and Bisgaard, S. (2008) 'Lean Six Sigma in financial services', *International Journal of Six Sigma and Competitive Advantage*, Vol. 4, No. 1, pp.1–17.

Deephouse, D. L. (1996). Does isomorphism legitimate? *Academy of Management Journal*, 39, 1024–1039.

Déjean, F., Gond, J.P., & Leca, B. (2004). Measuring the unmeasured: An institutional entrepreneur's strategy in an emerging industry. *Human Relations, 57*(6), 741–764.

Den Haan, W.J. and Sterk, V. (2010) 'The myth of financial innovation and the great

moderation', *The Economic Journal*, June, Vol. 121, No. 553, pp.707–739.

DeYoung, R., Lang, W.W. and Nolle, D.L. (2007) 'How the internet affects output and performance at community banks', *Journal of Banking & Finance*, Vol. 31, No. 4,pp.1033–1060.

DiMaggio PJ (1988). Interest and agency in institutional theory. In: Zucker LG, editor. Institutional patterns and organizations. *Cambridge, MA: Ballinger; 1988. p. 3–22*.

DiMaggio, P. J. & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review,* 48, 147–160.

Dorado, S. (2005). Institutional entrepreneurship, partaking, and convening. *Organization Studies, 26*(3), 383–413.

Drew, S.A.W. (1995) 'Accelerating innovation in financial services', *Long Range Planning*, Vol. 28, No. 4, pp.1–10.

Economist (2014*). The right call*. The Economist On-line. Nov 21st2014. Accessed on 31 Nov 2014.

Eichengreen B. and Kawai M.(2014). *Issues for Renminbi Internationalization: An Overview*. ADBI Working Paper Series No. 454. January 2014. Asian Development Bank Institute.

Eisenhardt K.M. (1989). Building Theories from Case Study Research. *Academy of Management Review,* 1989, Vol. 14. No. 4, 532-550.

EY (2013), *Future directions for foreign banks in China*, EY publication.

EY (2013a) *Financial supervision reform will influence business model in banking.* EY China.

Fabian Muniesa and Marc Lenglet (2013), "Responsible innovation in finance: directions and implications", in Richard Owen, John Bessant, Maggy Heintz (eds.), *Responsible Innovation: Managing the Responsible Emergence of Science and Innovation in Society*, Chichester, Wiley: 185-198.

Faz, Xavier, and Mozer T. (2013). *"Advancing Financial Inclusion through Use of Market Archetypes.*" Focus Note 86. Washington, D.C.: CGAP, April.

Fligstein, N. (1996). Markets as politics: A political cultural approach to market institutions. *American Sociological Review,* 61, 228–244.

Fligstein, N. (2001). Social skill and the theory of fields. *Sociological Theory, 19*(2), 105–125.

Fox-Wolfgramm S. J., Boal K.B. and Hunt J. G. (Jerry) (1998). Organizational Adaptation to Institutional Change: A Comparative Study of First-Order Change in Prospector and Defender Banks. *Administrative Science Quarterly* Vol. 43, No. 1 (Mar., 1998), 87-126.

Frame, W.S. and White, L.J. (2004) 'Empirical studies of financial innovation: lots of talk, little action?', *Journal of Economic Literature*, Vol. 42, No. 1, pp.116–144.

FSA (2006), *Financial Capability in the UK: Establishing a Baseline*, The Financial Services Authority, London.

Fu X. and Heffernan S. (2005) '*China: The Effects of Bank Reform on Structure and Performance'*, Cass Business School Faculty of Finance, Working Paper No. WP-FF-19-2005.

Funke M.L., Li X. and Lochel H. (2016) The High Profitability of Big Chinese State-Owned Banks and China's Growth Model, *Homo Oecon* (2016) 33:121–134.

Gagnon J. E. and Troutman K. (2014). *Internationalization of the Renminbi: The Role of Trade Settlement.* Peterson Institute for International Economics. No. PB14-15, May 2014.

Galaskiewicz, J., & Wasserman, S. (1989). Mimetic processes within an inter-organizational field: An empirical test. *Administrative Science Quarterly*, *34*, 454-479.

Gao J. (2012), *China's Bank Reform and the Roles of Sovereign Wealth Fund*, Edited by Detlev Hummel, The Euro Financial crisis, Impacts on Banking, Capital Markets, and Regulation. Report of the International Workshop in Potsdam on July 20/21,2012. Pg 73-84. Universitatsverlag Potsdam, ISBN 978-3-86956-252-0.

Gao J. and Fotak V. (2010), *Chinese Bank Reform and Privatization: A Long Way to Go*, Edited by Privatization Barometer in The PB Report 2010, Privatization Barometer, www.privatizationbarometer.net/newsletter.

Garcia-Herrero, A., Gavila, S. and Santabarbara, D. (2007), *What explains the low profitability of Chinese banks*, Working Paper No. 30, The American University of Paris, Paris.

Garud, R., Jain, S., & Kumaraswamy, A. (2002). Institutional entrepreneurship in the sponsorship of common technological standards: The case of Sun Microsystems and Java. *Academy of Management Journal, 45*(1), 196–214.

Geiger, M. (2008), *Instruments of monetary policy in China and their effectiveness: 1994-2006,* paper presented at the United Nations Conference on Trade and Development, Geneva.

Gennaioli N, Shleifer A, Vishny R. (2010) *Financial Innovation and Financial Fragility.* Working paper no. 16068, National Bureau of Economic Research.

Glaser, B.G. and Strauss, A.L. 1967. *The Discovery of Grounded Theory.* Chicago: Aldine Publ. Co.

Goddard, J., Molyneux, P., Wilson, J.O.S. and Tavakoli, M. (2007) 'European banking: an overview', *Journal of Banking & Finance*, Vol. 31, No. 7, pp.1911–1935.

Goetzmann W, and Rouwenhorst G, ed. (2005) *The Origins of Value: The Financial Innovations that Created Modern Capital Markets*. New York: Oxford University Press.

Goulding, C. (2005) Grounded theory, ethnography and phenomenology: a comparative analysis of three qualitative strategies for marketing research. *Eur. J. Mark.* 39(3/4), 294–308.

Greenwood, R., Suddaby, R., & Hinings, C. R. (2002). Theorizing change: The role of professional associations in the transformation of institutionalized fields. *The Academy of Management Journal,* 45, 58–80.

Greiner, L. E. (1972). Evolution and revolution as organizations grow. *Harvard Business Review,* 50, 37–46.

Guo P. and Jia X.P. (2008). "*The Structure and Reform of Rural Finance in China*." Working Papers in Economics & Management (Working Paper 2008E002), China Agricultural University, October 2008.

Han, Q. (2007), New regulatory developments in China's derivatives markets, *China Law & Practice*, Vol. 34, February.

Hannan, M. T. & Freeman, J. (1977). The population ecology of organizations. *American Journal of Sociology,* 82, 929–964.

He W.P. (2012) Banking regulation in China: what, why, and how? *Journal of Financial Regulation and Compliance*. Vol. 20 No. 4, pp. 367-384.

Hernando, I. and Nieto, M.J. (2007) 'Is the internet delivery channel changing banks' performance? The case of Spanish banks', *Journal of Banking and Finance*, Vol. 31, No. 4, pp.1083–1099.

Herriott, R. E., & Firestone, W. A. (1983). Multi-site qualitative policy research: Optimizing description and generalizability. *Educational Researcher*, 12, 14-19.

Hinings C.R., Greenwood R., Reay T. & Suddaby R. (2004) *Dynamics of Change in Organizational Fields.* In Poole, M. S. and Van de Ven, A. H. (eds.) (2004). Handbook of Organizational Change and Innovation. (pp.304-323). New York: Oxford University Press.

Hoffman, A. J. (1997*). From heresy to dogma: An institutional history of corporate environmentalism*. San Francisco, CA: The New Lexington.

Hogan Lovells (2014). *Third Party Payment Licences in China - Are They within The Grasp of Foreign Investors?* Hogan Lovells Publication June 2014.

Hurwicz, L. (1987). Inventing new institutions: The design perspective. *American Journal of Agricultural Economics*, 69, 395–402.

Isik, I., & Hassan, M. K. (2003). Financial Deregulation and Total Factor Productivity Change: An Empirical Study of Turkish Commercial Banks. *Journal of Banking & Finance*, 27, 1455-1485.

Jiang C. and Yao S. (2017). Chinese Banking Reform, *The Nottingham China Policy Institute Series*, DOI 10.1007/978-3-319-63925-3_2.

John, G. & T. Reve (1982) "The Reliability and Validity of Key Participant Data from Dyadic Relationships in Marketing Channels" *Journal of Marketing Research* v19 January 1982 p517-524.

Johne, F.A. and Davies, R. (2000) 'Innovation in medium-sized insurance companies: how marketing adds value', *International Journal of Bank Marketing*, Vol. 18, No. 1, pp.6–14.

Johnson, R.B. (1997). Examining the Validity Structure of Qualitative Research. *Education,* 118: 282-292.

Kane E.J.(1977) Good Intentions and Unintended Evil: The Case against Selective Credit Allocation. *Journal of Money, Credit and Banking*. Vol. 9. 55-69.

Kang, L.M. (2010), *CBRC Feedback on the BCBS Documents,* China Banking Regulatory

Commission, Beijing.

Kim,J.S., and Arnold, P., (1996). Operationalizing manufacturing strategy: an exploratory study of constructs and linkage. *International Journal Operation Production Management.* 16. 45-73.

Koene, B.A.S. (2006). Situated human agency, institutional entrepreneurship, and institutional change. *Journal of Organizational Change, 19*(3), 365–382.

KPMG (2007), *Retail Banking in China: New Frontiers,* KPMG and Reuters, New York, NY.

Kraatz, M. S. & Zajac, E. J. (1996). Exploring the limits of the new institutionalism: The causes and consequences of illegitimate organizational change. *American Sociological Review,* 61, 812–836.

Krugman P. (2007) Innovating Our Way to Financial Crisis. *New York Times*, December 3.

Kumar, S., Wolfe, A.D. and Wolfe, K. (2008) 'Using Six Sigma DMAIC to improve credit initiation process in a financial services operation', *International Journal of Productivity and Performance Management*, Vol. 56, No. 8, pp.659–676.

Laeven L., Ratnovski L., and Tong H. (2014). *Bank Size and Systemic Risk.* IMF Staff Discussion Note. May 2014. SDN/04/14.

Landau, M.: 1969, 'Redundancy, Rationality, and the Problem of Duplication and Overlap', *Public Administration Review* 29, 346–58.

Lawrence, T.B. (1999). Institutional strategy. *Journal of Management, 25*(2), 161–188.

Leblebici, H., Salancik, G.R., Copay, A., & King, T. (1991). Institutional change and the transformation of inter-organizational fields: An organizational history of the US radio broadcasting industry. *Administrative Science Quarterly, 36*(3), 333–363.

Lee, K. & Pennings, J. M. (2002). Mimicry and the market: Adoption of a new organizational form. *Academy of Management Journal,* 45(1), 144–162.

Lerner J. (2006) The New Financial Thing: The Origins of Financial Innovations. *Journal of Financial Economics*, 79: 233-55.

Lerner J. and Tufano P. (2011) *The Consequences Of Financial Innovation A Counterfactual Research Agenda*, Working Paper 16780, National Bureau of Economic Research.

Lerner, J. (2006) 'The new new financial thing: the origins of financial innovations', *Journal of Financial Economics*, Vol. 79, No. 2, pp.223–255.

Li Yuhua (2013) Motivation of Foreign Strategic Investment in China's Banking sector: The Eclectic Paradigm. *The Journal of International Management Studies*, Volume 8 Number 1, April, 2013.

Lievens, A. and Moenaert, R. (2000) 'Project team communication in financial service innovation', *Journal of Management Studies*, Vol. 37, No. 5, pp.733–766.

Lin, J. (2008) 'The unrealized potential of Six Sigma in finance', *Proceedings of ASBBS*, Vol. 15, No. 1, pp.472–478.

Lindblom, C. E. (1965). *The intelligence of democracy: Decision making through mutual adjustment.* New York: Free Press.

Lindquist, K. & Mauriel, J. (2001). Depth and breadth in innovation implementation: The case of schoolbased management. In A. H. Van de Ven, H. L. Angle, & M. S. Poole (Eds.), *Research on the management of innovation: The Minnesota studies* (pp. 561–582). New York: Oxford University Press.

Lopez, L.E. and Roberts, E.B. (2002) 'First-mover advantages in regimes of weak appropriability: the case of financial services innovations', *Journal of Business Research*, Vol. 55, No. 12, pp.997–1005.

Lounsbury, M. (2002). Institutional transformation and status mobility: The professionalization of the field of finance. *Academy of Management Journal*, 45, 255–266.

Lu Q. (2008). *Government Control, Transaction Costs, and Commitment Between the Hongkong and Shanghai Banking Corporation (HSBC) and the Chinese Government*. Published by Oxford University Press on behalf of the Business History Conference.

Lu, M.T, et al. (2005). Internet banking: strategic response to the accession of WTO by Chinese banks. *Industrial Management & Data Systems*, 2005. 105(4): p. 429-440.

Ma J.T. and Sun J. (2009) The Research of Promoting the Chinese Banking Industry Core Competitiveness under the Financial Globalization Background. *International Journal of Economics and Finance.* Vol. 1, No. 2.

Maguire, S., Hardy, C., & Lawrence, T.B. (2004). Institutional entrepreneurship in emerging fields: HIV/AIDS treatment advocacy in Canada. *Academy of Management Journal, 47*(5), 657–679.

Markowitz, L. (2007). Structural innovators and core-framing tasks: How socially responsible mutual fund companies build identity among investors. *Sociological Perspectives, 50*(1), 131–153.

Martin M.F. (2012). *China's Banking System: Issues for Congress*. CRS Report for Congress, February 20, 2012.

Martovoy, A. (2014). *Advantages and Disadvantages of Open Innovation: Evidence from Finance Services*. in Mention A.L and Torkkeli M (eds) (2014) Innovation in Financial Services: A Dual Ambiguity. (pp.259-294) Cambridge Scholar Publishing.

Martovoy, A., & Dos Santos, J. (2012). Co-creation and co-profiting in financial services. *International Journal of Entrepreneurship and Innovation Management*, *16*(1-2), 114-135.

Mason J. R. (2008) The Summer of '07 and the Shortcomings of Financial Innovations. *Journal of Applied Finance*. Vol. 18 (Spring/Summer). 8-15.

Maull, R. and Childe, S. (1994) 'Business process reengineering: an example from the banking sector', *International Journal of Service Industry Management*, Vol. 5, No. 3, pp.26–34.

McAdam, D. and Scott, W. R. 2005. "Organizations and movements". In *Social Movements and Organization Theory*, Edited by: Davis, G. F., McAdam, D., Richard Scott, W. and Zald, M. N. 4–40. Cambridge: Cambridge University Press.

McAdam, D., McCarthy, J. D., & Zald, M. N. (1996). Introduction: Opportunities, mobilizing structures, and framing processes—Toward a synthetic, comparative perspective on social movements. In D. McAdam, J. D. McCarthy, & M. N. Zald (Eds.), *Comparative perspectives on social movements: Political opportunities, mobilizing structures and cultural framings* (pp. 1–20). New York: Cambridge University Press.

McGrath J.E. & Tschan F. (2004) Dynamics in Group and Team. Groups as Complex Action Systems. In Poole, M. S. and Van de Ven, A. H. (eds.) (2004). *Handbook of Organizational Change and Innovation.* (pp.50-72). New York: Oxford University Press.

McKinsey (2016), *Disruption and connection: Cracking the myths of China Internet finance intervention.* McKinsey Publication.

Menor, L.J. and Roth, A.V. (2008) 'New service development competence and performance: an empirical investigation in retail banking', *Production and Operations Management*, Vol. 17, No. 3, pp.267–284.

Mention A-L and Torkkeli M. (2012) Driver, process and consequences of financial innovation: A research agenda. *International Journal of Entrepreneurship and Innovation Management* 16.1 (2012): 5-29.

Mention A-L and Torkkeli M. (Editor) (2014) *Innovation in Financial Services - A Dual Ambiguity.* Cambridge Scholars Publishing.

Merton R. (1992) Financial Innovation and Economic Performance. *Journal of Applied Corporate Finance*, 4 (Winter): 12-22 Cambridge Scholars Publishing.

Merton, R. (1995) 'A functional perspective on financial intermediation', *Financial Management*, Vol. 24, No. 2, pp.23–41.

Meyer, J. R. & Rowan, B. (1977). Institutionalized organizations: Formal structure as myth and ceremony. *American Journal of Sociology,* 83, 340–363.

Miller, M.H. (1986) 'Financial innovation: the last twenty years and the next', *Journal of Finance and Quantitative Analysis*, Vol. 21, No. 4, pp.459–471.

Mintzberg, H., and Waters, J.A., (1985) Of strategies, deliberate and emergent. *Strategic Management Journal.* 6. 257-272.

Mintzberg, H., Raisinghani, D., & Theoret, A. (1976). The structure of "unstructured" decision processes. *Administrative Science Quarterly*, 21, 246-275.

Misangyi, V.F., Weaver, G.R., & Elms, H. (2008). Ending corruption: The interplay among institutional logics, resources, and institutional entrepreneurs. *Academy of Management Review, 33*(3), 750–770.

Mishkin F. (2007) *The Economics of Money, Banking, and Financial Marke*ts, Eighth Edition. Pearson Addison Wesley.

Nair, A. and Kloeppinger-Todd, R. (2007), *Reaching Rural Areas with Financial Services: Lessons from Financial Cooperatives in Brazil, Burkina Faso, Kenya, and Sri Lanka*, The World Bank, Washington, DC.

National Research Council (2009) 21st Century Innovation Systems for Japan and the United

States: Lessons from a Decade of Change: Report of a Symposium, *National Academies Press*.

Nonaka, I. (1990). Redundant, overlapping organization: a Japanese approach to managing the innovation process. *California Management Review.* (Spring), 27–38.

North, D. C. (1990). *Institutions, institutional change, and economic performance*. New York: Cambridge University Press.

NRI (2014a), *Risks and opportunities in China's growing P2P lending market*, Lakyara Vol.202. Nomura research Institute.

NRI (2014b), China's financial reform roadmap unveiled at Third Plenum, *Lakyara* Vol.185. Nomura research Institute.

Oak, Charmaine. 2013. "Special Report China Digital Money in 2013." S*hiftThought*, p. 65.

OECD (2005). *Oslo Manuals. Guidelines for Collecting and Interpreting Innovation Data, 3*rd edition // *OECD*, Paris.

Oliver, C. (1991). Strategic responses to institutional processes. *Academy of Management Review,* 16, 145–179.

Oliver, C. (1992). The antecedents of deinstitutionalization. *Organization Studies,* 13, 563–588.

Ordanini, A.; Miceli, L.; Pizzetti, M.; Parasuraman, A. (2011). "Crowd-funding: Transforming customers into investors through innovative service platforms". Journal of Service Management 22 (4): 443.

Orton, J.D. (1997). From Inductive to Iterative Grounded Theory: Zipping the Gap Between Process Theory and Process Data. *Scandinavian Journal of Management,* 13 (4): 419-438.

Papastathopoulou, P., Gounaris, S. and Avlonitis, G. (2006) 'Successful new to the market versus 'me-too' retail financial services: the influential role of marketing, sales, E.D.P./systems and operations', *International Journal of Bank Marketing*, Vol. 24, No. 1, pp.53–70.

Patton, M.Q. (1990). *Qualitative Evaluation and Research Methods. (*2nd Ed.). Newbury Park, CA: Sage. (1st Ed. 1980. Qualitative Evaluation Methods. Beverly Hills, CA: Sage).

PBOC (2002), *Commercial Banks in County Economies,* The People's Bank of China, Beijing.

Pettigrew, A. (1990). Longitudinal field research on change: Theory and practice. *Organization Science*, 1, 267–292.

Pfeffer, J. & Salancik, G. R. (1978). *The external control of organizations.* New York: Harper and Row.

Phillips, N., Lawrence, T.B., & Hardy, C. (2000). Inter-organizational collaboration and the dynamics of institutional fields. *Journal of Management Studies, 37*(1), 23–44.

Phillips, N., Lawrence, T.B., & Hardy, C. (2004). Discourse and institutions. *Academy of Management Review, 29*(4), 635–652.

Ping, L. (2011), *What regulatory policies work for emerging markets?,* ADBI Working Paper

265, Asian Development Bank Institute, Tokyo.

Pol, Eduardo.(2009) *Regulating financial innovations without apology*. WP 09-01, University of Wollongong, March, 2009.

Poole M.S. (2004) *Central Issues in the Study of Change and Innovation* . In Poole, M. S. and Van de Ven, A. H. (eds.) (2004). Handbook of Organizational Change and Innovation. (pp.3-31). New York: Oxford University Press.

Poole, M. S. and Van de Ven, A. H. (2005). Alternative Approaches for Studying Organizational Change. *Organization Studies* 26(9): 1377–1404. SAGE Publications (London, Thousand Oaks, CA & New Delhi).

Poole, M. S., Van de Ven, A. H., Dooley, K., & Holmes, M. E. (2000*). Organizational change and innovation processes: Theory and methods for research.* New York: Oxford University Press.

Powell, W. W. & DiMaggio, P. J. (Eds.) (1991). *The new institutionalism in organizational analysis.* Chicago: University of Chicago Press.

PWC (2010), *Foreign Banks in China*, PricewaterhouseCoopers, London.

PWC (2012), *Foreign bank in China.* PricewaterhouseCoopers Limited. July 2012.

PWC (2015). *The future of funds distribution in Asia,* PWC Asia.

PWC .(2014). *Retail Banking 2020 Evolution or Revolution?* PwC Publication.

Rao, H., Morrill, C., & Zald, M.N. (2000). *Power plays: How social movements and collective action create new organizational forms.* In B. Staw & R.I. Sutton (Eds.), *Research in organizational behavior* (Vol. 22*,* pp. 239–282). New York: JAI Press.

Reay, T., Golden-Biddle, K., & GermAnn, K. (2006). Legitimizing a new role: Small wins and micro-processes of change. *Academy of Management Journal, 49*(5), 977–998.

Rizopoulos Y.A. and Sergakis D.E. (2010) MNEs and policy networks: Institutional embeddedness and strategic choice, *Journal of World Business,* Volume 45, Issue 3, July 2010, Pages 250-256, ISSN 1090-9516.

Roberts, P.W. and Amit, R. (2003) 'The dynamics of innovative activity and competitive advantage: the case of Australian retail banking, 1981 to 1995', *Organization Science*, Vol. 14, No. 2, pp.107–122.

Rogers E.M. (2003). Diffusion of Innovation (5th Ed.) // *New York, NY 10020: The Free Press*.

Rogers, E. M. (1995). *The diffusion of innovations* (4th ed.). New York: Free Press.

Romelaer P. (2015) *Innovation processes: has research developed a complete set of models for research and management purpose?* Conference at the Department of Innovation Entrepreneurship and Strategy, School of Economics and Management, Tsinghua University, Beijing; March 18, 2015.

Rossignoli, B. and Arnaboldi, F. (2009) 'Financial innovation: theoretical issues and empirical evidence in Italy and in the UK', *International Review of Economics*, Vol. 56, No. 3, pp.275–301.

Ruttan, V. W. (2001). *Technology, growth, and development: An induced innovation perspective.* New York: Oxford University Press Sage.

Sahlin-Andersson, Kerstin and Lars Engwall, eds. (2002). *The Expansion of Management Knowledge*. Stanford, CA: Stanford University Press.

Saunders, B., Sim, J., Kingstone, T. et al. (2018) Saturation in qualitative research: exploring its conceptualization and operationalization. *Qual Quant* 52, 1893–1907 (2018).

Scheuing, E. and Johnson, E. (1989) 'NPD and management in financial institutions', *International Journal of Bank Marketing*, Vol. 7, No. 2, pp.17–21.

Schoonhoven, C. B. & Romanelli, E. (2001). *Emergent themes and the next wave of entrepreneurship research.* In C. B. Schoonhoven & E. Romanelli (Eds.), The entrepreneurship dynamic: Origins of entrepreneurship and the evolution of industries (pp. 383–408). Stanford, CA: Stanford University Press.

Schueffel, P. E., & Vadana, I. I. (2015). Open innovation in the financial services sector – a global literature review. *Journal of Innovation Management, 3*(1*)*, 25-48.

Schumpeter J.A. (1934). The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interests and The Business Cycle // London: *Oxford University Press*.

Schwarcz S. (2008) Systemic Risk. *Georgetown Law Journal*, 97: 193-249 Science Quarterly, Vol. 42 No. 1, pp. 1-34.

Scott, W. R., Ruef, M., Mendel, P. J., & Caronna, C. (1999). *Institutional change and healthcare organization: From professional dominance to managed care.* Chicago: University of Chicago Press.

Scott, W. Richard, Martin Reuf, Peter J. Mendel, and Carol Caronna. 2000. *Institutional Change and Health Care Organizations*: *From Professional Dominance to managed Care*. Chicago: University of Chicago Press.

Scott, W.R. (2001). *Institutions and organizations.* Thousand Oaks, CA: Sage.

Selznick, P. (1957). *Leadership in administration*. New York: Harper and Row.

Seo M.G, Putnam L.L & Bartunel J.M. (2004) *Dualities and Tesnsions of Planned Organizational Change*. In Poole, M. S. and Van de Ven, A. H. (eds.) (2004). *Handbook of Organizational Change* and Innovation. (pp.73-107). New York: Oxford University Press.

Shen C.H, Lu C.H. & Wu M.W. (2009). Impact of Foreign Bank Entry on the Performance of Chinese Banks. *China & World Economy* / 102 – 121, Vol. 17, No. 3, 2009.

Sherer, P. D. & Lee, K. (2002). Institutional change in large law firms: A resource dependency and institutional perspective. *Academy of Management Journal,* 45, 102–120.

Shi, J.P. (2004), *Historical movement for Chinese banking regulatory system,* Financial Times, 19 April.

Shiha V., Zhang Q., and Liu M.X. (2007) Comparing the performance of Chinese banks: A principal component approach, *China Economic Review*, Volume 18, Issue 1, 2007, Pages

15–34.

Shin, N. and Jemella, D. (2002) 'Business process reengineering and performance improvement: the case of Chase Manhattan Bank', *Business Process Management Journal*, Vol. 8, No. 4, pp.351–363.

Shrader L. and Duflos E. (2014). *China: A New Paradigm in Branchless Banking*? Consultative Group to Assist the Poor March 2014.

Silber W. (1983) The Process of Financial Innovation. *American Economic Review Papers and Proceedings,* 73: 89-95.

Silverman, D. (2001). *Interpreting Qualitative Data: Methods for Analysing Talk, Text and Interaction.* (2nd Ed.). London: Sage.

Sine, W.D., & David, R. (2003). Environmental jolts, institutional change, and the creation of entrepreneurial opportunity in the US electric power industry. *Research Policy, 32* (2), 185–207.

Slack, N., & Lewis, M. (2011). *Operations Strategy*. 3rd ed. Harlow, England: Pearson Education Limited.

Song, Q. (2008), *Government's role in the reform of banking system: evidence from Chinese state-owned commercial banks,* Northeast Decision Sciences Institute Proceedings, New York, NY, 28-30 March.

Storey, C. and Easingwood, C. (1996). Determinants of new product performance: A study in the financial services sector. *International Journal of Service Industry Management*, 7 (1), 32-55.

Strang, D., & Sine, W.D. (2002). Inter-organizational institutions. In J. Baum (Ed.), *Companion to organizations* (pp. 497-519). Oxford, UK: Blackwell.

Strauss, A.L. 1987. *Qualitative Analysis for Social Scientists*. New York: Cambridge University Press.

Stryker, R. (2000). Legitimacy processes as institutional politics: Implications for theory and research in the sociology of organizations. *Research in the Sociology of Organizations*, 17, 179-223.

Stuart, T. (2000). Interorganizational alliances and the performance of firms: A study of growth and innovation rates in a high-technology industry. *Strategic management journal,* 21(1), 791-811.

Suddaby, R., & Greenwood, R. (2005). Rhetorical strategies of legitimacy. *Administrative Science Quarterly, 50* (1), 35–67.

Sveiby, K.E. (2012) 'Innovation and the global financial crisis – systemic consequences of incompetence', *International Journal of Entrepreneurship and Innovation Management*, in press.

Tan, J.J. and R.J. Litschert (1994). Environment-strategy relationship and its performance implications: An empirical study of the Chinese electronics industry. *Strategic Management Journal*, 15, 1-20.

Tiwana, A. (2008). Does interfirm modularity complement ignorance? A field study of software outsourcing alliances. *Strategic Management Journal*, *29* (11), 1241– 1252.

Tolbert, P. S. & Zucker, L. G. (1983). Institutional sources of change in the formal structure of organizations: The diffusion of civil service reform, 1880–1935. *Administrative Science Quarterly,* 28, 22–29.

Tufano, P. (1989). Financial innovation and first-mover advantages. *Journal of Financial Economics*, 25 (2), 213-240.

Tufano, P. (2003) 'Financial innovation', in Constantinides, G.M., Harris, M. and Stulz, R. (Eds.): *Handbook of the Economics of Finance: Corporate Finance*, 1685 pp, 1A, 307-336, Elsevier, New York.

Tuzlukaya S. & Kirkbesoglu E. (2015) A Theoretical Model for Institutional Change: The Relationship, between Institutional Entrepreneurship and Social Capital, International *Journal of Business and Management; 10 (3)*; 2015.

Uprety, I. (2009). Six Sigma in banking services: A case study-based approach. *International Journal of Six Sigma and Competitive Advantage*, 5 (3), 251-271.

Valle S. & Vázquez-Bustelo D. (2009) Concurrent engineering performance: Incremental versus radical innovation. *International Journal of Production Economics*, Volume 119, Issue 1, May 2009, Pages 136-148.

Van de Ven A., Angle H., and Poole M.S. (eds.) (1989) *Research on the Management of Innovation: The Minnesota Studies.* New York: Ballinger Publishing/Harper and Row.

Van de Ven and Hargrave (2004) *Social, Technical, and Institutional Change, A Literature Review and Synthesis.* In Poole, M. S. and Van de Ven, A. H. (eds.) (2004). Handbook of Organizational Change and Innovation. (259-303). New York: Oxford University Press.

Van de Ven, A. (1995) Managing the process of organizational innovation. In *Organizational Change and Redesign. Ideas and Insights for Improving Performance*, eds G.P. Huber and W.H. Glick, 269-294. Oxford University Press.

Van de Ven, A. H. & Grazman, D. N. (1999). *Evolution in a nested hierarchy: A genealogy of Twin Cities health care organizations, 1853–1995*. In J. A. C. Baum & B. McKelvey (Eds.), Variations in organizational science: In honor of Donald T. Campbell (pp. 185–212). Thousand Oaks, CA: Sage.

Van de Ven, A. H. & Poole, M. S. (1995). Explaining development and change in organizations. *Academy of Management Review,* 20, 510–540.

Van de Ven, A. H. and Poole, M. S. (2005). Alternative approaches for studying organizational change. *Organization Studies* 26 (9): 1377-1404. SAGE Publications (London, Thousand Oaks, CA & New Delhi).

Van de Ven, A. H. and Sun. K.Y (2011). Breakdowns in Implementing Models of Organization Change. *Academy of Management Perspectives* (August.,2011), 58-74.

Van De Ven, A.H., Polley, D.E., Garud, R., Venkataraman, S., (1999) *The Innovation Journey. Administrative Science Quarterly*. Oxford University Press, 1999.

Vaughan, D. (1992). *Theory elaboration: The heuristics of case analysis. In C. Ragin & H. Becker (Eds.), What is a case?* 173-202. New York: Cambridge University Press.

Vermeulen, P. (2004). Managing product innovation in financial services firms. *European Management Journal*, 22 (2), 43-50.

Vermeulen, P. and Dankbaar, B. (2002). The organisation of product innovation in the financial sector. *Service Industries Journal*, 22 (3), 77-98.

Vives, X. (2001) 'Competition in the changing world of banking', *Oxford Review of Economic Policy*, 17 (4), 535-547.

Wade, J. B., Swaminathan, A., & Saxon, M. S. (1998). Normative and resource flow consequences of local regulations. *Administrative Science Quarterly,* 43, 905-935.

Wang C., Kafouros M. (2009). What Factors Determine Innovation Performance in Emerging Economies? Evidence from China // *International Business Review,* 6 (6), 606-616.

Wang K. (2013). The rise of online finance in China and the legal grey area. E-*Finance & Payments Law & Policy* - October 2013

Wang Yu (2009) *A relationship study of strategy changes and enterprise performance in different external environment.* West South Financial University Publication. ISBN 9787811380125

Weber, M. (1968). *Economy and society: An interpretive sociology. Three volumes.* G. Roth & C.Wittich (Eds.) New York: Bedminister Press. (Original work published 1924)

Westphal, J. D., Gulati, R., & Shortell, S. M. (1997). Customization or conformity? An institutional and network perspective on the content and consequences of TQM adoption. *Administrative Science Quarterly,* 42, 366–394

Wheelwright, S. C. & Clark, K. B. (1992). *Revolutionizing product development*. New York: The Free Pres

Wijen, F., & Ansari, S. (2007). Overcoming inaction through collective institutional entrepreneurship: Insights from regime theory. *Organization Studies, 28* (7), 1079–1100.

Woo, K.L. (2017), How Chinese commercial banks innovate: process and practice, *Journal of Innovation Management* JIM 5, 2 (2017) 81-110.

Woodward, J., (1958): *Management and Technology*. London: Her Majesty's Stationery Office

Wright, P., M. Kroll, B. Pray, and A. Lado (1995). Strategic orientations, competitive advantage and business performance. *Journal of Business Research*, 33, 143-151.

WSJ (2014). *China's Bank to cap Smartphone Payment.* 2014-3-26 published. http://online.wsj.com/articles/SB10001424052702304679404579459012801071676 accessed on 2014 Nov 20

Yang, S-C., Tu, C. and Yang, S. (2009). Exploring the solution: The contextual effect on consumer dissatisfaction and innovativeness in financial service companies. *The Service Industries Journal*, 29 (4), 557-568.

Yang, X. (2002). General Financial History of China (In Chinese). Beijing: *China Finance*

Publishing House.

Yang, Xiaoming, Sun, Sunny & Lee, Ruby (2016) Micro-innovation strategy: The case of WeChat. *Asian Case Research Journal,* 20, 401-427.

Yao Dewei, Zhuang Yumin, (2004). Financial innovation microeconomics theory and empirical study (in Chinese), *Journal of Finance and Economics,* 9, 47-55

Yao L. (2014), *Policy discussion of internet finance in China*, BOFIT Policy Brief 2014 No. 13. Bank of Finland, BOFIT Institute for Economies in Transition.

Yao S., Jiang C., Feng G. and Willenbockel D. (2007). *On the Efficiency of Chinese Banks And WTO Challenges,* working paper.

Yildirim, H.S. and Philippatos, G.C. (2007). Restructuring consolidation and competition in Latin American banking markets. *Journal of Banking and Finance*. 31 (3), 629-639.

Yin, Robert K.(2009) *Case Study Research. Design and Methods* (4th ed.). Sage Publications, Thousand Oaks.

Zhao, A.L., *et al.* (2008). Perceived risk and Chinese consumers' internet banking service adoption. *International Journal of Bank Marketing, 2008*. 26(7): p. 505-525.

Zhu, M. X. (2013). An empirical study of correlation between innovative capability and risk supervision of China's listed commercial banks. *Journal of Financial Development Research*, 4, 62.

RÉSUMÉ

Cette recherche vise à comprendre le processus et le modèle d'innovation financière adoptés par les grandes banques commerciales et les grandes entreprises FinTech opérant en Chine. Une étude qualitative basée sur le modèle de processus, la méthode des cas étendus et l'approche des études de cas multiples est appliquée. Six banques sont sélectionnées sur la base de afin d'identifier les thèmes et les modèles basés sur des comparaisons par paire et pragmatiques. Les principales théories appliquées sont celles de l'innovation et du changement institutionnel.
Le choix du modèle d'innovation est affecté par la structure institutionnelle, la propriété, la trajectoire, le modèle d'entreprise, l'approche réglementaire et les objectifs d'innovation de la banque étudiée.La réglementation peut être un catalyseur ou un frein à l'innovation financière, selon le degré de cohérence entre la stratégie d'innovation des banques et la politique du gouvernement local. La pression sur les performances stimule l'innovation, tandis que la bureaucratie et la trajectoire organisationnelles constituent des obstacles majeurs à l'innovation.

MOTS CLÉS

Changement institutionnel, innovation financière, dialectique de la réglementation, banque chinoise et FinTech

ABSTRACT

This research aims to understand the financial innovation process and model adopted by large commercial banks and large FinTech firms operating in China. A qualitative study based on process model, extended case-method and multiple case-study approach are applied in this research,. Six case-study banks are selected based on “maximum difference” approach to identify themes and patterns based on pair and pragmatic comparisons. The primary theories applied are innovation and institutional change theories.

The choice of innovation model is affected by the case-study bank’s institutional structure, ownership, trajectory, business model, regulatory approach and innovation objectives. Each firm undertakes a different path of institutional change and collectively affect the overall institutional arrangement. Regulation can be catalyst or hindrance to financial innovation, depending upon the degree of coherence between the banks’ innovation strategy and local government policy. Performance pressure helps drive innovation, whereas organizational bureaucracy and trajectory are major barriers to innovation.

KEYWORDS

Institutional Change, Financial Innovation, Regulation Dialectic, Chinese Bank and FinTech