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A la mémoire de mon père, disparu trop tôt.

« L’université de Strasbourg n’entend donner ni approbation, ni improbation aux opinions exprimées dans cette thèse. Ces opinions doivent être considérées comme propres à son auteur »

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Sommaire

Liste des abréviations et des acronymes

ASS:	Afrique Subsaharienne
BAD:	Banque Africaine de Développement
BCEAO:	Banque Centrale des Etats de l'Afrique de l'Ouest
BEAC:	Banque des Etats de l'Afrique Centrale
BRVM:	Bourse Régionale des Valeurs Mobilières
BVMAC:	Bourse des Valeurs Mobilières de l'Afrique Centrale
CEMAC:	Communauté Economique et Monétaire de l'Afrique Centrale
DTF:	Distance to Frontier
EIB:	European Investment Bank
EU:	European Union
FE:	Fixed Effects
FMI:	Fonds Monétaire International
GCC:	Gulf Cooperation Council
GDP:	Gross Domestic Product
HHI:	Herfindhal-Hirschmann Index
IFS:	International Financial Statistics
IMF:	International Monetary Funds
LDCs:	Less Developing Countries
NBFIs:	Non-bank Financial Institutions
NIM:	Net Interest Margins
OECD:	Organisation for Economic Co-operation and Development
OLS:	Ordinary Least Squares
PAS:	Programmes d'Ajustement Structurel
PIB:	Produit Intérieur Brut
PME:	Petites et Moyennes Entreprises
PVD:	Pays en Voie de Développement
QIC:	Quasi-likelihood Information Criterion
RoA:	Return on Assets
RoE:	Return on Equity
SAPs:	Structural Adjustment Programs
SFA:	Stochastic Frontier Analysis
SMEs:	Small and Medium-sized Enterprises
SSA:	Sub-Saharan Africa
TE:	Technical Efficiency
UEMOA:	Union Economique et Monétaire Ouest Africain
USA:	United States of America
USD:	United States Dollar
WB:	Word Bank
WGI:	Worldwide Governance Indicators

Introduction

Les pays africains sont caractérisés par un cadre institutionnel immature. Ils ont connu ou connaissent encore pour la plupart des épisodes d'instabilité politique. Dans l'ensemble, et même si la dernière décennie a été marquée par des avancées significatives, la démocratie demeure souvent embryonnaire et fragile. La corruption et l'absence de séparation des pouvoirs rendent l'appareil judiciaire largement inopérant. De ce fait, ces pays n'offrent pas les meilleures conditions pour la protection des investisseurs et le respect des obligations contractuelles. Ces déficiences institutionnelles ont des conséquences sur l'activité économique dans sa globalité.

Ce contexte particulier est de nature à impacter les choix d'activités, les conditions d'exploitation ainsi que la performance et la stabilité des banques africaines. En effet, les secteurs bancaires africains présentent des caractéristiques intrinsèques reflétant les déficiences des cadres institutionnels nationaux ou régionaux dans lesquels elles opèrent : faible intermédiation, marges nettes d'intérêts élevés, maturité de court terme, conditions de prêts contraignantes. Articulée autour de trois essais empiriques, cette thèse met en perspective les contraintes institutionnelles qui pèsent sur l'activité d'intermédiation des banques avec l'objectif de contribuer à une meilleure compréhension des conditions dans lesquelles les banques africaines gèrent leurs activités. Ceci doit notamment permettre de mieux identifier les leviers d'action susceptibles de lever les contraintes qui pèsent sur le développement des activités d'intermédiation financière, mais également de caractériser les enjeux sectoriels auxquels les dirigeants comme les régulateurs des banques africaines doivent faire face.

Le chapitre 1 dresse tout d'abord un état des lieux des systèmes bancaires africains en mettant notamment l'accent sur la dimension historique de la construction des cadres institutionnels des pays africains. Ensuite, il analyse la manière dont la recherche en finance appréhende le lien existant entre, d'une part, les cadres institutionnels juridiques, politiques et administratifs et, d'autre part, les formes et le développement des institutions financières. A ce titre, nous verrons que les notions de tradition juridique et de qualité des institutions sont centrales dans la construction du cadre théorique liant cadre institutionnel et finance. La thèse présente ensuite trois essais originaux qui, en s'appuyant sur ce cadre, se penchent sur trois aspects particuliers des secteurs bancaires africains.

Dans le premier essai (chapitre 2), nous montrons comment la capacité des banques africaines à assurer efficacement l'intermédiation financière est notamment contrainte par le cadre contractuel, la protection des investisseurs et la qualité de la réglementation.

Une autre des conséquences des contraintes institutionnelles est la thésaurisation de réserves par les banques au détriment du secteur privé qui peine à accéder au financement externe. Dans le deuxième essai (chapitre 3), nous expliquons ce paradoxe par la faiblesse de la demande viable de crédit induite par les dysfonctionnements du marché du crédit.

Enfin, compte tenu des difficultés rencontrées dans l'intermédiation financière, les banques africaines modifient en partie leur business model en s'orientant vers des activités bancaires non-traditionnelles. Dans le dernier essai (chapitre 4), nous montrons que ce repositionnement a des conséquences sur la rentabilité et la stabilité des banques, notamment des plus petites qui ne disposent pas des ressources adéquates pour opérer sur ces nouveaux marchés.

Chapitre 1 - Le Système Bancaire Africain : un Système Bancaire sous Contraintes Institutionnelles

Avant d'aborder les trois essais empiriques, ce chapitre introductif présente, d'une part, les spécificités des systèmes bancaires africains et, d'autre part, la littérature sur les implications du cadre institutionnel sur les activités financières en général et l'activité bancaire en particulier. Ainsi, la première partie (1.1) s'attache d'abord à décrire le système bancaire africain : l'actionnariat, la concurrence, l'intermédiation de même que l'inclusion financière sont passés en revue. En prélude aux essais empiriques, la deuxième partie (1.2) mobilise la vaste littérature sur les institutions. Pour ce faire, cette section commence d'abord par retracer historiquement l'origine des institutions africaines, de l'Afrique précoloniale jusqu'au transfert institutionnel lors de la période coloniale et post-coloniale. Ensuite, elle fait le point sur l'approche *law & finance,* centrale dans la littérature sur les institutions et les différences de développement entre pays. Enfin, cette section s'affranchit de l'origine légale des institutions et montre comment au-delà, la qualité institutionnelle conditionne l'activité bancaire. La mobilisation de ces deux premières parties du chapitre permet ainsi de proposer trois essais empiriques contribuant globalement à une meilleure compréhension des conditions d'exercice des banques africaines. Avant de les aborder plus en détails dans les chapitres suivants, ces trois essais sont présentés brièvement dans la dernière partie de ce chapitre introductif (1.3).

1.1. Le système bancaire africain : éléments descriptifs

Aux premières heures des indépendances, le système bancaire africain était largement hérité de la colonisation. Les seules banques présentes sur le continent étaient détenues par les grands groupes des différentes puissances coloniales. Ces banques servaient principalement les intérêts commerciaux, économiques et politiques de ces nations (Alibert, 1983). Durant la période postcoloniale, plusieurs changements interviennent. Dans la majorité des nouveaux Etats, les banques déjà existantes sont nationalisées et de nouvelles voient également le jour, détenues principalement par les pouvoirs publics. Dès lors, l'Etat a une emprise sur le secteur financier et des contraintes sévères sont imposées aux banques dans leur fonctionnement et leurs missions. D'une part, elles sont amenées à financer les déficits budgétaires récurrents. D'autre part, des politiques d'encadrement du crédit sont mises en place en vue de rediriger les fonds disponibles vers certains secteurs qualifiés de prioritaires. Tous ces facteurs conduisent à une forme de répression financière (Schuler, 2003). Ces politiques ont également des effets néfastes sur les performances bancaires, les épargnants et les emprunteurs, contribuant à maintenir le système bancaire africain dans un état de perpétuel sous-développement.

Dans les années 1980, la situation économique dans la plupart des pays africains devient catastrophique : hausse continue des prêts improductifs, durcissement de la politique de répression financière, système bancaire globalement insolvable, inflation record, crises bancaires répétitives. Sous l'égide du Fonds Monétaire International (FMI) et de la Banque Mondiale (BM), la plupart des pays africains sont soumis aux Programmes d'Ajustement Structurel (PAS) avec un volet important portant sur le secteur financier. Des mesures de restructuration sont mises en œuvre : réduction de la répression financière, privatisations et

ouverture du capital des banques locales aux investisseurs étrangers (Duruflé, 1988 ; Servant, 1991). Cependant, la libéralisation financière n'a pas satisfait tous les espoirs qui étaient placés en elle. Pour cause, elle n'a pas entrainé un développement du secteur financier en Afrique comme initialement prévu (Chouchane-Verdier, 2004). En effet, l'analyse de l'évolution du ratio crédit au secteur privé rapporté au PIB dans les pays africains et dans les autres Pays en Voie de Développement (PVD) montre que la libéralisation financière n'a pas favorisé l'expansion du crédit au secteur privé pour ce qui est des pays africains (Kpodar, 2005). Au contraire, celle-ci s'est accompagnée d'une contraction du crédit, une persistance de taux d'intérêt élevés, de l'inflation et de l'interventionnisme étatique matérialisé cette fois-ci par l'éviction des crédits aux agents privés au profit des titres de dette publique.

Dans la période récente, on note cependant une nette volonté de la part des pays africains de reformer leur secteur bancaire. Ces pays cherchent à améliorer le climat des affaires, à promouvoir le financement du secteur privé et la microfinance, ainsi qu'à accompagner l'émergence du *Mobile Banking*. Même si le système bancaire africain demeure sous-développé et réticent à prêter au secteur privé, les banques sont dans l'ensemble stables, suffisamment capitalisées et en situation de surliquidité (Beck & Cull, 2014).

Les sections suivantes décrivent l'état actuel du secteur bancaire africain. D'abord, nous présentons la structure du système bancaire africain en termes d'actionnariat et de concurrence. Ensuite, l'intermédiation financière, fonction principale de ces banques, est abordée. Enfin, les dernières sections font le point sur l'inclusion financière mais aussi le système financier non bancaire. Les indicateurs fournis permettent de dresser un portrait mettant ainsi en exergue la singularité du système bancaire africain par rapport aux autres pays, notamment ceux en développement.

1.1.1. Structure de propriété : coexistence entre banques locales et banques étrangères

L'évolution historique du système bancaire africain confère aux banques africaines une structure de propriété particulière. En effet, après la vague de nationalisation postindépendance, les banques étrangères ont regagné du terrain à partir des années 1980 suite aux politiques de libéralisation financière. Les banques publiques et locales privées en faillite à l'époque sont reprises par des investisseurs étrangers. La mondialisation et l'intégration croissante du continent dans le commerce international ont de plus renforcé la part de marché des banques étrangères. De nos jours, le système bancaire africain est donc caractérisé par une coexistence entre, d'une part, les banques locales et, d'autre part, les banques étrangères.

Entre 1995 et 2009[1], le nombre de banques étrangères présentes sur le continent a presque doublé passant de 120 à 227. En termes de proportion, cela correspond à un passage de 39% de banques étrangères sur le continent en 1995 à 51% en 2009. Cette même année, les banques étrangères détenaient plus de la moitié des actifs bancaires du continent. A titre de comparaison, seuls les pays d'Europe de l'Est de d'Asie centrale ont une proportion et une part de marché de banques étrangères plus importantes, conséquences d'une forte pénétration des banques étrangères après la guerre froide, et de l'intégration de certains de ces pays dans l'Union Européenne. Cependant, ces statistiques agrégées cachent des différences significatives entre pays. Ainsi, des pays comme l'Ethiopie et l'Erythrée ont leur système bancaire pratiquement fermé aux capitaux étrangers. A l'inverse, au Botswana, en Côte d'Ivoire, en Guinée-Bissau, au Mali, en Mauritanie, en Namibie, au Niger, au Sénégal, ou encore au Tchad, les banques étrangères contrôlent entre 60% à 80%

[1] Les statistiques citées dans ce paragraphe sont pour l'ensemble tirées de Beck *et al*. (2014)

des actifs bancaires. Enfin, au Benin, au Burkina Faso, au Lesotho, à Madagascar, au Mozambique et en Zambie, le paysage bancaire est presque dominé en totalité par les banques étrangères (Beck *et al.,* 2014).

Si les banques étrangères présentes sur le continent africain ont été historiquement des banques européennes, on constate l'arrivée récente de banques en provenance d'économies émergentes telles que la Chine et l'Inde. Cette percée est conforme au changement d'ensemble des économies africaines. En effet, d'une part, des pays comme la Chine ou l'Inde investissent de plus en plus sur le continent et, d'autre part, les pays africains privilégient désormais la coopération et les échanges Sud-Sud. Parallèlement, on assiste également à l'émergence sans précédent de banques régionales, communément appelées banques panafricaines. Les banques panafricaines sont des banques ayant leur siège dans des pays africains et qui étendent leurs activités sur le continent africain. Ces banques sont généralement originaires de pays africains ayant les systèmes bancaires les plus développés du continent, à savoir l'Afrique du Sud, le Nigéria, le Maroc et le Kenya. Les banques panafricaines constituent désormais des concurrents sérieux aux banques étrangères originaires des économies développées et émergentes (Léon, 2016). Ecobank, symbole de ces banques panafricaines, a ainsi triplé sa présence dans les pays africains entre 2000 et 2013, passant de 11 pays à 32. Par ailleurs, elle détient plus de 10% des actifs bancaires dans 13 pays où elle est implantée. A titre de comparaison, la Société Générale, plus grande banque étrangère sur le continent en termes d'empreinte géographique, n'est implantée que dans 17 pays. Dans l'ensemble, parmi les banques étrangères, seulement 4 détiennent plus de 10% des actifs bancaires dans au moins 3 pays où elles sont implantées (Beck *et al.*, 2014).

Les banques panafricaines, même si elles sont relativement récentes, sont performantes car elles ont l'avantage de bénéficier du « meilleur des deux mondes » (Zins & Weill, 2018). D'une part, elles profitent des avantages liés aux banques étrangères en s'appuyant sur un large réseau et une bonne expertise du domaine bancaire. D'autre part, elles bénéficient des atouts liés aux banques locales en ayant une meilleure connaissance du marché local et du cadre institutionnel en place. Les banques panafricaines jouent ainsi un rôle central dans le financement du secteur privé africain et l'inclusion financière. Elles prêtent aux PME et autres clientèles rurales souvent délaissées par les banques étrangères. Leon & Zins (2019) montrent ainsi que l'émergence des banques panafricaines augmente l'accès au financement des entreprises et favorise relativement l'accès aux services financiers par la classe moyenne.

1.1.2. Structure du marché : un marché concentré et peu compétitif

Malgré la diversité de l'actionnariat au sein du système bancaire africain, le marché est en fait peu compétitif compte tenu de la concentration des parts de marché sur une poignée de banques. En effet, la concentration est l'une des caractéristiques des secteurs bancaires africains. Beck *et al.* (2011a), sur un échantillon de 80 pays, comparent la concentration bancaire entre les pays africains et le reste du monde en utilisant le *Herfindhal-Hirschmann Index* (HHI) comme indicateur. Les résultats montrent que la majorité des pays dont l'IHH est supérieur à 2000 sont africains. A l'inverse, seulement 20% des pays africains ont un HHI inférieur à 2000. Cette tendance se confirme lorsque la concentration est mesurée par des indicateurs moins complexes tels que le ratio de concentration RC3. Le RC3 correspond à la part de marché des trois plus grandes banques. Ainsi, en moyenne les trois plus grandes banques détiennent 68% des parts de marché du secteur bancaire africain (Beck *et al.,* 2011b). De même, les 5 plus grandes banques se partagent 81% du marché dans le pays

africain médian, contre 64% en dehors du continent (Beck & Cull, 2014). Cependant, d'importantes disparités subsistent entre pays. Tandis que le RC3 est inférieur à 50% dans des pays ayant des systèmes bancaires relativement plus développés comme le Kenya, le Nigeria et l'Afrique du Sud, dans d'autres pays comme l'Algérie, l'Angola, le Malawi, l'Ile Maurice, ou encore le Soudan, les 3 plus grandes banques contrôlent plus de 85% du marché (Beck *et al.,* 2011b). Les coûts fixes élevés, associés au faible niveau de revenu et de profondeur financière dans la plupart des pays, entravent la croissance d'un grand nombre de banques.

La prise en compte d'un indicateur plus axé sur le pouvoir de marché des banques confirme le manque de concurrence dans le système bancaire africain. En effet, le *Lerner Index,* calculé par Beck *et al.,* (2011a) montre que le pouvoir de marché des banques est significativement plus élevé en Afrique que dans le reste du monde. Ainsi, les 6 pays ayant le *Lerner Index* le plus élevé sont tous africains. Il s'agit de l'Angola, de l'Ethiopie, du Cameroun, du Malawi, du Maroc, et du Soudan. Au niveau agrégé, le *Lerner Index* médian est de 30% dans le pays africain médian, contre 25% en dehors du contient (Beck & Cull, 2014).

Dans l'ensemble, cette concurrence limitée a des effets néfastes sur le secteur bancaire africain aussi bien en termes de profondeur financière que d'inclusion financière. Par ailleurs, les marges nettes d'intérêts et le coût élevé du crédit, observés dans le système bancaire africain, s'expliquent en partie par ce pouvoir de marché des banques.

1.1.3. Intermédiation financière : des banques qui prêtent peu

Le système bancaire africain est caractérisé par un faible niveau d'intermédiation et des prêts peu productifs (Beck *et al.,* 2010). En effet, en partant de l'activité traditionnelle des banques, à savoir la transformation des dépôts en prêts, on peut mesurer l'intermédiation bancaire par le ratio des prêts par rapport aux dépôts. Certes cet indicateur n'est pas complet, car les banques ont d'autres sources de financement que les dépôts et d'autres activités que les prêts au secteur privé, mais il a l'avantage de saisir leur activité de base. L'analyse de cet indicateur révèle que les banques africaines ne transforment que 74% de leurs dépôts en prêts contre 109% pour les banques des autres PVD (Beck *et al.,* 2011b). Cette situation est paradoxale d'autant plus que les banques africaines sont suffisamment capitalisées et en situation de surliquidité (Beck & Cull, 2014). Les ressources existent, mais elles ne sont pas utilisées dans le cadre de l'intermédiation bancaire, ce qui constitue un handicap majeur au financement du secteur privé. Les banques ont tendance à orienter leurs investissements vers les obligations d'Etat et les actifs liquides (Allen *et al.,* 2011). De même, les transactions dans le cadre de l'intermédiation financière sont axées sur le court terme. Ainsi, environ 60% des prêts bancaires sont à rembourser intégralement dans l'année et seulement moins de 2% sont remboursables à 10 ans (Beck *et al.,* 2011b). Cette structure d'échéance des contrats de prêts peut s'expliquer par la faiblesse du cadre institutionnel en matière de protection du droit des créanciers (Qian & Strahan, 2007).

Par ailleurs, le marché interbancaire est en sous-activité, signe d'immaturité du système bancaire africain. Le manque de confiance entre banques, les asymétries d'informations et les difficultés liées à la disponibilité et la qualité du collatéral contribuent à maintenir le marché interbancaire dans une situation de sous-développement (Gulde & Pattillo, 2006). Ce manque de dynamisme est renforcé par le fait que la majorité des banques africaines

disposent de liquidités excédentaires par rapport aux exigences prudentielles car elles jugent les possibilités de prêts risquées et limitées. De ce fait, elles n'ont donc pas besoin d'emprunter à court terme auprès d'autres banques.

Malgré la faiblesse de l'intermédiation financière, les banques ont tendance à réaliser des marges élevées en Afrique. Sur la période de 2000-2004, le taux de rendement des actifs des banques africaines représentait plus que le triple de celui des banques non africaines (2.1% contre 0.6%). En outre, le taux de rendement des capitaux propres culminait à 20.1% pour les banques africaines, tandis que dans le reste du monde, les banques peinent à atteindre 10% (8.5%). Globalement les banques étrangères sont plus rentables en Afrique, et cette tendance se vérifie pour les banques étrangères installées simultanément en Afrique et ailleurs. Ainsi, pour ces banques, leur plus forte performance est réalisée en Afrique (Honohan & Beck, 2007). En 2011, les marges nettes d'intérêts et les spreads de crédit s'élevaient respectivement à 5.9% et 10.3% dans la médiane des pays d'Afrique Subsaharienne (ASS) , contre 4.7% et 8.2% dans les autres PVD . De même la rentabilité des actifs était estimée à 2.1% en ASS contre 1.5% ailleurs sur la même période (Beck & Cull, 2014). En plus du manque de concurrence, ces marges nettes d'intérêts élevées peuvent être dues aux déficiences dans le cadre institutionnel (Demirguc-Kunt & Huizinga, 1999). Une meilleure application des contrats, une plus grande efficacité dans le système judiciaire et une absence de corruption sont associées à des marges d'intérêts nettes moins élevées. Ainsi les pays ayant une meilleure qualité institutionnelle devraient avoir des marges nettes d'intérêts relativement plus faibles. A l'inverse, des marges nettes d'intérêts élevées pourraient être synonymes d'offre insuffisante de crédit, de dysfonctionnement sur le marché de crédit notamment en termes de concurrence et de pouvoir de marché des banques. De ce fait, ces marges nettes d'intérêts élevées dans le système bancaire africain

permettent dans une certaine mesure de mettre en exergue les difficultés institutionnelles rencontrées par les banques.

1.1.4. Profondeur et inclusion financière : un système bancaire sous-développé et peu inclusif

De manière générale, le système bancaire africain est relativement sous-développé. Les plus grandes banques du continent restent de taille moyenne lorsqu'elles sont comparées aux banques des pays à revenu élevé. Par ailleurs, en prenant comme référence des pays à revenus comparables, on constate que le système bancaire du pays médian non africain est plus développé. Ainsi, sur des données de 2012, le ratio médian du crédit accordé au secteur privé en pourcentage du PIB était de 18% en Afrique, contre 25% dans les pays non-africains de même niveau (Beck & Cull, 2014). Selon le dernier rapport de la banque mondiale sur le développement financier (World Bank, 2018), le crédit accordé par les banques africaines au secteur privé représente en moyenne 21.3% du PIB. A titre de comparaison, ce ratio est en moyenne de 33.2% dans les pays d'Asie du Sud, 40.1% dans la région Europe et Asie Centrale, ou encore 42.2% pour les pays d'Amérique Latine.

En plus d'être sous-développé, le système bancaire africain est peu inclusif. L'accès aux services financiers demeure un challenge aussi bien pour les ménages que pour les entreprises (Demirgüç-Kunt & Klapper, 2012). Le dernier rapport de la banque mondiale sur l'inclusion financière à travers le monde, *Global Findex Database 2017*, (Demirgüç-Kunt *et al.,* 2018)[2] permet de caractériser l'état actuel de l'inclusion financière dans les pays africains. Dans l'ensemble, même si l'inclusion financière reste faible en Afrique, des

[2] Sauf indication contraire, les statistiques sur l'inclusion financière citées dans cette partie sont tirées de cette référence.

avancées significatives sont cependant à noter. L'émergence du *Mobile Banking* ces dernières années permet d'inclure une grande partie de la population, notamment rurale, dans le circuit bancaire.

En ce qui concerne l'accès aux comptes, en 2017, 43% des individus âgés de plus de 15 ans ont déclaré posséder un compte dans une banque ou un autre type d'institution financière formelle, ou avoir utilisé personnellement des services d'argent mobile au cours des 12 derniers mois. A titre de comparaison, la moyenne est de 63% dans les PVD. On note également une progression par rapport aux années précédentes. Ainsi, 34% des individus possédaient un compte en 2014 (Demirguc-Kunt *et al.,* 2015). Cependant, au-delà de ces statistiques agrégées, il existe des disparités selon le pays, le genre, le niveau d'éducation ou encore le revenu. En effet, alors que 47% des individus de sexe masculin possèdent un compte, la proportion est moindre chez les femmes avec seulement 37%. De même, dans les pays comme le Kenya, l'Ile Maurice et la Namibie, plus de 80% des individus sont détenteurs d'un compte, tandis qu'en République Centrafricaine et au Sud-Soudan, la proportion d'individus ayant un compte est inférieure à 15%. En général, les personnes plus âgées, riches, habitant en zone urbaine et ayant un niveau d'éducation élevé sont plus à même de posséder un compte. En Ethiopie et au Nigéria, l'écart entre les riches et les pauvres en termes de possession de compte est d'environ 20 points de pourcentage.

Le manque de ressources financières, le coût des services financiers, la distance, les documents requis mais aussi le manque de confiance vis-à-vis des banques sont les principales raisons invoquées par les personnes ne disposant pas de comptes auprès des institutions financières formelles en ASS. Ainsi, 71% des individus indiquent ne pas disposer de compte auprès d'une institution financière formelle parce qu'ils n'ont pas suffisamment de fonds pour en utiliser un, tandis que pour 29% le coût élevé des services

financiers constitue un obstacle. Pour plus de 25% des individus, la distance de même que la documentation requise pour ouvrir un compte sont des raisons qui les excluent du circuit financier formel. De même, environ 16% des individus n'ont pas confiance dans les institutions financières formelles.

L'émergence du *Mobile Banking* au cours de la dernière décennie contribue significativement à l'accès aux services financiers. L'ASS est ainsi la seule région au monde où la proportion des adultes (âgés de plus de 15 ans) ayant un compte d'argent mobile est supérieure à 10%. Le continent héberge les 10 pays au monde où le nombre d'adultes ayant des comptes d'argent mobile est supérieur à celui des adultes ayant un compte dans une institution financière. Environ 21% des adultes ont désormais recours au *Mobile Banking*, contre 12% en 2014. En Ouganda et au Zimbabwe, environ 50% des adultes disposent d'un compte d'argent mobile, tandis qu'au Kenya, l'un des pays précurseurs en la matière, cette proportion dépasse 70%. De 2014 à 2017, la proportion d'adultes disposant d'un compte d'argent mobile a augmenté deux fois plus vite que celle des individus disposant d'un compte traditionnel. Par ailleurs, dans certains pays, le *Mobile Banking* permet de réduire les inégalités à l'accès aux services financiers basées sur le genre et le revenu.

La faiblesse de l'inclusion financière a des conséquences sur la collecte de l'épargne et l'octroi de prêts par les banques africaines. L'épargne des ménages est en grande partie redirigée vers des structures de finance informelle telles les associations rotatives d'épargne et de crédit (tontines). Ainsi, en 2017, alors qu'environ 15% des adultes ont épargné à travers les institutions financières formelles, plus de 25% ont à l'inverse privilégié les associations de crédit ou des individus en dehors de la famille. En République Démocratique du Congo et en Côte d'Ivoire, à peine 5% des individus ont utilisé les

institutions financières pour leur épargne. Parallèlement, les comportements en matière d'emprunt suivent la même tendance. En 2017, 31% des adultes qui ont emprunté l'on fait à travers les amis ou la famille. A la même période, seulement 8% des individus ont obtenu un prêt auprès d'une banque ou d'une autre institution financière régulée. Dans l'ensemble, l'utilisation des espèces est largement répandue dans la plupart des pays. Seulement 7.7% des individus ont utilisé un compte traditionnel ou argent mobile, pour le paiement des factures en 2017. La tendance est la même pour ce qui est de la réception des salaires : 5.7% des individus ont utilisé un compte pour recevoir leur salaire du secteur privé, et 7.3% pour les transferts en provenance de l'Etat. Dans les pays comme l'Egypte, l'Ethiopie, et le Nigéria, les salaires du secteur privé sont versés principalement en espèces. En Ouganda, au Ghana, au Kenya et en Zambie, environ 60% des individus reçoivent leurs recettes de la vente de produits agricoles en espèces.

Au-delà des personnes physiques, les entreprises, surtout les PME, se trouvent également confrontées à la faiblesse de l'inclusion financière. En moyenne, dans les pays africains, le pourcentage d'entreprises ayant un compte bancaire est comparable à celui des entreprises des autres PVD. Pour illustration, 83% des petites entreprises et 94% des entreprises moyennes en Afrique possèdent un compte bancaire, comparées respectivement aux 87% et 93% des entreprises de même taille dans les autres PVD. Cependant, pour ce qui est de l'obtention de prêts et l'accès aux lignes de crédit, les entreprises africaines sont plus contraintes que celles des autres PVD. Ainsi, en Afrique, seulement 22% des entreprises ont un prêt ou bénéficient d'une ligne de crédit auprès d'une institution financière formelle, contre en moyenne 43% dans les autres PVD. Globalement, l'accès au financement demeure un handicap majeur pour les entreprises africaines : 45% des entreprises sondées placent le financement au premier rang des obstacles à leur développement. Et cet obstacle

est d'autant plus important si l'entreprise est petite. Par ailleurs, la structure financière des entreprises africaines permet de mettre en exergue les contraintes de financement auxquelles elles font face, notamment les PME. En effet, les ressources financières des PME sont composées à 84% d'autofinancement, 8% d'emprunts bancaires et moins de 2% de capitaux propres (Demirgüç-Kunt & Klapper, 2012). Plusieurs raisons permettent d'expliquer pourquoi les entreprises africaines sont contraintes quant à l'accès au financement externe. Ainsi, les taux d'intérêts élevés (14%), les procédures de demande (16%), le manque de collatéral (9%) et la nécessité de fournir souvent des pots de vins (4%) sont citées par les entreprises comme raisons pour lesquelles elles ne font pas de demande de prêt auprès des banques (Beck & Cull, 2014).

1.1.5. Le secteur financier non-bancaire : des marchés embryonnaires

Tout comme le secteur bancaire, le secteur financier non bancaire est également dans l'ensemble sous-développé en Afrique. La profondeur des marchés financiers, mesurée par la capitalisation boursière rapportée au PIB, est en moyenne d'environ 47% sur la période 2013-2015, contre 17% dans la région Europe et Asie Centrale, 26% en Asie du Sud, ou encore 63% en Amérique Latine (World Bank, 2018). L'Afrique compte 21 pays disposant de marchés boursiers. Certains pays partagent une bourse commune comme par exemple la Bourse Régionale des Valeurs Mobilières (BRVM) en Afrique de l'Ouest qui sert de marché boursier à l'ensemble des 8 huit pays de l'Union Economique et Monétaire Ouest Africain (UEMOA). De même, les pays de la Communauté Economique et Monétaire de l'Afrique Centrale (CEMAC) dispose d'une bourse commune, la Bourse des Valeurs Mobilières de l'Afrique Centrale (BVMAC) (Honohan & Beck, 2007 ; Beck *et al.,* 2011b). A l'exception de quelques places telles le Caire, Johannesburg et Lagos, la plupart des bourses africaines sont de taille réduite, illiquides et de faible capitalisation (Allen *et al.,*

2011 ; Mbeng Mezui, 2014 ; Ojah & Kodongo, 2015). Par ailleurs, le marché des obligations reste marginal. Le marché primaire est principalement dominé par les titres souverains et le marché secondaire est quasiment inexistant dans la plupart des pays à l'exception de l'Afrique du Sud et du Nigéria (Beck *et al.,* 2011b). Dans l'ensemble, les titres sont échangés sur des maturités courtes. Ainsi, en dehors de l'Afrique du Sud, la maturité moyenne des titres est inférieure à 5 ans (Mbeng Mezui, 2014). Beck *et al.* (2011b) expliquent les problèmes de taille et de liquidité des marchés de capitaux africains par les coûts élevés de cotation, la volonté de certaines entreprises de garder une structure de propriété familiale, les déficiences institutionnelles dans la protection des investisseurs, mais aussi le fait que ces marchés sont relativement récents.

De la même manière, le secteur des assurances peine à émerger, comparé aux autres PVD. Le taux de pénétration est faible, environ 1%. Les produits d'assurance non-vie et plus précisément les polices d'assurance automobile, santé et industrielle sont les plus répandus car souvent obligatoires. L'assurance-vie représente de ce fait moins de 30% des polices dans la plupart des pays. Même si les compagnies d'assurance sur le continent sont pour la plupart privées, dans certains pays les Etats détiennent toujours des parts significatives dans ces entreprises. Les défaillances dans la supervision et la régulation dans le secteur de l'assurance freinent le développement du marché des assurances. De même, le niveau de revenu relativement bas dans les pays africains, l'instabilité monétaire et la défaillance des cadres contractuels constituent des obstacles majeurs à l'essor des compagnies d'assurance (Allen *et al.,* 2011 ; Beck *et al.,* 2011b). Le continent enregistre également l'émergence de structures de capital-investissement. En effet, le fort taux de croissance économique de la dernière décennie a offert de nombreuses opportunités d'investissement autres que celles dans les industries d'extractions minières. Ces fonds sont surtout localisés dans l'UEMOA,

qui bénéficie d'un environnement macroéconomique stable en termes de maitrise de l'inflation, ou en Afrique du Sud qui a su capitaliser sur sa stabilité macroéconomique et politique. D'autres pays tels le Kenya, le Maroc, ou encore le Nigéria offrent également des opportunités aux sociétés de capital-investissement. Néanmoins, ces fonds sont encore récents, et ne pèsent que 0.11% du PIB en Afrique contre par exemple 0.74% pour le Royaume-Uni (Allen *et al.,* 2011 ; Rigouzzo, 2014 ; Ojah & Kodongo, 2015).

1.2. Le système bancaire africain : cadre institutionnel

La première partie de ce chapitre a mis en évidence le sous-développement des systèmes bancaires en Afrique sub-saharienne. Cet état de fait bien connu est notamment la résultante des cadres institutionnels qui structurent les sociétés africaines dans leurs dimensions politiques, sociales et également économiques et financières. Afin d'appréhender les contraintes institutionnelles susceptibles de déterminer les conditions d'exercice des banques des pays d'ASS et, dans une certaine mesure, d'expliquer les caractéristiques décrites dans la première section de ce chapitre, il est nécessaire de remettre en perspective les origines des institutions, notamment financières, dans ces pays. De manière générale, les cadres institutionnels, publics (institutions politiques, administratives et judiciaires) comme privés (droit des entreprises et des personnes notamment), ont très largement été marqués par la période coloniale qui a concerné la presque totalité du continent. La section 1.2.1 présente un rapide survol des phénomènes de transfert institutionnel qui caractérisent l'Afrique. La section 1.2.2 met en avant une dimension particulière de ce transfert, la tradition juridique. En effet, la distinction entre pays de tradition civiliste, d'une part, et de tradition de *common law*, d'autre part, a donné lieu à la théorie dite *law & finance*, reliant institutions financières et tradition juridique. Celle-ci a de fait structuré une grande partie

de l'analyse du lien entre droit et économie au cours des années 2000. Cependant, l'approche *law & finance* a donné lieu à de nombreux débats sur ses fondements comme sur ses résultats. Plus spécifiquement, la section 1.2.3 présente des travaux que l'on peut rassembler sous l'expression de « qualité des institutions » et qui reposent sur le postulat que ce sont non seulement les dimensions formelles des institutions qui déterminent la performance économique, mais également la capacité matérielle des pays à implémenter efficacement les cadres institutionnels existants.

1.2.1. De l'Afrique précoloniale à l'Afrique moderne : le transfert institutionnel

Pour mieux cerner les institutions africaines actuelles, il est d'abord utile de faire le point sur les pratiques qui existaient en Afrique bien avant l'arrivée des puissances coloniales. Ce rappel permettra ensuite de saisir les différentes mutations survenues lors de la colonisation, et finalement le transfert institutionnel qui en a découlé.

1.2.1.1. L'Afrique précoloniale

A l'époque précoloniale, deux grands ensembles institutionnels cohabitaient en Afrique : d'une part, les institutions islamiques et, d'autre part, la royauté africaine (Thiam, 2011).

Avant l'avènement du Prophète Mahomet, l'Arabie préislamique avait une organisation de type tribal. La tribu se caractérisait « par l'usage d'une langue commune, par une même croyance aux coutumes ancestrales et religieuses, mais aussi par la soumission à l'organisation tribale » (Thiam, 2011, p. 120). Le Sayid ou Rais faisait office de chef de tribu. Cette période était caractérisée par des jeux d'alliance entre tribus, le Hilf[3], ou alors

[3] Alliance entre deux tribus

des conflits, les Razzia[4]. L'an 622 marque le début de l'Hégire avec l'exil du prophète Mahomet à la Mecque. A sa mort en 632, presque toute l'Arabie est convertie à l'Islam. Ces successeurs poursuivent son œuvre en unifiant l'Arabie, et conquiert la Syrie et la Palestine. C'est dans ce contexte que le droit musulman pénètre en Afrique. Le droit musulman a eu une forte influence dans certains pays africains, comme le Sénégal.

A côté des pratiques musulmanes coexistait la royauté africaine. Cette royauté africaine se définit par son caractère sacré. Dans les sociétés africaines, le Roi est un personnage très respecté. Il a une origine ancestrale et mythique et est considéré comme le médiateur des dieux. Il est le garant de la stabilité de la communauté et est chargé d'appliquer et de faire respecter la coutume et les traditions. L'ensemble de ces coutumes et traditions forment le droit coutumier qui varie fortement selon les ethnies, les tribus, les royaumes et les empires. L'Afrique a connu plusieurs empires et royaumes prospères. Les plus marquants demeurent les empires soudanais[5]. Certains de ces empirent mêlaient coutume africaine et pratiques musulmanes. Cette dualité sera mise à rude épreuve lors de la période coloniale. D'abord, le droit musulman inspiré du Coran laissera place à la laïcité. Et ensuite dans les empires et royaumes, les Empereurs et Rois seront défaits, remplacés par des gouverneurs occidentaux.

1.2.1.2. L'Afrique coloniale

Les premiers contacts de l'Afrique Noire avec le monde occidental débutent principalement au 15e siècle avec l'exploration des côtes africaines par la flotte portugaise. Les Portugais

[4] Attaque d'une tribu par une autre, le but étant de faire des prisonniers mais aussi de procéder à des pillages.
[5]Le terme « empires soudanais » fait référence communément aux trois grands empires qu'étaient : le Ghana, le Mali et l'empire Songhaï

commenceront d'abord par installer des comptoirs sur les côtes dans un but commercial. Soucieux de préserver leurs établissements ils finissent par explorer l'arrière-pays où ils implantent des colonies. Ils furent ensuite rejoints par les Espagnols qui concentrèrent également leurs efforts sur le littoral. L'arrivée des Français et des Anglais accentue l'activité maritime et commerciale le long des côtes africaines. A partir de la première moitié du XIXe siècle, et surtout après 1880, la rivalité entre ces différents empires les entraine à pénétrer militairement toute l'Afrique et à y constituer des dominations territoriales sous formes de colonies ou de protectorats. Toutefois, l'Ethiopie, empire millénaire, et le Libéria, fondé par d'anciens esclaves affranchis, sont épargnés. La conférence de Berlin de 1885 scelle définitivement le sort du continent africain : les grandes puissances se partagent le continent et la zone d'influence de chaque empire est officiellement délimitée (Bruyas, 2008).

Dans les colonies françaises, le pouvoir était exercé par un gouverneur, chargé d'appliquer la politique coloniale. Concernant cette politique, Lanessan (1897, p.149) disait : « Dominés par l'esprit juridique romain, qui est au fond de toutes nos institutions métropolitaines, nous n'avons pas de soucis plus grand que celui de transplanter dans nos établissements coloniaux, tout l'appareil administratif et judicaire de la mère patrie (...) ». Ainsi, la politique de colonisation française diffère de celle des Britanniques. Pour la France il s'agissait avant tout de redorer son blason suite aux échecs militaires[6] de l'époque. Par contre, les motivations anglaises étaient plus commerciales : il s'agissait de trouver, d'une part, des territoires dotés de ressources naturelles et, d'autre part, des débouchés où écouler sa production. La France et la Grande Bretagne sont les principales nations coloniales et se partagent pratiquement tout le continent. Après la première guerre mondiale, les anciennes

[6] La guerre des Sept ans (1756-1763) et la bataille de Waterloo (1815).

colonies allemandes passent sous leur mandat. La Belgique, autre nation présente sur le continent africain, se focalise essentiellement sur le très riche « Congo Belge[7] ». Le Portugal, première nation à explorer le continent, reste campé sur les côtes africaines et a sous son autorité des pays essentiellement côtiers comme l'Angola, le Cap-Vert ou encore le Mozambique.

Après la seconde guerre mondiale, et suite à la forte contribution des colonies à l'effort de guerre, les politiques coloniales sont assouplies surtout dans les colonies françaises. Ces dernières ont désormais des représentants qui siègent dans les assemblées parlementaires françaises et même au sein du Gouvernement. De ce fait les lois votées à l'assemblée française s'appliquaient directement par extension aux différentes colonies. La nouvelle constitution française du 4 octobre 1958 offre aux anciennes colonies africaines hors protectorat et désormais appelées « territoires d'outre-mer », le statut de membre de « la communauté ». Cette nouvelle forme d'organisation ouvrait la voie aux indépendances.

Au moment des indépendances, les nouveaux Etats africains ont adopté pour la plupart le principe de continuité en matière juridique. Dans le cas présent, ce principe permet à une loi en vigueur au moment des indépendances de continuer à s'appliquer sauf abrogation expresse. Ainsi, dans les pays francophones, les textes juridiques issus de la colonisation française ont été « nationalisés » et appliqués par les tribunaux. Pour ce qui est des premières constitutions de ces nouveaux Etats, elles sont largement inspirées de la constitution française de 1958 : dans certains cas le texte fut repris en intégralité. Il en fut de même des conventions internationales qui ont été maintenues et appliquées en vertu du principe de continuité juridique. Dans les Etats anglophones, nous observons le même

[7] Actuelle République Démocratique du Congo (RDC)

scénario. Mieux, le Royaume Uni a pris le soin de doter ses colonies d'une constitution écrite bien avant les indépendances. Celle-ci est inspirée des institutions de l'Angleterre même si concrètement cette dernière n'a pas de constitution écrite. Cette constitution règle toutes les questions de droit administratif, de droit financier, mais aussi de droit international privé.

Par ailleurs, de nombreux experts européens sont restés au sein des gouvernements et des institutions des nouveaux pays africains. Ils ont contribué à la formation technique des juristes et experts africains. Leur présence au sein des instances de décisions africaines a fortement influencé les nouvelles lois postcoloniales. De ce fait, certaines nouvelles lois avaient plus tendance à rapprocher le droit applicable localement avec celui en vigueur dans l'ancienne Métropole[8], notamment dans le cas des pays anglophones.

Finalement, les nouveaux Etats africains se sont dotés d'une constitution de deux manières. Dans un premier cas, les constitutions étaient déjà écrites et mis en application progressivement par la Métropole au cours de la période coloniale. Cette méthode était surtout récurrente dans les colonies Anglaises mais aussi Belges. Par exemple, des pays comme le Zaïre, le Burundi et le Rwanda reçurent leur constitution qui au fond constituent une transposition du système juridique belge. De même, la France a doté le Cameroun et le Togo de constitutions à travers des décrets et des ordonnances du gouvernement de l'époque. Dans le deuxième cas, les constitutions étaient élaborées par les nouveaux Etats eux même, sous la supervision et l'assistance technique d'experts occidentaux. Le modèle de référence demeurait la constitution de l'ancienne puissance coloniale.

[8] Le terme « Ancienne Métropole » ou tout simplement « la Métropole » est généralement utilisé dans la littérature pour désigner les anciennes puissances coloniales que sont principalement la France et la Grande Bretagne.

Au fil du temps, ces constitutions des nouveaux Etats africains ont été révisées. Ces toilettages constitutionnels furent le plus souvent consécutifs à des coups d'Etats militaires. Une autre raison provient du manque de maturité démocratique qui amène certains régimes en place à modifier les constitutions pour assurer leur pérennité au pouvoir. Toutefois, il convient aussi de souligner que souvent ces changements constitutionnels sont effectués dans un esprit de changement d'orientation civile, dans le but de s'adapter aux différentes mutations sociales, comme cela a été le cas au Sénégal après la crise de 1962.

Mais quoi qu'il en soit, ces révisions constitutionnelles ne remettent pas en cause le modèle de base initialement défini par les anciennes puissances coloniales. De ce fait les institutions et systèmes juridiques africains actuels ont toujours conservé comme socle le modèle juridique qui prévaut ou qui prévalait dans les Métropoles : ainsi les anciennes colonies françaises demeurent profondément marquées par les institutions que leurs a léguées la France, ce qui leur confèrent souvent une profonde parenté à leur système juridique (Bruyas, 2008) ; de même, en Afrique Anglophone, les organismes juridiques et législatifs reflètent les structures politiques de la Grande-Bretagne (Darbon, 2009). Parlant des pays africains, Bruyas (2008, p.41) constate : « les fondements et les notions du droit demeurent pour l'essentiel les mêmes qu'en droit français et anglais. C'est vrai pour les matières du droit public : droit constitutionnel, droit administratif, droit financier. C'est également vrai pour les matières qui sont à la frontière du droit public et du droit privé : droit du travail, droit pénal, organisation judiciaire, règles de nationalité, droit foncier ».

Les pays africains peuvent être donc être répartis en deux grands ensembles juridiques. D'une part, les pays anglophones de *common law* et, d'autre part, les pays de droit civil français. Cette séparation du continent africain et, au-delà, d'une bonne partie du monde en deux ensembles plus ou moins homogènes caractérisés chacun par le rattachement à l'une

des deux traditions juridiques a conduit à interroger l'impact de ce rattachement sur différentes dimensions de la performance économique en général ou sur certains de ses déterminants supposés dont l'architecture financière. Ainsi, une vaste littérature identifie l'origine légale des institutions comme un déterminant important du développement financier (La Porta *et al.,* 1997; La Porta *et al.,* 1998) et constitue le corpus de la théorie *law & finance*. Le point suivant présente les grandes lignes mais aussi les limites de cette théorie.

1.2.2. Origine légale des institutions et développement financier : l'approche « law & finance »

Parmi les déterminants du développement financier, l'origine légale des institutions occupe une place importante. Ainsi, le développement financier d'un pays serait conditionné par son héritage légal et la règle de droit en vigueur. C'est dans cette optique que se structure le courant de pensée *law & finance*, développé par La Porta et al. (1997,1998) travaux couramment rassemblés sous l'acronyme LLSV.

Pour définir les fondements théoriques de l'origine légale et du développement financier, nous nous appuyons ici principalement sur deux synthèses, d'une part, Vilanova (2007) et, d'autre part, Beck *et al.* (2003).

Vilanova, (2007, p.1187) résume la thèse du droit et de la finance en 4 points : « (i) la tradition juridique d'un pays influence le niveau de protection des investisseurs et la qualité du système judiciaire ; (ii) le développement financier et la dispersion de l'actionnariat sont d'autant plus élevés que les investisseurs sont fortement protégés et que la qualité d'application du droit est élevée; (iii) la tradition de *common law*, plus tournée vers la

défense des intérêts privés et plus évolutive, protège mieux les investisseurs financiers que la tradition de droit civil ; (iv) les pays de *common law* ont des marchés et des intermédiaires financiers plus développés que les pays de tradition civiliste (en particulier ceux de droit civil français) ».

Beck *et al.,* (2003) après une revue des différents travaux sur le thème du droit et de la finance, résume finalement cette théorie en deux hypothèses principales. En premier lieu, dans les pays où le système juridique accorde une très grande importance à la protection des droits de propriété privée, des droits des investisseurs et de leurs contrats, les épargnants sont plus disposés à financer les entreprises et les marchés financiers se développent plus vite. En second lieu, les différentes traditions juridiques qui ont jadis émergées en Europe et qui se sont répandues dans le monde à travers les guerres, les conquêtes, la colonisation, et l'imitation, permettent d'expliquer les écarts actuels entre les pays en matière de protection des investisseurs, d'environnement des affaires et de développement financier.

Ainsi, la tradition juridique pourrait influencer le développement financier à travers deux mécanismes principaux.

D'abord, un mécanisme politique. En effet, les pays diffèrent les uns des autres par la manière dont leur système judiciaire assure la protection de la propriété privée comparativement à la propriété publique. Ainsi, dans certains pays, l'accent est mis avant tout sur la protection des intérêts publics, tandis que dans d'autres les investisseurs sont aussi bien protégés que l'Etat. On s'attend alors à ce que ces derniers aient des systèmes financiers plus développés, vecteur *in fine* d'une croissance économique plus élevée. En effet, les investisseurs préfèrent investir dans les pays où, d'une part, ils ont l'assurance de limiter certains risques tels par exemple la nationalisation et les expropriations abusives et,

d'autre part, où les procédures de résolution de conflits ne favorisent pas seulement les intérêts de l'Etat à leur détriment. La Porta et al., (1998) expliquent que la *common law* protège mieux la propriété privée que la *civil law*, raison pour laquelle les pays de tradition anglo-saxonne ont un développement financier plus important que ceux de tradition civiliste.

Ensuite, un mécanisme d'adaptabilité. Au-delà de la protection de la propriété privée, les systèmes judiciaires des pays diffèrent également selon leur capacité à s'adapter aux besoins de la finance et de l'économie réelle. Le monde des affaires est en perpétuelle mutation. En particulier, les innovations financières nécessitent l'adaptation en continu de la réglementation. A cet effet, le droit civil est jugé rigide car la procédure de modification ou de vote d'une nouvelle loi est coûteuse en termes de temps. A l'inverse, la *common law* est plus flexible et s'adapte rapidement aux différentes innovations financières. De ce point de vue, elle est plus à même de stimuler le développement financier.

L'avantage de la *common law* par rapport au droit civil français découle du fait qu'elle instaure une qualité institutionnelle propice au développement financier (La Porta et al., 1998). Ainsi, elle favorise plus le respect de la propriété privée et la protection des investisseurs. Par ailleurs, étant axée sur le principe de la jurisprudence et de la règle du précédent par laquelle le juge dispose de pouvoirs plus élargis, elle permet d'équilibrer le fonctionnement des institutions. A l'inverse, dans les pays de tradition civiliste, les magistrats ne disposent pas nécessairement de cette flexibilité. Certes, la séparation des pouvoirs y est de rigueur, mais finalement les juges ne font qu'appliquer les lois votées par les parlementaires. Ces pays se caractérisent généralement par un Etat plus interventionniste et des services publics de moins bonne qualité (La Porta et al., 1999).

De même, La Porta et al., (1997) étudient comment la protection des investisseurs varie selon les pays et les implications sur l'accès au financement externe des entreprises. En effet, les différences de protection entre investisseurs devraient permettre d'expliquer pourquoi les entreprises sont détenues et financées différemment selon les pays. A cette fin, ils ont collectionné un ensemble de données couvrant les règles juridiques relatives au droit des investisseurs et à l'application de ces règles dans 49 pays, dont 5 pays africains[9]. Ces données couvrent par ailleurs la qualité d'application des règles juridiques de façon générale, de même que les systèmes comptables. Les droits des actionnaires et les droits des créanciers sont successivement analysés. Concernant les droits des actionnaires, les résultats montrent que les pays de *common law* fournissent la meilleure protection. Les pays de tradition civiliste française procurent la plus « mauvaise » protection, tandis que les pays germaniques et scandinaves, considérés comme des variantes civilistes, occupent une position intermédiaire. Parmi les droits des créanciers, deux sont généralement identifiés comme les plus importants : celui de rentrer en possession du collatéral en cas de défaillance du débiteur et le droit de regard dans la restructuration des entreprises. Les résultats montrent que les pays de droit civil germanique procurent la meilleure protection aux créanciers, suivi par la *common law* et enfin les pays de droit civil français. Ces différences dans la protection des investisseurs ont des conséquences sur l'accès au financement externe des entreprises. Ainsi, les entreprises exerçant dans les pays de *common law* ont une plus grande flexibilité quant à l'accès au financement externe, les marchés financiers y étant plus développés.

[9] Les 5 pays africains faisant partie de l'échantillon de La Porta et al (1997) sont : L'Afrique du Sud, l'Egypte, Le Kenya, le Nigéria et le Zimbabwe.

Dans l'ensemble, la littérature *law & finance* soutient l'idée selon laquelle la *common law* serait plus favorable au développement des marchés financiers que le droit civil car elle implique une meilleure protection des investisseurs, favorise les contrats privés, et l'accès au financement externe des entreprises (La Porta *et al.,* 1997; La Porta *et al.,* 1998 ; Beck *et al.,* 2003). Cependant, force est de constater que plusieurs pays, notamment les PVD, de tradition civiliste ont réussi à surmonter ce potentiel handicap en mettant en place un cadre institutionnel favorable aux investissements. Parallèlement, certains pays de *common law* n'ont pas réussi à capitaliser sur ce prétendu avantage. En effet, sur la période de 2004-2011, les statistiques en matière d'inclusion financière révèlent que les pays de tradition civiliste ont mieux réussi que ceux issus de la *common law* (Marcelin & Mathur, 2014). Par ailleurs, la littérature *law & finance* met l'accent principalement sur l'héritage légal. Elle a tendance à omettre les conditions dans lesquelles les contrats sont appliqués et surtout la capacité des pays à mener des réformes institutionnelles au-delà de leur héritage légal. De ce fait, les divergences en matière de développement financier et économique entre pays ne sauraient s'expliquer uniquement par l'origine légale. Ainsi, de telles divergences pourraient également être liées à la qualité des institutions de chaque pays.

1.2.3. Implication de la qualité des institutions sur l'activité bancaire

Si l'approche *law & finance* souligne l'importance de l'infrastructure juridique dans le développement des institutions financières, la distinction entre traditions de *common law* et civiliste met l'accent sur l'aspect formel des règles de droit. Si celui-ci ne peut être négligé, la capacité d'une règle de droit à effectivement structurer les choix, notamment économiques, des individus comme des entreprises, dépend également de la capacité matérielle des institutions à les appliquer. Cette logique, au moins complémentaire à

l'approche *law & finance*, a conduit à s'intéresser à la notion même de qualité des institutions. Ainsi, les travaux de North (1989 ;1990 ; 1991) posent les fondements du rôle des institutions dans la performance économique des nations. Depuis lors, la littérature s'accorde sur le fait que la qualité institutionnelle est un facteur important pour soutenir la croissance à long terme, et pourrait donc en partie expliquer les différences de développement entre pays (Hall & Jones, 1999 ; Acemoglu *et al.,* 2001 ; Davis, 2010). Si l'idée d'un lien entre performance économique, mesurée en termes de croissance ou de développement et la qualité des institutions est globalement admise, il demeure nécessaire de préciser ce que recouvre le terme. De fait, les recherches portant sur la qualité des institutions mobilisent des indicateurs de différentes natures, que nous proposons de regrouper en trois catégories.

En premier lieu, la littérature mobilise des indicateurs relatifs aux institutions politiques. Plus précisément, il s'agit d'indicateurs évaluant les conditions politiques et démocratiques d'un pays donné. Ces indicateurs prennent en compte l'état des libertés civiques, mais aussi la manière dont les gouvernements sont mis en place, supervisés et remplacés. Pour mesurer la qualité des institutions politiques deux variables principales sont le plus souvent prises en compte. Une première variable, *political rights*, qui évalue la liberté des individus à participer sans contrainte à la vie politique. Cela implique de ce fait la liberté de voter pour le parti politique souhaité, de créer ou de rejoindre des organisations politiques et de se présenter à un poste électif public. Cette variable est complétée par une seconde, *civil liberty*, beaucoup plus axée sur les libertés individuelles, à savoir la liberté d'expression, de croyance et d'association. En plus des variables relatives à la liberté politique, la qualité des institutions politiques est également mesurée dans la littérature à travers la stabilité politique (Kaufmann *et al.,* 2010 ; Álvarez *et al.*, 2017 ; Bermpei *et al.,* 2018 ; Matemilola

et al., 2019). La stabilité politique saisit dans quelle mesure le gouvernement pourrait être éventuellement déstabilisé ou renversé par des moyens anticonstitutionnels ou violents, y compris le terrorisme. De même, la stabilité politique est souvent mise en exergue à travers la capacité du gouvernement, d'une part, à mettre en œuvre son programme et, d'autre part, à rester au pouvoir. Dans ce cas de figure, des aspects relatifs à l'unité gouvernementale, à l'appui législatif et populaire sont également pris en compte (Law *et al.,* 2017 ; Khan *et al.*, 2019 ; Ghazy Aziz, 2017). D'autres aspects de la qualité des institutions politiques concernent l'indépendance de la justice (Slesman *et al.,* 2019), la liberté de la presse (Álvarez *et al.,* 2017 ; Matemilola *et al.,* 2019), mais aussi la participation des militaires dans la vie politique, susceptible de mettre en danger les acquis démocratiques (Ghazy Aziz, 2017). Dans l'ensemble, les institutions politiques sont au cœur de la matrice institutionnelle. Ainsi, la qualité des institutions politiques est une condition préalable à la création et au bon fonctionnement de tout autre type d'institutions. La stabilité politique et l'environnement démocratique sont des conditions *sine qua non* à l'établissement d'un climat des affaires attractif pour les investisseurs.

En second lieu, la qualité institutionnelle est estimée par la capacité des pays à formuler et mettre en œuvre des politiques et règles solides notamment en matière de régulation de l'activité économique et de protection des investisseurs. Ainsi, des variables relatives à l'efficacité du gouvernement ou de l'administration sont utilisées dans la littérature (Law *et al.,* 2018 ; Law *et al.*, 2013 ; Khan *et al.*, 2019 ; Álvarez *et al.*, 2017 ; Ghazy Aziz, 2017). Ces variables prennent en compte différents facteurs tels que la qualité du service public et son indépendance vis-à-vis des pressions politiques, la qualité des politiques définies[10] de même que leur mise en œuvre, et le degré d'engagement gouvernemental envers ces

[10] Il peut s'agir par exemple de la qualité de la règlementation en place, l'efficacité dans la protection des droits des investisseurs.

politiques. De même, la capacité des pays à assurer la continuité du service public, et surtout à ne pas remettre en cause systématiquement toutes les politiques et règles déjà en vigueur en cas de changement de régime est également un marqueur de la qualité administrative. Ainsi, la protection du droit des emprunteurs et des créanciers, notamment en cas de faillite, est prise en compte dans la littérature à travers un indice sur la solidité des garanties juridiques (Gani & Clemes, 2016 ; Emenalo & Gagliardi, 2019). Par ailleurs, la qualité de la règlementation est une variable importante dans l'évaluation de la qualité des institutions d'un pays dans le sens où elle reflète la capacité du pays à formuler et mettre en œuvre des politiques favorisant le développement du secteur privé (Gani & Clemes, 2016 ; Matemilola *et al.,* 2019 ; Álvarez *et al.*, 2017). Ainsi, la règlementation a un impact sur les choix d'actifs des banques (Buch, 2003) ou encore le choix du pays où investir (Focarelli & Pozzolo, 2005 ;Tsai *et al.*, 2011).

Finalement, la littérature mobilise d'autres indicateurs relatifs à l'application matérielle des règles qui régissent les interactions économiques et sociales des individus. Ces indicateurs concernent, d'une part, le respect des lois et institutions en place et, d'autre part, tous les autres facteurs susceptibles d'impacter le climat des affaires et donc les décisions des investisseurs. Ainsi, la variable *rule of law* , mesurant la confiance et le respect des individus vis-à-vis des lois établies, est largement utilisée dans la littérature pour mesurer la qualité institutionnelle (Law *et al.,* 2018; Law *et al.,* 2013; Bermpei *et al.,* 2018; Khan *et al.,* 2019; Álvarez *et al.,* 2017). Cet indicateur prend en compte notamment le respect du droit de propriété, de la police, des tribunaux, la probabilité de crime et de violence, mais aussi l'exécution des contrats. Cependant, l'exécution des contrats est souvent considérée comme un indicateur à part entière dans la littérature (Gani & Clemes, 2016 ; Emenalo & Gagliardi, 2019). L'exécution des contrats peut être mesurée en nombre de jours. Dans ce

cas, il s'agit du nombre de jours calendaires qui s'écoulent entre le dépôt d'une plainte auprès d'un tribunal et la décision finale, et le cas échéant, le paiement. De même, l'exécution du contrat peut être estimée en termes de coûts, englobant de ce fait tous les frais engendrés jusqu'à l'obtention de l'application effective du contrat. Une autre variable majeure, qui définit la qualité des institutions, est la corruption (Law *et al.,* 2018; *Law et al.*, 2013; Bermpei *et al.*, 2018; Álvarez *et al.*, 2017; Matemilola *et al.*, 2019). Il s'agit le plus souvent de la corruption au sein des pouvoirs se matérialisant par l'exercice du pouvoir à des fins privées ou encore la monopolisation du pouvoir par les élites. Par ailleurs, les variables liées à la disponibilité des registres de crédit, au partage de l'information sur les emprunteurs, au taux de recouvrement des dettes, et à la facilité à faire des affaires sont également pris en compte dans l'évaluation de la qualité institutionnelle d'ensemble d'un pays (Bermpei *et al.*, 2018 ; Emenalo & Gagliardi, 2019 ; Ghazy Aziz, 2017).

Ces différents indicateurs ont été mobilisés à différents niveaux d'analyse empirique. Dans cette synthèse, nous organisons leur présentation autour de trois axes. En premier lieu, des travaux adoptent une approche macroéconomique en cherchant à relier des variables économiques agrégées aux différents indicateurs de qualité institutionnelle. En second lieu, d'autres travaux ont porté une attention particulière à une dimension considérée comme occupant une place centrale dans la capacité des acteurs économiques privés à mettre en œuvre leurs projets : l'application des règles de droit et plus particulièrement la capacité des cadres institutionnels, notamment judiciaires, à assurer l'exécution des contrats. Finalement, nous restreignons l'attention aux travaux se focalisant plus spécifiquement aux liens entre qualité des institutions et activités bancaires.

Law *et al.* (2013) montrent que le lien entre finance et croissance économique dépend du niveau de la qualité institutionnelle. Ainsi, une augmentation du niveau de développement

financier ne se traduit pas systématiquement par une augmentation de la croissance économique dès lors que le système bancaire fait face à la corruption, à une mauvaise application des règles contractuelles, ou à une ingérence politique susceptible de rediriger le crédit vers des activités ou secteurs peu productifs. Par conséquent, l'effet positif de l'activité bancaire sur la croissance économique est fortement dépendant de la qualité des institutions dans la mise en œuvre et l'application des différentes règles contractuelles. Ainsi, pour Law *et al.* (2013), il existe un effet de seuil dans cette relation. Pour un pays donné, pour que le développement financier ait un impact bénéfique observable sur la croissance économique, il faut d'abord que le pays atteigne un certain seuil de qualité institutionnelle. En dessous de ce seuil, la finance n'a aucun impact sur la croissance économique. Slesman *et al.* (2019) confirme ce résultat en montrant que dans les PVD, un seuil minimal de la qualité des institutions politiques est nécessaire. Ces résultats supportent donc l'idée selon laquelle la relation entre développement financier et croissance économique est avant tout tributaire de la qualité de l'environnement institutionnel en place. Par ailleurs, la crise financière de 2007-2008 a démontré que la finance pouvait aussi être néfaste pour l'économie dans son ensemble, lorsque les institutions échouent à jouer leur rôle de régulateur, ou lorsque les acteurs du marché profitent des failles institutionnelles (Law & Singh, 2014). Cette crise laisse penser qu'au-delà de l'objectif ultime d'atteindre un certain niveau de développement financier, il est surtout préférable d'avoir un système financier enraciné dans un cadre institutionnel solide où les règles régulant le marché sont appliquées de manière efficace. Demetriades & Law (2006), à la veille de la crise financière, abondaient déjà dans ce sens en démontrant que l'activité bancaire a des effets plus importants sur la croissance économique quand le système financier évolue dans un cadre institutionnel solide. De même, dans les PVD où la qualité institutionnelle est plus faible, les effets bénéfiques du développement financier sur la

croissance économique sont difficilement observables. En somme, un cadre institutionnel de bonne qualité est indispensable à l'économie car permettant de faire face en amont aux potentiels dérapages des acteurs du secteur financier, et *in fine* de préserver et canaliser les effets bénéfiques de la finance sur la croissance.

La qualité institutionnelle joue également un rôle central dans les décisions d'investissement des agents économiques. Álvarez *et al*. (2017) soulignent que la qualité des institutions a un impact sur le commerce international. Ainsi, les investisseurs devraient privilégier les liens commerciaux avec les pays disposant des meilleures institutions dans le sens où cela permet de bénéficier d'un cadre institutionnel efficace, flexible en ce qui concerne les contrats privés et rapide dans l'exécution et la résolution des contrats. Ghazy Aziz (2017) abonde dans le même sens en démontrant l'impact positif de la qualité institutionnelle sur les Investissements Directs Etrangers (IDE) dans les pays arabes. Les variables telles que la liberté économique, la facilité d'entreprendre et le risque pays augmentent les IDE dans les pays où elles sont de bonne qualité. Dans le secteur financier, Gani & Clemes (2016) montrent que la solidité du système juridique a une incidence sur le commerce international des services d'assurance et autres services financiers. Dans l'ensemble, de nombreux travaux mettent en lumière de quelle manière le cadre institutionnel peut renforcer les exportations des entreprises (Ma *et al.,* 2009), ou à l'inverse réduire le volume des échanges (Ranjan & Lee, 2007). Ainsi, dans les PVD, Francois & Manchin, (2013) estiment qu'en raison de la faible qualité des institutions, mais aussi des infrastructures, le volume des échanges est de 75% inférieur à celui des pays à revenus élevés.

Au-delà de l'organisation formelle des institutions, la qualité de l'application des règles contractuelles existantes est elle aussi déterminante. En effet, les institutions peuvent être

théoriquement et conceptuellement fortes, mais pour qu'elles soient utiles et efficaces, les règles caractérisant les contrats entre agents économiques doivent en pratique s'appliquer de manière transparente mais aussi flexible. Le plus important est donc la capacité des pays à garantir dans la pratique une bonne exécution des contrats, plutôt que l'existence de règles et mécanismes formels d'exécution. Dans les PVD, et notamment les pays africains, l'application des règles contractuelles reste un challenge car ces pays sont souvent confrontés à un taux élevé de corruption, mais aussi à la lenteur du système judiciaire dans la résolution des conflits issus de l'exécution des contrats. Les défaillances dans l'application des contrats ont des conséquences aussi bien sur le système bancaire que sur l'économie dans son ensemble. Une des conséquences est l'impact sur l'investissement. Ma *et al.* (2009) montrent les effets positifs d'un système judiciaire efficace, favorisant le respect des règles contractuelles, sur les exportations des entreprises. Dans le secteur financier, les résultats de Gani & Clemes (2016) soulignent qu'une amélioration de la règle de droit, mais aussi des mécanismes régissant l'application des contrats, est de nature à augmenter le commerce international des services d'assurance et autres services financiers, surtout dans les PVD. Dans les pays où le respect des obligations contractuelles est problématique, les investisseurs sont confrontés à une incertitude élevée, ce qui influence leur décision d'investir, allant jusqu'à l'abandon du projet (Clague *et al.,* 1999 ; Clarke, 2001). De même, les nombreux conflits commerciaux consécutifs à la faiblesse dans l'application des contrats conduisent souvent à une réduction des échanges particulièrement dans le cadre du commerce international, entrainant de ce fait un coût d'opportunité (Ranjan & Lee, 2007). Chemin (2006) examine l'impact du système judiciaire sur le comportement des entreprises à conclure des contrats. Les résultats montrent que l'attitude des entreprises en termes d'investissement est fortement influencée par la manière dont les contrats sont exécutés. En effet, les réformes portant sur le système judiciaire ont un impact

positif sur les décisions d'investissement. Plus précisément, les décisions d'investissement sont favorisées notamment par un nombre moins élevé de violation des règles contractuelles et un système judiciaire plus rapide dans la résolution et l'application des contrats. Acemoglu & Johnson (2005), dans une étude sur les anciennes colonies européennes, soulignent l'impact positif sur l'intermédiation financière de la flexibilité des institutions qui régissent les contrats privés. Les pays ayant de bonnes pratiques en termes de respect des règles contractuelles bénéficient d'une meilleure allocation du capital car les décisions d'investissement sont exemptes de corruption et les fonds dirigés rationnellement vers des secteurs à fort potentiel économique (Pang & Wu, 2009).

Les difficultés dans l'application des contrats sont souvent concomitantes aux défaillances du système judicaire limitant les moyens d'actions des juges en matière de résolution des conflits (Acemoglu *et al.,* 2005) et freinant l'entrepreneuriat du fait des lenteurs dans la résolution des différends commerciaux (Djankov *et al.,* 2007). Les pays, en particulier ceux en voie de développement, se doivent d'accorder une attention particulière à cette question du respect des obligations contractuelles car elle est au centre de tous les enjeux économiques. Les économies dotées de systèmes judiciaires plus efficaces, dans lesquels les tribunaux peuvent faire respecter en toute transparence les obligations contractuelles, ont des marchés du crédit plus développés et un niveau de développement global plus élevé (Dam, 2006). Cela s'explique par le fait qu'en mettant en place un système judiciaire juste et transparent, ces pays réussissent à créer un climat des affaires digne de confiance, porteur d'innovation et donc attractif pour les investisseurs. Dans l'ensemble, l'efficacité des tribunaux en matière d'exécution des obligations contractuelles est hétérogène dans les pays africains. D'une part, le Rwanda est désormais cité comme un exemple de réussite en matière de réformes sur le climat des affaires avec un temps d'attente moyen de moins de

10 mois pour la résolution d'un litige contractuel par les tribunaux, contre presque 4 ans pour des pays comme l'Inde ou encore le Bengladesh. D'autres part, au Burkina Faso et au Zimbabwe, le coût des démarches judicaires liées aux différends contractuels représente plus de 80% de la valeur du contrat disputé, contre moins de 10% dans des pays comme le Luxembourg, la Norvège ou encore l'Islande (World Bank, 2019).

Au-delà de l'activité économique dans son ensemble, des travaux se sont plus spécifiquement focalisés sur l'impact de la qualité institutionnelle sur différents aspects de l'activité bancaire. En premier lieu, la qualité institutionnelle est de nature à conditionner globalement l'offre de crédit aux agents non financiers. Certains peuvent être totalement rationnés et d'autres partiellement. Dans ce dernier cas, on s'attend à observer une relation positive entre levier financier et qualité des institutions. Ainsi, Matemilola *et al.,* (2019) étudient l'impact de la qualité institutionnelle sur la structure financière des entreprises dans les PVD. Les résultats soulignent l'importance de la qualité du cadre institutionnel dans la capacité des entreprises à obtenir un financement externe des banques. Ainsi la défaillance du cadre institutionnel constitue souvent un frein à l'obtention d'emprunt par les entreprises dans les PVD. Les carences dans la protection des créanciers et l'exécution des contrats entrainent une réticence des banques à prêter, privant ainsi les entreprises de financement (Qian & Strahan, 2007).

En second lieu, des indicateurs plus spécifiques de l'activité bancaire sont également employés afin de caractériser plus en avant l'impact des institutions sur l'activité bancaire et plus spécifiquement les caractéristiques des opérations de crédit. Ainsi, le coût ou encore la maturité du crédit ont été étudiés. La qualité institutionnelle a une incidence sur le coût

de financement des entreprises et les marges nettes des banques. En effet, le coût de financement est plus élevé dans les pays où le système judiciaire est inefficace et où la séparation des pouvoirs n'est pas acquise : c'est généralement le cas dans les PVD. Laeven & Majnoni (2005) montrent que l'inefficience du système judiciaire, notamment dans l'exécution des contrats de dettes, conduit à une augmentation des coûts d'intermédiation financière pour les entreprises et les ménages. En termes de rentabilité, les banques dans les PVD sont plus profitables que leurs homologues dans les pays développés. Parallèlement, une meilleure application des obligations contractuelles, une plus grande efficacité dans le système judiciaire et une absence de corruption sont associées à des marges nettes d'intérêts moins élevées (Demirguc-Kunt & Huizinga, 1999). Ainsi dans les pays où la qualité institutionnelle est meilleure, les marges nettes d'intérêts devraient être plus faibles. De ce fait, les marges nettes d'intérêts élevés dans les PVD, notamment africains (Honohan & Beck, 2007), permettent de mettre en exergue les contraintes institutionnelles rencontrées par les banques de ces pays dans l'exercice de leur fonction d'intermédiation.

La structure d'échéance des contrats financiers est également affectée par la qualité du cadre institutionnel. Qian & Strahan (2007) étudient de quelle manière les lois et les institutions conditionnement les contrats financiers, particulièrement les prêts bancaires. Leurs résultats montrent que dans les pays ayant des institutions fortes et de qualité en matière de protection du droit des créanciers, en plus du faible coût, les prêts ont généralement une maturité plus longue. Ainsi, dans les pays du Moyen-Orient et d'Afrique du Nord, les banques ont tendance à s'engager sur des prêts aux entreprises à long terme uniquement en présence d'un cadre institutionnel de bonne qualité (Awartani *et al.,* 2016). Plus spécifiquement, une meilleure protection des créanciers, un cadre règlementaire

efficace et une règle de droit forte sont associées à un recours accru à l'emprunt à long terme.

En outre, certains mécanismes ont plus particulièrement été étudiés dans leur capacité à déterminer le niveau et les formes de l'activité bancaire, au premier rang desquels la régulation bancaire. Ainsi, Bermpei *et al.* (2018) analysent les effets de la réglementation bancaire sur la stabilité de l'économie en tenant compte de la qualité institutionnelle. Les résultats montrent que la stabilité politique et la lutte contre la corruption consolident les effets positifs de la réglementation bancaire sur la stabilité. Par contre, en présence d'institutions fortes relatives aux droits des créanciers et à la règle de droit, ces effets positifs ont tendance à s'estomper suggérant ainsi un effet de substitution. Barajas *et al.* (2013) montrent que si un bon fonctionnement des institutions de régulation bancaires n'a pas d'effet systématique sur la production de crédit (mesurée par la profondeur financière), un mauvais fonctionnement réduit la production de crédit et, en définitive, la croissance.

De par les asymétries informationnelles pouvant exister entre banques et emprunteurs potentiels dans des économies où la production d'information fiable est un enjeu, une attention particulière a été portée aux institutions permettant la production et la diffusion d'information. Plus particulièrement, des registres d'informations sont de nature à déterminer le comportement des banques en matière d'intermédiation financière, surtout dans les PVD. Dans ces registres sont répertoriés les antécédents des emprunteurs tels les retards de paiement, les défauts de paiement, la régularité dans le paiement, l'encours de la dette (Miller, 2000). Dans les économies émergentes, les banques sont confrontées au problème d'accès à l'information sur les emprunteurs du fait des déficiences, voire de l'absence de registres de partage d'information sur le crédit. Or, l'introduction de registres de crédit augmente significativement à la fois le remboursement des prêts, mais aussi le

volume de crédit accordé par les banques (Brown & Zehnder, 2006). Djankov *et al.* (2007) confirment ce résultat en montrant que les banques sont plus disposées à prêter dans les pays ayant des institutions solides en termes de partage d'informations sur le crédit. De même, dans les pays africains, le partage d'information sur le crédit réduit le risque de crédit (Kusi *et al.*, 2017) et augmente l'offre de crédit (Fosu, 2014). Ces déficiences dans la collecte d'information se matérialisent par des coûts de transactions et d'asymétries d'informations élevés, contraignant ainsi fortement l'activité des banques. De ce fait, dans les pays disposant d'informations de qualité sur le profil des emprunteurs, les banques ont tendance à augmenter leur offre de crédit car elles bénéficient notamment d'une réduction du coût de sélection des emprunteurs à l'entrée du marché de crédit (Djankov *et al.*, 2007 ; Pagano & Jappelli, 1993 ; Kallberg & Udell, 2003). Inversement, l'expansion du crédit peut être freinée dans les pays ne disposant pas d'institutions de qualité relatives à l'information sur les emprunteurs (Marcelin & Mathur, 2014). Au-delà du cas particulier du registre de crédit, un cadre institutionnel de bonne qualité, notamment en termes de stabilité politique et de contrôle de la corruption, est de nature à réduire la sélection adverse et l'aléa moral des emprunteurs, à améliorer les conditions de prêts et par conséquent garantir le remboursement (Bae & Goyal, 2009 ; Houston *et al.,* 2010 ; Schiantarelli *et al.,* 2016).

1.3. Les banques africaines face aux contraintes institutionnelles

Nous avons vu dans la section 1.2 de ce chapitre que le contexte institutionnel est de nature à déterminer la capacité des institutions financières à opérer, c'est-à-dire à produire du crédit et des services financiers pour l'ensemble des agents non-financiers. Ainsi, les banques africaines font face à différentes contraintes liées à leur environnement économique, institutionnel et juridique susceptibles de contraindre la nature, l'ampleur et la performance de leurs activités. Une meilleure compréhension de ces contraintes et de leurs effets sur les activités bancaires doit permettre de mieux appréhender les spécificités des banques opérant dans ces pays, de mieux cerner les leviers d'action les plus susceptibles de desserrer ces contraintes, mais également de préciser les conditions de la rentabilité et de la stabilité des activités bancaires dans ces pays. Cette thèse articulée autour de trois essais empiriques vise donc, d'une part, à identifier et analyser la manière dont les contraintes institutionnelles déterminent les conditions d'exercices des banques africaines et, d'autre part, leurs conséquences sur les choix d'activités de ces banques.

Dans le premier essai (chapitre 2), en utilisant la technique de l'efficience bancaire, nous montrons de quelle manière le cadre institutionnel détermine la capacité des banques africaines à assurer leur fonction d'intermédiation financière. En effet, les banques fournissent de la liquidité aux agents économiques à travers la transformation des dépôts en prêts (Berger & Bouwman, 2009), s'exposant ainsi à un risque de liquidité. Cependant, comme évoqué dans la section 1.1 de ce chapitre, la capacité des banques africaines à financer les entreprises et les ménages est contrainte dans la mesure où la profondeur et l'inclusion financière sont faibles sur le continent. Plus précisément, l'aptitude des banques

à assumer leur fonction d'intermédiaire financier est fonction du cadre institutionnel dans lequel elles opèrent. Ainsi, les facteurs institutionnels relatifs à la règle de droit et à la qualité de la règlementation déterminent les conditions d'exercices des banques.

De nombreux travaux se sont penchés sur l'efficience bancaire et ses déterminants au niveau régional (Maudos *et al.*, 2002; Chen, 2009; Thi My Phan *et al.*, 2016; Al-Gasaymeh, 2016). Cependant, en regroupant les banques au niveau régional, ces travaux font l'hypothèse implicite que la technologie bancaire et l'environnement dans lequel évoluent les banques sont homogènes à travers les pays. Toutefois, les banques dans différents pays ou régions évoluent nécessairement dans des cadres institutionnels différents. Dans ce contexte, toute comparaison serait biaisée sans prise en compte de l'environnement spécifique du pays dans lequel chaque banque opère. Nous appliquons cette approche aux banques de l'Union Economique et Monétaire Ouest Africaine (UEMOA) et celles de la Communauté Economique et Monétaire de l'Afrique Centrale (CEMAC). En effet, les conditions institutionnelles qui déterminent l'activité des banques pourraient être également dues aux politiques d'intégration menées au niveau régional. Considérant l'Afrique Sub-Saharienne, la région est notamment structurée autour de deux unions économiques et monétaires sous-régionales : l'UEMOA et la CEMAC. En tenant compte des différences institutionnelles, nous isolons l'inefficience due à la technologie bancaire, permettant ainsi une comparaison appropriée entre banques opérant dans des environnements différents. Par ailleurs, en se focalisant sur l'impact du cadre institutionnel dans cette comparaison, cet essai s'aligne sur la littérature discutée dans la section 1.2 de ce chapitre mettant en exergue de quelle manière les écarts entre pays en termes de performance économique, mais aussi en termes de performance des institutions financières, sont conditionnés par la qualité institutionnelle. A notre connaissance, cet article est le

premier qui met en exergue l'impact du cadre institutionnel dans la détermination de la fonction d'intermédiation des banques africaines.

Dans cet essai, nous mettons l'accent sur la fonction d'intermédiation des banques, en faisant l'hypothèse que les banques produisent un seul output, à savoir les prêts, en utilisant les dépôts, le travail et le capital comme ressources, et conditionnellement au cadre institutionnel du pays dans lequel elles évoluent. En effet, comme développé dans la section 1.1 du chapitre, les pays africains sont caractérisés par une faible intermédiation bancaire et une contrainte de financement des entreprises malgré la prédominance des banques commerciales et la situation de surliquidité de ces banques. Dans ce contexte, il est important d'examiner la production de crédit dans ces pays, et plus précisément la capacité technique des banques à transformer les dépôts collectés en prêts. Les différences institutionnelles entre pays de l'UEMOA et de la CEMAC sont prises en compte à travers trois variables principales mesurées au niveau pays : une première variable relative à la protection du droit des emprunteurs et des créanciers (*Strength of Legal Right Index) ;* une deuxième liée à l'environnement contractuel de ces pays, (*Enforcement of Contracts Index) ;* et enfin une dernière variable tenant compte de la qualité de la réglementation *(Regulatory Quality).* Nous contrôlons également pour les conditions macroéconomiques.

Afin d'identifier l'impact de l'environnement institutionnel sur l'activité d'intermédiation, nous nous appuyons sur les méthodes fondées sur l'économie de la production et plus spécifiquement sur les techniques d'efficience aujourd'hui couramment utilisées dans l'analyse de la performance sectorielle, notamment bancaire. Nous procédons alors en deux temps. Dans un premier temps, une fonction de production est estimée en supposant que la capacité technique des banques à produire du crédit est déterminée uniquement par la technologie bancaire. De ce fait nous faisons l'hypothèse implicite que l'environnement

institutionnel dans lequel évoluent les banques ne joue aucun rôle dans leur fonction d'intermédiation. Dans un second temps, les variables liées au contexte institutionnel sont prises en compte dans l'estimation de la frontière de production. Ainsi, la comparaison des deux niveaux d'efficience associés à chaque étape permet de mettre en exergue le rôle joué par le cadre institutionnel dans la détermination de la capacité technique des banques de l'UEMOA et de la CEMAC à produire du crédit. En termes d'approche économétrique, nous estimons une fonction de production stochastique trans-log (Christensen *et al.*, 1973).

Les résultats montrent que le cadre institutionnel joue un rôle déterminant dans la fonction d'intermédiation des banques. En effet, abstraction faite de l'environnement institutionnel, les scores d'efficience technique estimés sont hétérogènes à travers les pays, et les deux zones économiques que sont l'UEMOA et la CEMAC. En revanche, lorsque le modèle tient compte de l'environnement institutionnel spécifique de chaque pays, les différences initialement observées disparaissent, rendant ainsi les deux zones économiques et monétaires statistiquement indiscernables. Ces résultats suggèrent que les différences apparentes d'efficience technique sont liées aux conditions institutionnelles et économiques auxquelles sont confrontées les banques plutôt qu'à des spécificités relatives à des choix managériaux ou stratégiques. Par ailleurs, nos résultats mettent également en lumière les différences dans les niveaux d'intégration économique et financière entre l'UEMOA et la CEMAC. En effet, nous observons que les pays de l'UEMOA sont pour la plupart homogènes, tandis que ceux de la CEMAC sont plus hétérogènes. Ainsi, l'essai fournit une approche originale pour évaluer le niveau d'intégration financière entre les deux zones. Dans l'ensemble, la qualité des institutions mais aussi les conditions macroéconomiques déterminent la capacité des banques d'Afrique Sub-Saharienne à produire du crédit. En effet, une meilleure protection du droit des emprunteurs et des

créanciers, un environnement garantissant une bonne application des contrats et un revenu par habitant élevé sont associés à une augmentation significative du niveau d'efficience technique des banques. Inversement, une bonne qualité de la réglementation et un niveau de développement élevé sont associés à une augmentation moindre du score d'efficience. Ces résultats suggèrent ainsi que les reformes portant sur la protection du droit des emprunteurs et des créanciers, l'instauration d'un cadre institutionnel propice au respect des règles contractuelles devraient être prioritaires en vue d'augmenter la capacité des banques à produire du crédit.

Les résultats du premier essai (chapitre 2) montrent que les banques africaines sont donc contraintes institutionnellement dans leur fonction d'intermédiation financière. L'une des conséquences de ces contraintes est la forte détention de liquidité par les banques du continent (Carpio & Honohan, 1993 ; Freedman & Click, 2006 ; Saxegaard, 2006). Parallèlement, les agents non-financiers peinent à accéder au crédit. Dans le deuxième essai (chapitre 3), nous analysons les déterminants de cette détention apparemment paradoxale. En effet, sur la période 2001 à 2016, le ratio moyen des réserves liquides rapportées aux actifs bancaires variait entre 20% et 30%[11]. A titre de comparaison, sur la même période, la moyenne mondiale de ce ratio se situait entre 15% et 20%. De plus, la différence est significative entre les pays développés et ceux de l'ASS. Ainsi, pour les USA, le ratio des réserves liquides en pourcentage des actifs bancaires est resté autour de 1% pendant une longue période avant une augmentation significative lors de la crise financière de 2007. Pendant ce temps, les fonds liquides rapportés aux passifs étaient de 62.1% au Ghana,

[11] Estimation des auteurs sur des données issues de la Banque Mondiale.

tandis qu'en République Démocratique du Congo ce ratio atteignait un pic de 76.5% (European Investment Bank, 2013). Ces niveaux élevés de liquidité thésaurisée pourraient être préjudiciables à l'économie des pays africains, et cela pour deux raisons. En effet, comme présenté dans la première section de ce chapitre, les secteurs financiers de ces pays sont, d'une part, dominés par les banques (*bank-based*) et, d'autre part, sous-développés. La faiblesse structurelle des systèmes bancaires associée à la thésaurisation de réserves et autres actifs liquides peuvent accentuer les difficultés rencontrées par les entrepreneurs et les petites entreprises à accéder au crédit, car les banques pourraient être plus disposées à ne prêter qu'aux grandes entreprises (Demirgüç-Kunt & Klapper, 2012). Par ailleurs, la thésaurisation de réserves excédentaires pourrait représenter un coût d'opportunité pour les banques car elles détiennent des actifs à faible rendement qu'elles pourraient potentiellement investir dans des activités de prêts à rendement plus élevé. En effet, alors que les banques africaines détiennent des réserves excédentaires, elles sont pourtant réticentes à prêter. Dans ce contexte d'accès potentiellement contraint au crédit bancaire, la thésaurisation de réserves par les banques commerciales est dans une certaine mesure paradoxale.

Au regard de la littérature, deux approches permettent d'expliquer la thésaurisation de réserves par les banques. Traditionnellement, les banques détiennent des réserves liquides dans le but de se prémunir contre le risque de liquidité relatif à la production de prêts illiquides. Ce motif de précaution s'inscrit dans la théorie moderne de l'intermédiation financière (Bryant, 1980; Diamond & Dybvig, 1983 ; Diamond & Rajan, 2001). En effet, les banques font face à un risque de liquidité car leur rôle principal est de produire des prêts illiquides, tout en fournissant de la liquidité à la demande aux déposants (Berger & Bouwman, 2009). Ainsi, elles détiennent des actifs liquides en vue de faire face aux retraits

potentiels. Cependant, les banques pourraient également détenir des réserves de manière involontaire en raison du déséquilibre entre l'offre et la demande sur le marché du crédit, et plus précisément lorsque la demande du crédit est inférieure à l'offre. Cette situation est susceptible de résulter de chocs conjoncturels conduisant à un « *credit crunch* ». Cependant, elle peut également être de nature structurelle, traduisant un déséquilibre durable sur le marché du crédit. En effet, les déficiences dans le processus de prêts, l'incapacité des agents non-financiers à produire le collatéral requis, l'incapacité des banques à gérer les asymétries d'informations et le manque de projets identifiés comme viables, peuvent conduire les banques à réduire leur offre de crédit, indépendamment des ressources disponibles pour l'intermédiation.

Dans la littérature, ces deux approches de la thésaurisation sont généralement étudiées séparément. Dans ce deuxième essai, nous proposons une compréhension globale du phénomène de thésaurisation des réserves dans les PVD, en considérant simultanément les deux approches pour expliquer l'accumulation de réserves par les banques commerciales d'ASS. A cet effet, la mise en perspective de potentielles situations de déséquilibre sur le marché de crédit, nécessite d'abord l'estimation d'un indicateur caractérisant la direction mais aussi le degré de tels déséquilibres. Cet indicateur est estimé en suivant le cadre théorique du déséquilibre du marché de crédit, proposé notamment par Maddala & Nelson (1974). Nous adaptons ce cadre théorique à la structure particulière des économies africaines. En effet, les économies africaines sont particulièrement connues comme spécialisées dans l'exportation de produits miniers et agricoles et l'importation de produits finis. Cette dimension est prise en compte par l'introduction de variables relatives aux matières premières, aux produits agricoles et plus généralement à l'importation et à l'exportation. De même, Djankov *et al.* (2007) mettent en avant le fait que les

caractéristiques intrinsèques des pays telles que l'origine légale et plus particulièrement les droits des créanciers et le partage de l'information sur le profil des emprunteurs peuvent jouer un rôle déterminant dans l'offre et la demande de crédit. Nous prenons en compte cet aspect à travers des effets fixes pays dans les régressions, permettant ainsi de contrôler les spécificités entre pays. Ensuite, l'exposition des banques au risque de liquidité est prise en compte à travers un indicateur de volatilité des dépôts, construit en suivant Nketcha Nana & Samson (2014). Enfin, en utilisant l'indicateur de déséquilibre du marché de crédit, et le risque de liquidité, nous expliquons la thésaurisation de réserves par les banques commerciales d'ASS. Dans ce sens, deux indicateurs des réserves sont utilisés. D'abord le ratio des réserves rapportées au dépôts. Ce premier indicateur reflète la définition traditionnelle des réserves à savoir les créances des banques commerciales sur la banque centrale. Ces créances comprennent ainsi le cash détenu à la banque centrale, les titres de créances souscrits auprès de la banque centrale et toutes les autres créances sur la banque centrale. Cependant, les banques peuvent également décider d'investir une partie de leurs réserves dans d'autres actifs liquides, notamment des titres souverains à court terme. Cette caractéristique est ainsi prise en compte en élargissant notre définition des réserves, et plus précisément en y rajoutant les créances sur l'Etat mais aussi les créances sur les non-résidents. Ces actifs liquides sont ensuite rapportés aux actifs bancaires.

Nos premiers résultats montrent que la plupart du temps et dans la plupart des pays, l'offre potentielle de crédit est supérieure à la demande. Cette caractéristique que nous interprétons comme le reflet des contraintes spécifiques pesant sur le marché de crédit des pays d'ASS, pourrait déterminer la manière dont les banques gèrent la liquidité. En effet, nos résultats montrent ensuite que les banques faisant face à une demande insuffisante de crédit détiennent plus de réserves sous forme de cash, mais ne détiennent pas nécessairement plus

d'actifs liquides. Inversement, les banques opérant dans des conditions d'excès potentielle de demande détiennent moins d'actifs liquides, mais ne détiennent pas nécessairement en moyenne moins de réserves en cash. Cela suggère que les banques d'ASS confrontées à une demande inférieure de crédit accumulent des réserves sous forme de cash, mais en moyenne n'investissent pas systématiquement cet excès de liquidité dans d'autres actifs liquides. En revanche, lorsque la demande potentielle de crédit est plus élevée, les banques réallouent la liquidité aux agents non-financiers en se servant des actifs liquides au lieu des réserves détenues sous forme cash. Cela pourrait refléter une gestion de la liquidité de type *pecking-order* où pour répondre à la demande de crédit, les banques préfèrent d'abord liquider les actifs liquides détenus (non-cash), tout en gardant à l'esprit que les situations d'excès d'offre de crédit sont la norme. Et inversement, elles pourraient être réticentes à utiliser les réserves sous forme de cash pour produire du crédit supplémentaire, pour des raisons toujours liées à la gestion de la liquidité. Ainsi, ces résultats mettent en évidence une asymétrie dans la gestion de liquidité des banques africaines reflétant les ajustements opérés par ces banques dans leur bilan au gré des fluctuations de la demande de crédit. Par ailleurs, la détention d'actifs liquides est liée à la propension à observer des épisodes de retraits répétés. Par conséquent, en moyenne, les banques d'ASS n'ajustent pas leurs réserves et actifs liquides aux fluctuations courantes de dépôts. Néanmoins, elles tiennent compte dans la détermination de leur niveau d'actifs liquides (non-cash) des fluctuations cumulées potentiellement plus importantes.

Dans l'ensemble, une partie des niveaux élevés de réserves thésaurisées par les banques africaines est le résultat d'une faiblesse structurelle de la demande de crédit qui pourrait être liée aux dysfonctionnements du marché. De plus, nos résultats ne font pas apparaître d'association entre la thésaurisation de réserves et le risque de liquidité, mesuré par la

volatilité des dépôts. Toutefois, les banques d'ASS gèrent leur position globale de liquidité en ajustant leurs actifs liquides (non-cash) pour produire du crédit. Nos résultats suggèrent que les politiques susceptibles d'accroitre la profondeur des marchés de crédit devraient prioritairement être axées sur les contraintes structurelles qui limitent la capacité des agents non-financiers à accéder au marché du crédit. Ainsi, la mise en place d'un meilleur cadre de gestion des risques, de même que l'assouplissement des conditions d'accès au marché du crédit devraient permettre aux banques de réinjecter les réserves dans l'économie réelle, et par conséquent contribuer à l'émergence d'un secteur privé pérenne. De telles politiques pourraient consister en la mise en place de registres d'information sur le crédit, une amélioration de la gestion du collatéral à travers par exemple le développement de systèmes de garantie bénéficiant d'un soutien public. A l'inverse, des mesures visant à réduire l'exposition au risque de liquidité, telle que la diffusion de l'assurance des dépôts, ne sont pas suffisantes pour complètement endiguer l'ampleur de cette thésaurisation. Nos résultats pourraient également suggérer que les banques ne sont pas les mieux armées pour financer certains segments de l'économie. Cela pourrait alors expliquer l'expansion des institutions de microfinance au cours des 2 à 3 dernières décennies. Ainsi, la structure des bilans des banques d'Afrique sub-saharienne reflète à nouveau les contraintes dans lesquelles elles opèrent. Dans un contexte où les banques ne sont en mesure de répondre qu'à une part limitée des besoins de financement, l'existence de déficiences sur le marché de crédit peut dans une certaine mesure remettre en question le business model des banques commerciales africaines et avoir des conséquences sur leur rentabilité mais aussi leur stabilité. Le dernier essai (chapitre 4) s'inscrit dans cette thématique.

On l'a vu, les banques africaines sont contraintes dans leur capacité à produire du crédit. On peut donc s'attendre à ce que, toutes choses égales par ailleurs, l'activité de crédit représente une moindre part au bilan des banques africaines comparativement à d'autres zones géographiques. De fait, il ressort des données bilancielles que les banques africaines présentent effectivement une part moindre du crédit à l'actif. Simultanément, la part des marges d'intermédiation dans les revenus d'exploitation des banques africaines est relativement plus faible comparativement au reste du monde. Cela conduit à s'interroger quant à la structure des revenus des banques africaines et ses liens avec leur rentabilité et leur stabilité. En effet, la question de la structure des revenus bancaires a principalement été abordée par le biais de la diversification des sources de revenus. Ainsi, des banques traditionnellement axées sur la production de crédit cherchent à diversifier leurs revenus en développant, par exemple, les services financiers ou encore les activités de trading. Toutefois du fait des contraintes discutées dans la littérature, et plus spécifiquement mises en évidence au chapitre 3, pesant sur la capacité des banques africaines à produire du crédit et générer des revenus d'intermédiation, on peut s'interroger sur la pertinence de ce schéma pour les banques africaines. Ainsi, la part importante observée des autres sources de revenus est plus susceptible de résulter d'une sous-représentation des marges d'intérêt, reflet de la faible production de crédit, que de découler d'une surreprésentation des autres activités bancaires, résultant d'une stratégie explicite de diversification par rapport au modèle traditionnel d'intermédiation. S'il n'est pas en l'état possible de trancher directement entre ces deux explications, il demeure intéressant de caractériser plus avant le lien entre structure des revenus, profitabilité et stabilité. En effet, l'exercice d'activités autres que l'intermédiation nécessite des ressources organisationnelles et humaines spécifiques dont ne disposent pas nécessairement toutes les banques, selon leur structure de propriété, leur ouverture internationale ou encore leur taille. Dans ce chapitre 4, nous

étudions les implications de la structure de revenus des banques africaines sur leur rentabilité et leur stabilité.

La littérature est loin d'être univoque quant à l'impact du passage de l'intermédiation financière vers des activités bancaires non-traditionnelles sur la performance ou la stabilité des banques (Gallo *et al.*,1996; Stiroh, 2004; Lepetit *et al.*, 2008a; Meslier *et al.*, 2014; Saghi-Zedek, 2016). De plus, peu d'études ont examiné l'impact de la diversification de revenus sur l'intermédiation financière et plus précisément sur les marges nettes d'intérêts. Dans cet essai, en définissant la structure des revenus comme reflétant le business model des banques (Köhler, 2015), nous examinons les implications de la diversification des revenus sur les marges nettes d'intérêts, la performance globale ainsi que la stabilité des banques africaines. Plus spécifiquement, le business model est défini par la structure du revenu des banques et plus précisément par la part des revenus autres que d'intérêts dans le revenu total d'exploitation. Par ailleurs, en suivant la littérature (Stiroh, 2004; Lepetit *et al.*, 2008a) nous subdivisons également ce revenu en trois parties à savoir : les frais et commissions, les revenus provenant des activités de trading et les autres revenus autres que d'intérêt.

En outre, la structure de l'actionnariat peut avoir un effet modérateur sur le lien entre diversification et performance ou stabilité, du fait que l'accès aux ressources, aussi bien humaines que financières, est différent selon le type de banque. Le contexte africain est caractérisé par la coexistence de quatre types de banques en termes de propriété : les banques publiques, les banques privées locales, les banques étrangères et les banques panafricaines. En prenant donc en compte la diversité dans l'actionnariat des systèmes bancaires africains, nous étudions dans un premier temps comment le poids et la composition des activités bancaires non-traditionnelles déterminent les marges nettes

d'intérêts des banques africaines, définies comme la différence entre les intérêts créditeurs et les intérêts débiteurs, exprimée en pourcentage de l'actif productif. Ensuite, en suivant la littérature sur la diversification des revenus, nous étendons notre approche en examinant également l'impact sur la performance globale des banques mesurée par le rendement de l'actif (Stiroh & Rumble, 2006; Meslier *et al.,* 2014; Saghi-Zedek, 2016). En outre, la littérature souligne le fait que dans certains cas, les bénéfices en termes de performance liés à la diversification des revenus peuvent être éclipsés par une augmentation des risques. De ce fait, nous examinons finalement l'implication de la diversification des revenus sur la stabilité des banques africaines. La stabilité bancaire est prise en compte à travers le Z-score qui représente la distance au défaut pour une banque donnée (Stiroh, 2004; Stiroh & Rumble, 2006; Laeven & Levine, 2009; Lepetit & Strobel, 2013), mesure désormais couramment utilisée dans la littérature bancaire.

Dans l'ensemble, les résultats montrent que la diversification des revenus est associée à une baisse des marges nettes d'intérêts des banques africaines. En revanche, il n'existe pas de lien direct avec la performance globale et la stabilité. Par conséquent, nos résultats suggèrent que si les banques africaines ne bénéficient pas d'une réorientation de leur business model vers des activités bancaires non-traditionnelles, elles ne semblent pas non plus en pâtir en moyenne. La conjonction de marges nettes d'intérêts plus faibles et d'une performance globale stable va dans le sens d'une substitution stratégique entre activité d'intermédiation et développement de services financiers, observée dans d'autres régions du monde. Dans cette optique, les banques africaines s'inscrivent dans des évolutions plus globales des métiers bancaires. Cependant, les résultats mettent en évidence un effet taille, et dans une moindre mesure un effet de la structure de propriété. D'abord les petites banques subissent une baisse de performance tandis que les grandes banques gagnent en

stabilité. Ces résultats semblent suggérer que les petites banques, contrairement aux grandes, manquent d'expérience et d'expertise lorsqu'elles se tournent vers des activités bancaires non-traditionnelles. Ensuite, comparées aux banques privées locales, les banques publiques gagnent aussi bien en performance qu'en stabilité, tandis que les banques panafricaines sont plus performantes. De même, les banques bénéficiant d'un soutien en termes d'accès à des ressources financières, des compétences particulières ou encore à des marchés financiers spécialisés via des réseaux internationaux (banques étrangères et banques publiques) jouissent dans une certaine mesure des avantages liés à la diversification. Ces résultats interrogent quant à la capacité des établissements domestiques et plus petits à s'inscrire de manière pérenne dans ces évolutions globales des métiers bancaires et, dans une perspective plus large, à contribuer au développement financier de leurs économies. A terme, il pourrait en découler des mécanismes de regroupement et de consolidation de ces banques.

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Chapitre 2 - How Institutional Framework Shapes Bank Efficiency in Sub-Saharan African Countries

We investigate whether the institutional framework influences bank ability to perform intermediation in Sub-Saharan Africa (SSA). Applying the stochastic frontier approach to a sample of SSA banks, we find that differences across institutional frameworks largely explain the differences in intermediation technical efficiency observed across SSA countries or regional organizations (UEMOA and CEMAC). Overall, the strength of legal rights, the level of contract enforcement, and regulatory quality explain the observed heterogeneity. Reforms that promote the private sector and protect the rights of borrowers and lenders are essential to improving the ability of SSA banks to supply credit.

Keywords: Africa, Bank Efficiency, Financial Intermediation, Credit, Institutional Framework

JEL Classification: G00; G21; G28; G32; F36; N27

2.1. Introduction

In this paper, we focus on how the institutional framework determines the capacity of banks in Sub-Saharan Africa countries to perform bank transformation efficiently. Indeed, banks provide liquidity to economic agents by transforming deposits into loans (Berger & Bouwman, 2009), carrying the resulting liquidity risk on their balance sheet. However, the ability of banks in Sub-Saharan Africa countries to fund non-financial agents appears to be constrained. Indeed, in these countries both financial depth and financial inclusion are weak. By examining the financial development in Africa in an international comparison, Beck & Cull (2014) find that the median private credit to GDP ratio is 34% in non-African developing countries, but only 18% in Africa. Besides, only 21% of the firms have a line of credit or loan from a formal financial institution, while this indicator reaches 43% in non-African developing countries (Demirgüç-Kunt & Klapper, 2012). More specifically, the financial intermediation is limited as banks prefer to invest in government securities, instead of lending (Allen *et al.,* 2011). Thus, banks' ability to supply effectively loans to the economy is questionable. In this context, it is important on the one hand to investigate banks' efficiency to supply credit, and on the other hand the determinants of this efficiency.

The institutional framework may be fundamental in explaining bank technical efficiency in Sub-Saharan Africa countries, specifically from a regional perspective. In fact, institutional factors such as rule of law and regulatory quality determine the environment in which banks operate. By focusing on the impact of a country institutional framework, we follow the extensive literature emphasizing how the gap between countries in terms of economic performance, as well as performance of financial institutions may be explained by differences in institutions (North, 1991; Hall & Jones, 1999; Acemoglu *et al.,* 2001; Davis,

2010; Bae & Goyal, 2009; Qian & Strahan, 2007). Therefore, beyond the managerial aspect, we hypothesize that institutions are likely to shape bank technical efficiency in SSA.

In this article, we focus on the transformation function of banks by assuming that banks produce a single output, loans, using deposits, labor, and capital as inputs, conditional to the country institutional framework where banks operate. This approach allows computing technical efficiency scores that reflect how banks are able to mobilize their inputs in order to supply credit to the economy. The closest approach to our study is Dietsch & Lozano-Vivas (2000). Basically, Dietsch & Lozano-Vivas (2000), by comparing bank efficiency between France and Spain, suggest that the definition of a common frontier has to incorporate country-specific conditions. Indeed, banks within different countries or regions evolve in different environments. Thus, in some extent a cross-country comparison would be biased if the environmental conditions are not accounted for. We apply this approach on the UEMOA[12] and CEMAC[13] banks. We proceed here to a cross-regional comparison. In fact, the institutional and environmental conditions that shape the financial sector in SSA might also be determined by the integration policies pursued at the regional level. Considering SSA, the region is notably structured along two sub-regional economic and monetary unions: CEMAC and UEMOA. Thus, in addition to consider the impact of institutional and environmental conditions on the technical efficiency of SSA banks in a comparative perspective, we analyze each of the two organizations separately. Accordingly, our methodology provides an original way to characterize the integration of the banking industry in each of these zones. Moreover, by accounting for institutional differences, we isolate inefficiency due to banking technology allowing an appropriate

[12] In French, UEMOA refers to « Union Économique et Monétaire Ouest Africain »
In English, UEMOA is called 'West African Economic and Monetary Union'.
[13] In French, CEMAC refers to « Communauté Economique et Monétaire de l'Afrique Centrale ».
In English, CEMAC is called 'Central African Economic and Monetary Community'.

comparison between banks operating in different environments. Finally, our paper also provides an aggregate assessment of the impact of institutional framework on financial intermediation.

The results show that institutions matter. Indeed, when not accounting for the institutional environment, measured efficiency levels of transformation appear to be heterogeneous across countries and regions. However, when the model includes the specific institutional frameworks of each country, the observed differences mostly disappear, making especially the two monetary unions virtually undistinguishable. This suggests that apparent differences are linked to the institutional and economic conditions faced by banks rather than to specificities linked to managerial or strategic choices leading to specific business models. The results also emphasize the differences in the levels of economic and financial integration between the two organizations. In fact, countries within the UEMOA zone are mostly homogeneous, while those of CEMAC are more heterogeneous. Thus, the paper also provides an original approach to evaluate the level of financial integration in UEMOA and CEMAC. Overall, the quality of institutions but also the macroeconomic conditions determine the ability of SSA banks to produce credit. The larger the strength of a legal right index, an index for enforcement of contracts, and per capita income, the larger is the increase in efficiency. Conversely, the larger regulatory quality and financial development, the smaller is the increase in efficiency. In this context, reforms that promote the private sector and guarantee the rights of lenders and borrowers should have priority in order to increase banks technical ability to supply credit. In our knowledge, this paper is the first which brings to light the important influence of the institutional framework in determining bank ability to perform financial intermediation in SSA countries.

The remainder of the chapter is organized as follows. Section 2.2 provides the background of the research question. Section 2.3 focuses on the methodology and data. In section 2.4, the results are presented, and the section 2.5 concludes.

2.2. Background

2.2.1. Literature review

Studies about banking efficiency in Sub-Saharan Africa are few. Unlike developed countries, the first investigations in the field were conducted in the 2000s. Many of the studies were first oriented on the nexus between competition and banking efficiency (Hauner & Peiris, 2008; Mathisen & Buchs, 2005; Mlambo & Ncube, 2011). Indeed, in the 1980s and 1990s, most Sub-Saharan Africa countries have implemented policies to restructure their financial sectors. The aim was to promote the financial development and therefore boost growth and reduce poverty. These policies have been accompanied by the entry of foreign banks in many SSA countries and, therefore, an increase of competition in the banking sector.

However, a part of the literature also addresses the issue of bank efficiency and its determinants as a whole. In this context, three approaches are commonly adopted. First, we have approaches that estimate efficiency scores without any consideration of the environmental influence (Ncube, 2009; Kamau, 2011). Second, studies first determine the level of efficiency and then investigate the determinants of these efficiency levels by using some bank-specific factors and external environmental variables as explanatory variables (Kirkpatrick *et al.,* 2008; Kiyota, 2011; Kablan, 2009a; Chen, 2009). The last approach is

about studies that account for the potential impact of environment in building an efficient frontier (Kablan, 2009b). Regarding bank-specific factors, size and ownership are usually identified as having an impact on efficiency levels (Ncube, 2009; Kirkpatrick *et al.* 2008; Kamau 2011; Kiyota, 2011; Kablan, 2009a). In addition to bank specific factors, environmental variables also determine bank efficiency in SSA countries. A first set of environmental variables are macroeconomic conditions. Indeed, income, inflation, and financial depth are emphasized by the literature. Kablan (2009a), Chen (2009) and Kiyota (2011) find that higher income is associated with higher efficiency. Concerning inflation, there is a negative correlation with cost efficiency (Chen, 2009; Kiyota, 2011) and a positive relationship with profit efficiency (Kiyota, 2011). In terms of financial depth, the correlation with cost efficiency is positive (Chen, 2009), while profit efficiency is lowered by high financial development (Kiyota, 2011). Overall, a stable macroeconomic framework contributes to higher banking efficiency. Then, variables related to the legal framework and the quality of institutions are the other external factors that determine efficiency levels. Chen (2009) finds that stronger legal institutions, as well as political stability and government effectiveness, are beneficial to banking efficiency.

Among the abovementioned cross-country studies, none consider the environmental conditions in generating the efficient frontier. Most proceed in two steps: first, efficiency levels are estimated by using only banking technology, and then these scores are regressed on explanatory variables. By resorting to Battese & Coelli (1995), Kablan (2009b) addresses this gap. With this method, the impact of variables that condition cost efficiency is integrated into the cost frontier. Therefore, the obtained levels of efficiency are supposed to account for the potential influence of the environmental conditions. However, it is important to note that only two environmental variables were included: the level of income

and the percentage of the rural population. In this paper, we extend this approach by integrating other variables related to the legal framework and the quality of institutions in the efficient frontier. More specifically, unlike previous studies, our approach highlights that inefficiency in the Sub-Saharan Africa banking industry is not only related to the management but also depends on the institutional framework.

2.2.2. The UEMOA and the CEMAC: between similarities and heterogeneity

In economic and financial terms, two main zones arise in SSA: the UEMOA and the CEMAC. Indeed, these two zones are the most successful attempts of economic and monetary integration on the continent. On the one hand, countries within each zone are theoretically homogeneous due to the implementation of common policies. On the other hand, the two zones have similarities regarding their banking systems but also differences related to the macroeconomic and legal framework. Given these characteristics, the UEMOA and the CEMAC provide a framework to examine how bank transformation can be influenced by the environment in which banks operate.

Established in 1994, the West African Economic and Monetary Union (UEMOA) is made up of 8 member states: Benin, Burkina Faso, Ivory Coast, Guinea Bissau, Mali, Niger, Senegal, and Togo. These countries have a common Central Bank, the BCEAO[14], and a single currency, the *Franc CFA*. Among its objectives, the BCEAO is committed to developing and apply the common monetary policy for all the state members. It also ensures the stability of the banking and financial system of the community. The BCEAO has an

[14] BCEAO stands for « Banque Centrale des Etats de l'Afrique de l'Ouest » in French.

agreement with the *Banque de France*, which allows the *Franc CFA* exchange rate to be fixed with the euro.

The Central African Economic and Monetary Community (CEMAC) is the exact equivalent of the UEMOA, but it consists of central African countries. It was founded in 1999 and has 6 member states: Cameroon, The Central African Republic, The Republic of Congo, Gabon, Equatorial Guinea and Chad. Like the UEMOA, the CEMAC countries also have a common central bank, the BEAC[15], and a single currency, the *Franc CFA*[16], also linked to the *Banque de France* and the euro.

The UEMOA and the CEMAC have some similarities: they have similar currencies linked to the *Banque de France* and, as economic and monetary organizations, they pursue the same objectives. Moreover, the financial sectors within the CEMAC and the UEMOA have similar structures. Financial markets are underdeveloped in both zones. Moreover, their financial sectors are widely dominated by banks. Non-bank financial institutions (NBFIs) are almost non-existent. For instance, in the CEMAC, the banking system accounts for more than 80% of the financial assets. In both zones, a large part of the banking system is held by foreign investors — at least 50% of the assets (Banque Africaine de Développement [BAD], 2010; Allen *et al.*, 2011; IMF, 2016). One of the common characteristics to both zones is the concentration of the banking system. In each of the CEMAC countries, approximately 70% of the assets are held by the three largest banks. In the whole UEMOA zone, five banks account for 50% of the banking assets (Imam & Kolerus, 2013; IMF, 2016). Access to formal banking services is a hindrance in both zones. For example, on

[15] BEAC stands for 'Banque des Etats de l'Afrique Centrale' in French.
[16] Even if they have the same name, the 'Franc CFA BCEAO' and the 'Franc CFA BEAC' are different and are not interchangeable: 1 euro = 655,957 'Francs CFA BCEAO', and 1 euro = 655,957 'Francs CFA BEAC'.

average, in the CEMAC countries, less than 15% of adults are bank account holders (Beck & Cull, 2014). However, the size of the financial sector is smaller in CEMAC zone, and its depth is higher in UEMAO zone. In 2013, for CEMAC, 50 banks were registered in the 6 member states. At the same period, in UEMOA, the banking system was made up of 114 banks. The UEMOA countries have a level of financial development higher than those of CEMAC. Indeed, the ratio of credit to GDP is 10% in CEMAC countries, while in the UEMOA, this ratio reaches 20% (Imam & Kolerus, 2013; IMF, 2016). Nevertheless, the banking industries in the two zones appear to be close, which permits the assumption that the banking technology is the same in all the countries considered here, thus allowing the computation of a common production frontier and efficiency scores.

However, significant economic differences also exist between UEMOA countries and those of the CEMAC. Indeed, economic specialization is different between the two zones. In fact, among the 6 countries of CEMAC, 5 are oil producers; the Central African Republic is the exception. Oil represents 41% of the GDP of the region and 86% of the goods' exports (Fonds Monétaire International [FMI], 2012). On the other side, the UEMOA countries are predominantly exporters of agricultural products, such as cotton, coffee and cocoa. Consequently, the UEMOA countries are poorer than those of the CEMAC. With regard to the business environment, compared to CEMAC, the UEMOA offered the best environment for doing business (World Bank, 2013a). The ease of doing business is evaluated by the Distance to Frontier (DTF). According to the definition of the World Bank, 'the distance to frontier score aids in assessing the absolute level of regulatory performance and how it improves over time. This measure shows the distance of each economy to the "frontier," which represents the best performance observed on each of the indicators across all economies in the Doing Business sample since 2005.' This indicator is ranked from 0

to 100, where 0 represent the lowest performance and 100 the frontier. In 2013, on average, the DTF was 44.57 for the UEMOA countries, and 40.96 for CEMAC countries.

To summarize, on the one hand, banks in UEMOA and CEMAC may have the same technology. On the other hand, these banks operate in different environments that are likely to be shaped at the sub-regional level. In this context, to properly measure and compare their level of efficiency, we have to control for environmental factors to consider the conditions in which banks evolve.

2.3. Methodology and Data

2.3.1. Methodology

Sub-Saharan Africa has one of the most underdeveloped banking systems in the world (Honohan & Beck, 2007; Beck & Cull, 2014). As stated previously, differences in the ability of banks to perform their transformation function might be related to macroeconomic conditions, the legal framework, or the business environment. In this context, any comparison between and across countries or zones will be biased if we do not control for the specific environment of each country. Many studies already investigated bank efficiency and its determinants at the regional level (Maudos *et al.,* 2002; Chen, 2009; Thi My Phan *et al.,* 2016; Al-Gasaymeh, 2016). However, by pooling banks at the regional level, these studies assume that bank technology and environmental conditions are homogeneous across countries. Thus, this approach may lead to some bias, especially because macroeconomic conditions and legal frameworks are usually different from one country to another.

We follow the same methodology as Dietsch & Lozano-Vivas (2000) to control for environment driven differences in bank intermediation. We adopt the parametric approach (Aigner *et al.,* 1977; Meeusen & van den Broeck, 1977), and more specifically the Stochastic Frontier Analysis (SFA), to conduct our study. In the context of banking efficiency, parametric approaches generally consist of estimating an efficient frontier and then measuring the differences between the point at which each bank is operating (X efficiency) and the efficient frontier. Structural approaches have the advantage of discerning between random errors and inefficiency even if they make some assumptions about their distribution. However, in return, they impose a particular functional form for the frontier. In the literature, for these types of analysis, the Cobb-Douglas and the Logarithmic Transcendental (Translog) production functions are usually used. The Translog function is a generalization of the Cobb-Douglas function. In this paper, we opt for the Translog production function because it offers a flexible (second order) functional form.

We resort to the intermediation approach to select inputs and output. Indeed, one of the characteristics of African banks is the low production of credit despite the predominance of commercial banks, i.e. banks specialized in collecting deposits and granting loans. However, banks in the area are unable to ensure financing of the private sector. For instance, in Africa, only 21% of firms have access to credit, and 45% of the firms consider access to funding as an obstacle to their development (Demirgüç-Kunt & Klapper, 2012). Moreover, only 74% of deposits are converted to credits versus 109% for the other developing countries (Beck *et al.,* 2011b). In this context, it is important to investigate the loan production in SSA and, more specifically, a bank's technical capacity to transform the

collected deposits into loans. Therefore, we consider a Translog stochastic production function (Christensen *et al.,* 1973):

$$LnY_i = \alpha + \sum_{k=1}^{3} \beta_k lnX_{ik} + \frac{1}{2} \sum_{k=1}^{3} \sum_{m=1}^{3} \gamma_{km} lnX_{ik} lnX_{im} + \sum_{p=1}^{5} \delta_p Z_{ip} + \varepsilon_i \quad (1)$$

where Y_i is the production of the i-th bank; X_{ik} (k = 1, 2, 3) is the input k of the i-th bank; Z_{ip} (p=1 to 5) is the environmental variables p of the i-th bank. When the estimates are done without accounting for the environment, we drop the term $\sum_{p=1}^{5} \delta_p Z_{ip}$ in (1). $\varepsilon_i = V_i - U_i$ represents the error term of the i-th bank; V_i are traditional random variables and are assumed to be iid. $N(0, \sigma^2_v)$; $U_i \geq 0$ are random variables that are supposed to account for the technical inefficiencies in the production process. In our model, U_i are independent and identically distributed exponentially with scale parameter σ_u. Model (1) represents a Translog production function with one output and three inputs.

The density function for U_i is given by:

$$f(u) = \frac{1}{\sigma_u} \exp\left\{-\frac{u}{\sigma_u}\right\} \quad (2)$$

V_i and U_i are distributed independently of each other and of the regressors. Thus, their joint density function can be written as the product of their individual density:

$$f(u, v) = \frac{1}{\sqrt{2\pi}\sigma_u \sigma_v} \, exp \, \{-\frac{u}{\sigma_u} - \frac{v^2}{2\sigma_v^2}\} \quad (3)$$

Using model (1), technical efficiency *(TE_i)* is defined as the ratio of observed output to maximum feasible output given the effects of random shocks out of the control of each bank. Technical Efficiency necessarily has values between one and zero. Thus, when the bank achieves its maximum feasibility, the technical efficiency is equal to 1; otherwise, $TE_i < 1$. Mathematically, this definition is formalized by the following expression:

$$TE_i = \frac{y_i}{f(x_i;\beta).exp\{v_i\}} \qquad (4)$$

where $f(x_i;\beta)$ is the production frontier; $epx\{v_i\}$ captures the effect of random shocks on each producer; and y_i, x_i and β are already defined above.

As stated before, the error term of the Translog production function is made up of two components: $\varepsilon = V_i - U_i$. The main problem is to distinguish between V_i et U_i and, more precisely, extracting the information on U_i contained in ε. As a solution, Jondrow *et al.* (1982) proposed to consider the expected value of U_i conditional on ε. They showed that if U_i are distributed exponentially, the conditional distribution of U_i given ε is:

$$f(u|\varepsilon) = \frac{f(u,\varepsilon)}{f(\varepsilon)}$$

$$= \frac{1}{\sqrt{2\pi}\sigma_v \Phi(-\frac{\tilde{\mu}}{\sigma_v})} \exp\left\{-\frac{(u-\tilde{\mu})^2}{2\sigma^2}\right\} \qquad (5)$$

where $\tilde{\mu} = -\varepsilon - (\frac{\sigma_v^2}{\sigma_u})$; Φ is the standard normal cumulative distribution.

$f(u,\varepsilon)$ is the joint density function of u and ε and is given by:

$$f(u,\varepsilon) = \frac{1}{\sqrt{2\pi}\sigma_u\sigma_v} exp\left\{-\frac{u}{\sigma_u} - \frac{1}{2\sigma_v^2}(u+\varepsilon)^2\right\} \qquad (6)$$

$f(\varepsilon)$ is the marginal density function of ε and is obtained by integrating u out of $f(u, \varepsilon)$:

$$f(\varepsilon) = \int_0^{\infty} f(u, \varepsilon) du$$

$$= \frac{1}{\sigma_u} \Phi\left(-\frac{\varepsilon}{\sigma_v} - \frac{\sigma_v}{\sigma_u}\right) exp\left\{\frac{\epsilon}{\sigma_u} - \frac{\sigma_v^2}{2\sigma_u^2}\right\} \quad (7)$$

$f(u|\varepsilon)$ is distributed as $N^{+}(\tilde{\mu}, \sigma_v^2)$, and its mean is given by the following expression:

$$E(u_i|\varepsilon_i) = \tilde{\mu_i} + \sigma_v \left[\frac{\phi\left(-\frac{\tilde{\mu_i}}{\sigma_v}\right)}{\Phi\left(\frac{\tilde{\mu_i}}{\sigma_v}\right)}\right] \quad (8)$$

with ϕ, the standard normal density distribution function.

After obtaining the estimates of u_i, the Technical Efficiency of each bank is measured by:

$$TE_i = exp\{-\hat{u}_i\} \quad (9)$$

Jondrow *et al.,* (1982) defined $\hat{u}_i$ as $E(u_i|\varepsilon_i)$. Thus, by substituting this expression in equation (9), we obtained the following measure of *TE*:

$$TE_i = \exp\{-E(u_i|\varepsilon_i)\} \quad (10)$$

2.3.2. Data

Given our methodology, we resort to two types of data: data from banks' balance sheets and income statements and data related to the macroeconomic conditions and legal framework at the country level, both covering the 2007-2013 period.

Data on banks are provided by Bankscope. We consider all the banks available for UEMOA and CEMAC countries. However, for Guinea-Bissau (UEMOA) and Equatorial Guinea (CEMAC), there is a lack of data. Therefore, we drop these two countries. On UEMOA, our sample is made up of 73 banks, and concerning CEMAC, we have 33 banks in the sample (Table 2.11). These data from banks are used to determine inputs and output.

Here, we consider one output (*Loans*) and three inputs. The first input is *Borrowed funds* defined as total customer deposits plus deposits and short-term funding. The two remaining inputs are those that are traditionally used in production, namely, *Labor* and *Capital*. *Labor* is approximated by Personal Expenses, and Fixed Assets represent *Capital*. Table 2.1 presents the average values of inputs and outputs, in thousands of USD, from 2007 to 2013. The average values of inputs and output suggest that banks in UEMOA are bigger than those in CEMAC. However, we also notice that in UEMOA and CEMAC, financial intermediation is low.

Table 2.1: Descriptive Statistics of inputs and output

This table reports the descriptive statistics of inputs and output. All variables are in thousands of USD.

Variables	Definition	N	Mean	Std Dev.	Minimum	Maximum
CEMAC						
Y: Loans	Total Loans	124	303 008.59	582 132.56	918.22	4 437 432.92
X1: Labor (L)	Personal Expenses	121	9 442.05	12 787.15	910.02	94 003.67
X2: Physical Capital (K)	Fixed Assets	122	13 172	16 841.84	283.31	110 057.8
X3: Borrowed Funds (F)	Total Deposits	115	970 043.79	1 669 841.01	25 612.61	10 648 842.46
UEMOA						
Y: Loans	Total Loans	327	388 052.55	1 011 403.28	44.80	11 421 600
X1: Labor (L)	Personal Expenses	300	15 784.4	59 115.69	3.02	641 100
X2: Physical Capital (K)	Fixed Assets	323	29 035.36	91 116.21	2.56	872 100
X3: Borrowed Funds (F)	Total Deposits	319	1 153 227.58	3 220 403.02	216.76	34 364 800

Environmental variables are provided by World Bank Open Data and the World Bank's Worldwide Governance Indicators (WGI). Throughout the regressions, we consider three major variables related to the quality of institutions: the *Strength of Legal Right Index,* the *Enforcement of Contracts Index,* and the *Regulatory Quality.*

The *Strength of Legal Right Index* is defined by the World Bank (2013b), as 'the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders and thus facilitate lending. The index ranges from 0 to 12, with higher scores indicating that these laws are better designed to expand access to credit.' Credit supply depends on the quality of collateral and bankruptcy laws in force. The *Strength of Legal Right Index* is fundamental in the context of this paper, and more specifically as we are working on developing countries. Indeed, in African countries banks used to invest in government securities (Allen *et al.,* 2011), and lend to large firms (Demirgüç-Kunt & Klapper, 2012) mainly for reasons related to collateral and risk. We expect from banks evolving in countries where the *Strength of Legal Right Index* is strong, to operate more efficiently. Therefore, the Str*ength of Legal Right Index* is likely to shape bank ability to produce credit in SSA countries.

Table 2.2: Descriptive statistics of environmental variables

This table provides descriptive statistics for environmental variables in CEMAC and UEMOA. The Strength of Legal Rights Index is ranged from 0 (Weak) to 12 (Strong). The Enforcement of Contracts Index represents the number of procedures to enforce a contract. The Regulatory Quality is ranged from -2.5 (Weak) to 2.5 (Strong). The Financial Development is expressed in percentage.

Variables	N	Mean	Std Dev.	Minimum	Maximum
CEMAC					
Income (GDP per Capita)	231	3 621.61	3 781.54	333.20	11 791.59
Financial Development (Credit/GDP)	231	9.507	3.64	2.27	14.93
Strength of Legal Rights Index	231	4.182	1.47	3	6
Enforcement of Contracts Index	231	41.654	2.25	38	44
Regulatory Quality	231	-0.912	0.27	-1.38	-0.51
UEMOA					
Income (GDP per Capita)	511	851.97	335.82	302.27	1 528.94
Financial Development (Credit/GDP)	511	20.34	5.06	9.33	33.04
Strength of Legal Rights Index	511	4.29	1.49	3	6
Enforcement of Contracts Index	511	38.13	3.88	32	44
Regulatory Quality	511	-0.55	0.29	-1.00	-0.06

The *Enforcement of Contracts Index* is defined by the number of procedures to enforce a contract. More specifically, the *Enforcement of Contracts Index* is the 'the number of independent actions, mandated by law or courts that demand interaction between the parties of a contract or between them and the judge or court officer' (World Bank, 2013b). Countries that have a low number of procedures have the best effectiveness in terms of enforcing a contract. Conversely, in countries with a large number of procedures, the court system is slow, and the plaintiff has to wait a long time before receiving potential actual payment after filing a dispute. The enforcement of contract is an important issue in African countries, as the lack of contract discipline and thus the lack of respect for contractual obligations is real. For example in Ghana, Fafchamps (1996) documents that harassment is the main form of debt collection, while other enforcement mechanisms like court actions are less important. The reason is that, like in many other African countries, mechanisms allowing firms to share information about bad payers is inexistent. In addition, the non-

respect for contractual obligations is in some cases mainly the results of opportunism and carelessness than poverty and unanticipated income fluctuations. On average, the descriptive statistics show that in CEMAC countries, the number of procedures for enforcement of a contract is 42, while in UEMOA, the plaintiff has to go through 38 procedures before receiving actual payment after filing a dispute (Table 2.2). Comparatively, in OECD countries the number of procedures is on average 32 (World Bank, 2013b). Country effectiveness in enforcing contracts is expecting to be a major determinant of banks' ability to efficiently produce loans.

Last, the *Regulatory Quality* is also considered. This variables 'reflects perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development (Kaufmann *et al.,* 2010). The indicator ranged from -2.5 (weak) to 2.5 (strong). The regulatory quality allows to consider concerns regarding market-unfriendly policies such as price controls, inadequate bank supervision, or excessive regulation. These aspects are essential in developing countries like those of UEMOA and CEMAC. Overall, the *Regulatory Quality* is weak in both zones and is, on average, -0.55 in UEMOA and -0.91 in CEMAC (Table 2.2). These ratings are consistent with the 2013 Doing Business Report where UEMOA and CEMAC countries are classified in the 50 worst performing countries in the world (World Bank, 2013a). A high level of *Regulatory Quality* potentially allows banks to evolve through an attractive environment.

However, aside from these three variables related to the institutional framework, we also control for macroeconomic conditions. To do so, we include two variables that are often used in the literature. First is the *Income* variable represented by GDP per Capita. It is one of the most used variables in empirical studies, especially those related to efficiency (Dietsch & Lozano-Vivas, 2000; Chen, 2009; Kablan, 2009b). We control for GDP per

Capita to account for the general income level, and development within each country. We expect income to influence several aspects related to the demand and supply of banking services, and mainly deposits and loans. Second, we acknowledge that the differences in terms of financial depth between countries may shape the way banks are operating. To account for *Financial Development*, we use a traditional indicator namely, domestic credit to the private sector as a percentage of GDP (Credit to private sector/GDP). This variable has been used by Chen (2009)[17] in an efficiency assessment in Sub-Saharan African middle-income countries. He found a positive impact on banking efficiency. On average, the level of financial development is approximately 20.34% in the UEMOA area versus 9.51% in the CEMAC area (Table 2.2). Regarding environmental variables, all the indicators are weak for both zones, but they appear to be more favorable in UEMOA than CEMAC. Indeed, except for income, all the indicators are higher in UEMOA.

[17]Chen (2009) used deposits to GDP rather than credit to GDP.

2.4. Results

We first present estimates of efficiency scores on a frontier common to all CEMAC and UEMOA countries (2.4.1.), then on separate UEMOA and CEMAC frontiers (2.4.2.). We conclude this section by analyzing how institutional variables condition bank intermediation efficiency (2.4.3.).

2.4.1. Intermediation efficiency scores on a common frontier

The production function is first estimated on a frontier common to all CEMAC and UEMOA countries assuming that efficiency is determined by banking technology only. Therefore, we assume that the environment in which banks operate does not matter. The results show that, on average, the technical efficiency is higher in the UEMOA countries (0.8151) than in the CEMAC zone (0.7343). The difference between the two zones is high (8.08%) and statistically significant at the 1% confidence level (Table 2.3). Thus, banks in UEMOA are technically more efficient than in CEMAC.

Table 2.3: Technical efficiency scores across UEMOA and CEMAC

This table reports the Technical Efficiency (TE) scores on UEMOA and CEMAC Common Frontier for the models respectively without and with environmental variables. ***, **,* indicate a significant mean difference at 1%, 5% and 10%. The standard deviations are in brackets.

	UEMOA Zone [1]	CEMAC Zone [2]	Difference [1] – [2]
Without Environmental Variables	0.8151	0.7343	**0.0808*** **
	(0.0873)	(0.1276)	
With Environmental Variables	0.8233	0.8177	**0.0056**
	(0.0880)	(0.1004)	
N		353	

Before explicitly controlling for the environment, we first test the difference between the two zones by introducing a dummy variable for the UEMOA. Thus, the reference zone is the CEMAC. This estimate permits capture of the zone effects. The dummy variable is significant at the 1% confidence level (Table 2.4, Model 1), confirming the higher level of bank intermediation in the UEMOA. Next, we introduce the environmental variables. All environmental variables except *Regulatory Quality* are significant (Table 2.4, Model 2). *Income* appears with a negative sign in our regressions. *Financial development* has a positive impact on loan production. The *Enforcement of Contracts Index* has the expected negative sign. This variable represents the number of procedures to enforce a contract. A high level of procedures tends to reduce loan production. More surprisingly, the S*trength of Legal Right Index*, which measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders and thus facilitates lending, also has a negative sign.

Table 2.4: Environmental variables on UEMOA and CEMAC frontier

This table displays the stochastic frontier production estimates on CEMAC and UEMOA common frontier. We only report estimates of the tested country-level variables for the production frontier. ***, **, * denote coefficients that are statistically significant at 1%, 5% and 10% level. UEMOA is a dummy variable which is equal to 1 if the bank belongs to UEMOA zone or 0 otherwise.

Variables	**[1]**		**[2]**	
	Coef.	**Std. Err.**	**Coef.**	**Std. Err.**
Intercept	7.070***	2.045	10.488***	2.095
UEMOA	0.378***	0.049		
Income			-0.137***	0.029
Financial Development			0.013***	0.004
Strength of Legal Rights Index			-0.067***	0.015
Enforcement of Contracts Index			-0.017***	0.006
Regulatory Quality			0.079	0.077
Translog Production Function	Yes		Yes	
N	353		353	
Log Likelihood	-161.282		-149.543	

After controlling for the environment, the average technical efficiency is now 0.8233 for UEMOA banks versus 0.8177 for CEMAC banks. However, the average gap of 0.56% is no longer significant (Table 2.3). By controlling for the environmental conditions of each zone, we set a comparable basis. Therefore, in the case of UEMOA and CEMAC countries, bank efficiency in terms of lending is sensitive to the institutional framework.

More precisely, these results highlight the differences between the two zones. Concerning the UEMOA, controlling for the environmental conditions has no material effect on average bank technical efficiency (Table 2.5). This result suggests that in UEMOA countries, banks operate in a homogeneous environment. Conversely, regarding the CEMAC zone, there are some significant differences in efficiency levels once we controlled for the specific environment of each country (Table 2.5). Thus, in the CEMAC zone, banks operate in a heterogeneous environment. On average, in both zones, there is an increase in the efficiency level after having controlled for the environmental effects (Table 2.5).

Table 2.5: Impact of environmental variables inclusion on efficiency scores

This table reports the Technical Efficiency scores on UEMOA and CEMAC Common Frontier. ***, **,* indicate a significant mean difference at 1%, 5% and 10%. The standard deviations are in brackets.

	Without Environment Variables [1]	With Environment Variables [2]	Difference [2] – [1]
All	**0.7927**	**0.8218**	**0.0291*** **
UEMOA Zone	**0.8151** **(0.0873)**	**0.8233** **(0.0880)**	**0.0083**
Benin	0.8262	0.8316	0.0055
Burkina Faso	0.8182	0.8090	-0.0092
Ivory Coast	0.8045	0.8232	0.0187
Mali	0.8134	0.8232	0.0099
Niger	0.8414	0.8514	0.0100
Senegal	0.8359	0.8474	0.0115
Togo	0.7810	0.7827	0.0017
CEMAC Zone	**0.7343** **(0.1276)**	**0.8177** **(0.1004)**	**0.0834*** **
Cameroon	0.7751	0.8199	0.0449
Central African Republic	0.8242	0.8668	0.0426
Chad	0.7569	0.8276	0.0706
Gabon	0.7077	0.8268	0.1191
Republic of Congo	0.6491	0.7698	0.1207
N		353	

2.4.2. Intermediation efficiency scores on separate frontiers

In the previous section, we investigated how the institutional environment conditions bank efficiency on the whole sample by estimating a frontier common to both zones. Here, we closely examine the situation in each zone by estimating two separate frontiers. This approach allows deepening of the analysis within each zone.

2.4.2.1. Intermediation efficiency scores on the UEMOA regional frontier

On its regional frontier, the average technical efficiency in terms of lending for UEMOA banks without environmental variables is 0.8216. By taking into account the potential influence of environment in the model, we observe that the technical efficiency reaches 0.8320. The difference of 1.04% is not statistically significant (Table 2.6). Thus, by controlling for the institutional conditions, we find that in the UEMOA, the efficiency is constant. This finding is also consistent with that on the common frontier.

Table 2.6: Technical efficiency on UEMOA regional frontier

This table reports the Technical Efficiency scores in UEMOA regional Frontier at the country level. ***, **,* indicate a significant mean difference at 1%, 5% and 10%. The standard deviations are in brackets.

	Without Environment Variables [1]	**With Environment Variables [2]**	**Difference [2] – [1]**
UEMOA Zone	**0.8216**	**0.8320**	**0.0104**
	(0.095)	**(0.088)**	
Benin	0.8351	0.8381	0.0031
Burkina Faso	0.8201	0.8293	0.0092
Ivory Coast	0.8169	0.8213	0.0044
Mali	0.8302	0.8433	0.0131
Niger	0.8449	0.8556	0.0107
Senegal	0.8464	0.8422	-0.0042
Togo	0.7791	0.8083	0.0292
N		255	

Regarding the environmental variables, except the *Strength of Legal Right Index*, we find that none is significant (Table 2.7, Model 1). At this stage, this result tends to note that in the UEMOA zone, countries have similar characteristics. To deepen the analysis, we re-estimate the model by including country dummy variables. The estimates are made relative to the Ivory Coast. As with the environmental variables, none of the dummy variables is

significant, confirming that there are no institutional differences between UEMOA countries (Table 2.7, Model 2).

Table 2.7: Environmental variables on UEMOA regional frontier

This table displays the stochastic frontier production estimates in UEMOA. We only report estimates of the tested country-level variables for the production frontier. ***, **, * denote coefficients that are statistically significant at 1%, 5% and 10% level. Benin, Burkina Faso, Mali, Niger, Senegal and Togo are dummy variables. The reference country in model [2] is Ivory Coast.

Variables	**[1]**		**[2]**	
	Coef.	**Std. Err.**	**Coef.**	**Std. Err.**
Intercept	5.208	3.389	1.823	3.157
Benin			0.061	0.083
Burkina Faso			-0.039	0.087
Mali			-0.056	0.082
Niger			0.056	0.108
Senegal			0.101	0.077
Togo			-0.082	0.086
Income	0.121	0.075		
Financial Development	-0.011	0.009		
Strength of Legal Rights Index	-0.053***	0.020		
Enforcement of Contracts Index	0.014	0.011		
Regulatory Quality	0.107	0.098		
Translog Production Function	Yes		Yes	
N	255		255	
Log Likelihood	-96.729		-103.389	

Overall, these results on the UEMOA regional frontier confirm our previous finding on the common frontier concerning the fact that the UEMOA countries are homogeneous. The banking technology is similar through the zone, and the operating conditions appear to be the same regardless of the country. Thus, countries within the UEMOA have close characteristics in terms of banking technology as well as governance practices. In some ways, our results confirm those of Sy (2007), who found that financial integration in the UEMOA area is advanced regarding markets participants facing the same rules. Moreover,

Diarra (2004) also finds that the UEMOA countries are convergent with regard to total outstanding debt and tax pressure. In 2013, among the first four convergence criteria in force, three were respected by all the eight UEMOA countries (Imam & Kolerus, 2013). Thus, the UEMOA countries have begun their convergence, and this is already noticeable in the banking sector.

To summarize, in UEMOA, the efficiency of banks in terms of lending is more related to bank management, i.e., the way banks combine their inputs to produce outputs than institutional and environmental conditions. Moreover, the implemented policies in the context of financial integration are effective because the countries within the area are homogeneous.

2.4.2.2. Intermediation efficiency scores on the CEMAC regional frontier

The results on the CEMAC regional frontier without environmental variables show that on average, banks have a technical efficiency of 0.7705 (Table 2.8). The CEMAC banks still have scope to improve their efficiency in terms of lending. Moreover, the technical efficiencies are heterogeneous within the area. For instance, the difference between the country with the highest efficiency level (0.8537 for Central African Republic) and the country with the lowest efficiency level (0.6686 for the Republic of Congo) is 18.51% (Table 2.8). The standard deviation of the efficiency scores for all CEMAC banks is 13.20%. The technical efficiency reaches 0.8120 on average when the model includes the institutional conditions. The difference with the previous efficiency score is 4.15% and is statistically significant (Table 2.8). Thus, these results note the heterogeneity of the CEMAC zone.

Table 2.8: Technical efficiency on CEMAC regional frontier

This table reports the Technical Efficiency scores in CEMAC regional frontier at the country level. ***, **,* indicate a significant mean difference at 1%, 5% and 10%. The standard deviations are in brackets.

	Without Environment Variables [1]	With Environment Variables [2]	Difference [2] – [1]
CEMAC Zone	**0.7705**	**0.8120**	**0.0415****
	(0.1320)	**(0.1085)**	
Cameroon	0.7927	0.8054	0.0127
Central African Republic	0.8537	0.8568	0.0031
Chad	0.8046	0.7967	-0.0079
Gabon	0.7745	0.8221	0.0476
Republic of Congo	0.6686	0.7917	0.1231
N		98	

We carry out additional estimates by setting dummy variables for CEMAC countries (Table 2.9, Model 2). The whole country dummy is significant, confirming that banks operate in heterogeneous environments. Within the area, countries do not have the same characteristics, so banks are operating in different environments. The financial integration is limited between countries throughout the zone. Regarding the set of environmental variables, they are all significant except the *Regulatory Quality* (Table 2.9, Model 1). Moreover, the signs are consistent with those observed on the common frontier. *Income*, *Enforcement of Contracts Index*, and *Strength of Legal Rights Index* tend to negatively influence lending production in CEMAC. Then, a high level of *Financial Development* is beneficial for banks.

Overall, the results for the CEMAC regional frontier validate those on the common frontier: in the CEMAC zone, countries are heterogeneous, and the institutional framework determines bank efficiency in terms of lending.

Table 2.9: Environmental variables on CEMAC regional frontier

This table displays the stochastic frontier production estimates in CEMAC. We only report estimates of the tested country-level variables for the production frontier. ***, **, * denote coefficients that are statistically significant at 1%, 5% and 10% level. Cameroon, Chad, Republic of Congo and Gabon are dummy variables. The reference country in model [2] is Central African Republic.

Variables	[1]		[2]	
	Coef.	Std. Err.	Coef.	Std. Err.
Intercept	12.742***	4.316	1.531	5.488
Cameroon			-0.5***	0.185
Chad			-0.347*	0.180
Republic of Congo			-0.786***	0.181
Gabon			-0.58***	0.219
Income	-0.202***	0.057		
Financial Development	0.041**	0.017		
Strength of Legal Rights Index	-0.060*	0.036		
Enforcement of Contracts Index	-0.120***	0.034		
Regulatory Quality	-0.481	0.304		
Translog Production Function	Yes		Yes	
N	98		98	
Log Likelihood	-31.322		-32.314	

2.4.3. Determinants of the credit production efficiency gap

The results, both on separate and common frontiers, show that the institutional variables play an important role in conditioning the technical efficiency levels. The knowledge of the particular influence of each of these variables could be useful to make recommendations for the reforms of institutional frameworks. In this last section, we attempt to understand the way in which each variable affects the level of technical efficiency. In other words, we characterize the marginal impact of controlling for each environmental variable on bank technical efficiency. Defining $Diff\_TE_i = TE_{iWith} - TE_{iWithout}$ as the difference in technical efficiency between the frontiers with and without environmental variables, the following model is estimated:

$$Diff\_TE_i = \alpha + \sum_{i=1}^{5} \beta_i EV_i + \varepsilon_i \quad (11)$$

With EV_i, the set of five Environmental Variables used through the regressions.

We estimate several models (Table 2.10). Models 1, 2 and 3 concern the full sample. Model 4 concerns only the UEMOA zone, while the last one is designed for the CEMAC. The results are consistent through all specifications. Indeed, all variables are significant with the same signs except model 5, where the *Enforcement of Contracts Index* and *Regulatory Quality* are not significant.

Table 2.10: Regressions of efficiency scores differences

This table presents the regressions of efficiency level differences on CEMAC and UEMOA common frontier. The dependent variable is estimated as the difference between the efficiency level with environmental variables and the efficiency level without environmental variables. ***, **, * denote coefficients that are statistically significant at 1%, 5% and 10% level. The estimates from models [1], [2] and [3] cover the whole sample. The model [4] and [5] concern respectively the UEMOA and the CEMAC. The standard errors are given in brackets.

	[1]	[2]	[3]	[4]	[5]
Intercept	-0.168*** (0.018)	-0.125 (0.025)	-0.281*** (0.022)	-0.272*** (0.033)	-0.284 (0.174)
Income	0.033*** (0.002)		0.028*** (0.002)	0.025*** (0.003)	0.031*** (0.031)
Financial Development	-0.002*** (0.000)		-0.003*** (0.0003)	-0.003*** (0.000)	-0.008*** (0.002)
Strength of Legal Rights Index		0.010*** (0.002)	0.011*** (0.001)	0.012*** (0.001)	0.016*** (0.005)
Enforcement of Contracts Index		0.002*** (0.001)	0.003*** (0.0004)	0.003*** (0.001)	0.003 (0.004)
Regulatory Quality		-0.053*** (0.007)	-0.009* (0.005)	-0.011*** (0.004)	-0.004 (0.040)
N	353	353	353	255	98
F	205.83***	32.38***	105.5***	47.19***	15.96***
Adj. R^2	0.5379	0.2414	0.6798	0.4762	0.4354

The results show that *Financial Development* and *Regulatory Quality* play a major role in explaining the efficiency gap in terms of lending. Indeed, both variables are negatively correlated with technical efficiency. In countries with low financial depth and weak regulatory quality, the increase in technical efficiency is particularly significant. Conversely, in countries where the financial sector and regulatory framework are more developed, the impact is limited because these countries have already integrated their beneficial aspects on their efficiency levels. Therefore, in countries with low overall efficiency levels, policies on financial development should be a main focus. Reforms that improve the financial depth and the regulatory quality will allow these countries to reduce the gap in efficiency.

Strength of Legal Rights Index, Enforcement of Contracts Index and *Income* have positive signs. These variables show a larger underestimation of bank technical efficiency in countries where these indicators are better, all else being equal. Indeed, when we control for *Income*, the increase in technical efficiency is more important, particularly in high-income countries. Thus, by not accounting for this variable, we underestimate bank efficiency in these countries. This explanation is in line with our previous findings. In fact, we find that the increase in efficiency score is approximately 8.34% for CEMAC countries versus only 0.83% for UEMOA countries (Table 2.5). All else being equal, part of this increase in CEMAC countries can be explained by the fact that, on average, *Income* is high in this zone relative to UEMOA. Moreover, once we control for the legal rules, the gain in technical efficiency is higher, especially in countries with a strong legal framework. In other words, the more powerful the legal rules are, the greater the increase is in technical efficiency. Then, in countries with low legal rules, the inclusion of those variables has a limited impact on bank efficiency. This suggests that improvement of these indicators

would have a limited impact on bank technical efficiency in countries with weak legal institutions, at least in the short run.

As policy implications, reforms that promote the financial sector and the quality of legal framework and sustain growth are necessary to improve the bank technical ability to effectively supply loans to the economy. Moreover, our results overall suggest that ignoring the institutional environment in efficiency measurement generally leads to an underestimation of average technical efficiency. However, all institutional and environmental variables do not have the same impact on bank technical efficiency. Indeed, countries with low technical efficiency could experience a significant increase if they focus mainly on the financial sector rather than entire economic factors.

2.5. Conclusion

In this paper, we investigate how the institutional framework shapes bank ability to perform financial intermediation in Sub-Saharan Africa and, more specifically, in UEMOA and CEMAC countries. We find that banks in the UEMOA zone are more efficient than those of CEMAC when the model does not include the environmental conditions within each zone and country. However, when the model considers the macroeconomic and institutional conditions, the gap between the two zones disappears, becoming statistically non-significant. In other words, there is no difference between UEMOA and CEMAC banks in terms of technical efficiency when the comparison includes the specific conditions in which banks are operating in each country. Thus, the institutional framework plays an important role in explaining the differences in loan production. Considering regional level analyses, results show that environmental conditions among UEMOA countries are homogeneous with regard to credit production, while CEMAC countries are characterized by more

heterogeneous conditions. Accordingly, our methodology provides an original way to characterize the integration of the banking industry in each of these zones.

Overall, macroeconomic conditions and the quality of institutions determine bank ability to supply credit efficiently. However, in those countries and in Sub-Saharan Africa in general, the access to credit is a hindrance for households and small and medium enterprises. In this context, countries should implement the necessary reforms to establish a favorable institutional environment for the banks. More specifically, reforms that promote the private sector and protect the rights of lenders and borrowers are required to increase banks' technical ability to produce credit.

Appendix

Table 2.11: Distribution of the sample

Zone/Country	Number of Banks
CEMAC	**33**
Cameroon	12
Central African Republic	2
Chad	4
Republic of Congo	7
Gabon	8
UEMOA	**73**
Benin	9
Burkina Faso	9
Ivory Coast	19
Mali	10
Niger	5
Senegal	10
Togo	11

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Chapitre 3 - Reserves Hoarding in Banking Industry: Explaining the African Paradox[18]

We analyze the reserves hoarding by Sub-Saharan Africa (SSA) banks while non-financial firms struggle to access to credit. Using country-level data, we show that SSA banks generally face an insufficient demand and then hold larger cash reserves. Hence, a share of their high reserves levels may be involuntary. Analyzing the links between reserves, liquid assets holdings, and deposits instability, we highlight asymmetric liquidity risk management practices where non-cash liquid assets are preferred to absorb increases in credit demand and deposits fluctuations over longer horizons. However liquid assets cannot be related to the current volatility of deposits flows, reinforcing the involuntary dimension of reserves hoarding. Our results suggest that a better risk management framework, and more generally structural policies facilitating the access to credit market may lead banks to displace the reserves towards the private sector.

Keywords: Africa; Banks Reserves; Credit Demand; Credit Supply; Deposits Volatility

JEL Classification: G21; G32; N27; 016

[18] This chapter has been written with Joël Petey.

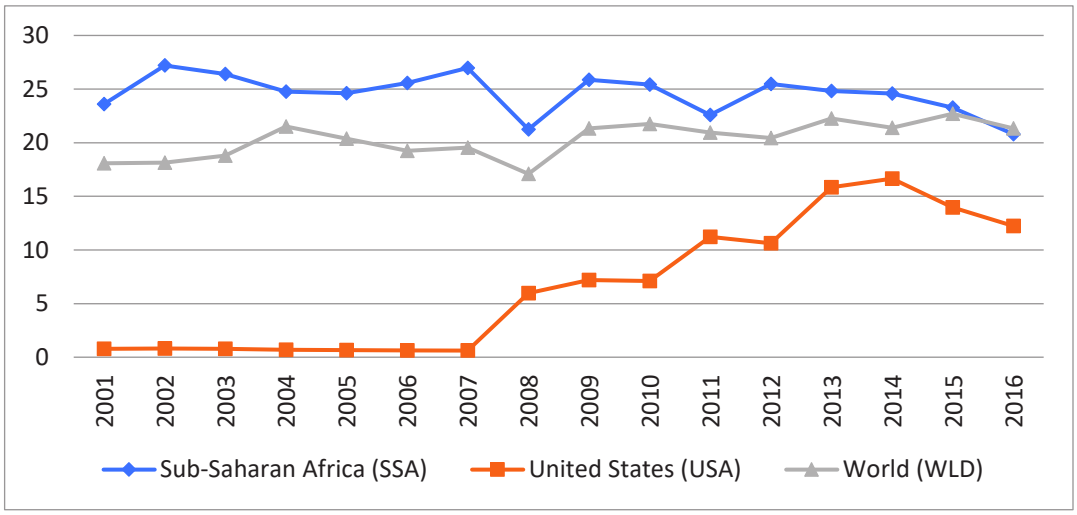
3.1. Introduction

Banks are structurally fragile institutions that supply liquidity to non-financial economic agents while concentrating liquidity risk on their balance sheet (Diamond & Rajan, 2001; Berger & Bouwman, 2009). Accordingly, they hold reserves and liquid assets in order to be able to withstand unexpected withdrawals by depositors or episodes of money markets disruption. Therefore, a set of regulations introduced over the last years imposes minimum liquidity requirements expected to guarantee the short-term liquidity of banks. This conceptual framework assumes, first, that banks face an unflagging demand on the credit market, potentially increasing their illiquidity and, second, that banks may on their own be reluctant to increase their liquid assets holdings. However, if credit demand is weak or has characteristics that cannot be addressed by supply, then banks may hold excess liquidity, i.e. be hindered in their ability to produce liquidity through the transformation of available deposits into loans. While unlikely in developed economies most of the time, this scenario may affect less advanced economies, especially when legal, political, and economic institutions fail to provide an environment favorable to financial contracts. Numerous Sub-Saharan Africa (SSA) countries may fall in this scope.

Indeed, SSA banks hold high levels of reserves as cash, interbank deposits, central bank debt, and short-term government securities (Carpio & Honohan, 1993; Freedman & Click, 2006; Saxegaard, 2006). In fact, over the period 2001 to 2016, the average bank liquid reserves to bank assets ratio ranged from 20% to 30% (Figure 3-1). By comparison, over the same period, the average value of this indicator for the whole World varied between 15% and 20%. Moreover, the difference is huge between the Sub-Saharan Africa and developed countries. Considering the USA, the bank liquid reserves to bank assets ratio

was 1% for a long period, before a substantial increase during the 2007's financial crisis (Figure 3-1). Meanwhile in Ghana liquid funds to liabilities were 62.1%, and reached a peak of 76.5% in Democratic Republic of Congo in 2011 (EIB, 2013).

Figure 3-1: Bank Liquid Reserves to Bank Assets Ratio



Source: Authors estimates using World Bank data

These high levels of hoarded liquidity might be detrimental to the economy for two main reasons. First, the financial sectors of SSA countries are mainly bank-based. For instance, in CEMAC countries, the banking system accounts for more than 80% of financial assets. In many countries, the banking system is more or less the only channel of funding non-financial agents. Second, these financial sectors are underdeveloped. While the median private credit to GDP ratio is 34% in non-African developing countries, this indicator is only 18% in Africa (Beck & Cull, 2014). The conjunction of the structural weakness of banking systems and the hoarding of cash and cash-like assets may exacerbate the difficulties faced by entrepreneurs and small businesses to access credit, as banks could be more willing to lend to large firms (Demirgüç-Kunt & Klapper, 2012). Moreover, the holding of excess reserves may put a cost on banks holding low return assets they could

potentially invest in higher income loan activities, possibly inducing a decrease in bank profitability. Indeed, SSA banks simultaneously hold excess reserves, and yet may be reluctant to lend. In this context of a potentially constrained access to bank credit, the hoarding of reserves by commercial banks is to some extent paradoxical, and therefore requires more attention especially as this situation could be harmful to growth (Freedman & Click, 2006) and weaken monetary policy transmission (Saxegaard, 2006).

Regarding the literature, two approaches allow explaining the hoarding of reserves by commercial banks. Typically, banks hoard liquid reserves in order to hedge against the liquidity risk related to the production of illiquid loans. This hypothesis, also known as the "precautionary motive", is consistent with the modern theory of financial intermediation (Bryant, 1980; Diamond & Dybvig , 1983; Diamond & Rajan,2001). In fact, banks are facing liquidity risk as their main role is to grant illiquid loans to borrowers, while providing at the same time liquidity on demand to depositors (Berger & Bouwman, 2009). Therefore, they hold liquid assets in order to face potential cash withdrawals. However, banks may hoard reserves involuntarily because of disequilibrium between supply and demand on the credit market, i.e. when potential demand is lower than potential supply. A disequilibrium on credit markets can result from a shock on financial institutions curtailing the supply of credit in order to restore their balance sheet in terms of leverage and/or risk-weighted assets, leading to a "credit crunch" (Yuan & Zimmermann, 2004; Ikhide, 2003; Woo, 2003). However, a shock-driven collapse in supply can be contemporaneous with a drop in demand, as firms may adjust to recessionary conditions (Pazarbasioglu, 1997, Claessens *et al.,* 2012, Nguyen & Qian, 2014), leading to a non-univocal effect on the credit market (Kremp & Sevestre, 2013). Moreover, disequilibrium on the credit market may also entail a persistent dimension. Indeed, deficiencies in the lending process, the inability of

banks to tackle informational asymmetries, the lack of viable projects, or projects being identifiable as such, can lead banks to reduce their supply of credit, irrespective of their available resources for intermediation.

In the literature these two approaches of liquidity hoarding are usually examined separately. In this paper, we provide a comprehensive understanding of the reserves hoarding phenomenon in developing countries by considering both simultaneously to explain the accumulation of reserves by commercial banks in SSA. Using the credit market disequilibrium framework (Maddala & Nelson, 1974), we first estimate an indicator representing the disequilibrium between the supply and the demand of credit in the banking industry. Then, using this indicator in addition to liquidity risk as defined in Nketcha Nana & Samson (2014), we identify the determinants of liquidity hoarding by SSA commercial banks.

Our results first show that, most of the times and in most countries, potential credit supply is in excess over demand. This feature, which we assume to reflect the specific constraints weighting on SSA credit markets, may determine the liquidity management of banks. Indeed, our results then show that banks facing an insufficient credit demand hold more reserves the larger the imbalance, but do not necessarily hold more liquid assets. Conversely, banks operating in conditions where demand potentially exceeds supply hold fewer liquid assets the larger the imbalance but do not hold fewer cash reserves on average. This suggests that SSA banks facing a lower credit demand hoard liquid reserves but, on average, do not systematically invest excess liquidity in other liquid assets. On the contrary, when potential credit demand is higher, SSA banks reallocate liquidity to non-financial agents by mobilizing liquid assets rather than cash reserves. This could reflect a pecking-order type of liquidity management, banks preferring first liquidating non-cash liquid assets

to serve demand, keeping in mind that situations of excess supply are the norm. Conversely, they could be reluctant to decrease reserves to produce additional credit, still reflecting liquidity management concerns. Thus, these results highlight an asymmetry in the liquidity management reflecting the balance sheet adjustments operated by SSA banks as credit demand fluctuates relatively to the potential amount of liquidity banks can produce. Moreover, the holding of liquid assets is related to the propensity to observe episodes of repeated withdrawals. Hence, SSA banks do not, on average, adjust their reserves and liquid assets to current fluctuations of deposits but incorporate the possibility of larger cumulated movements in the determination of their buffer of non-cash liquid assets.

In a nutshell, a share of the high reserves levels hoarded by SSA banks is the result of a structurally low demand for credit, which might be related to deficiencies of domestic credit markets. Furthermore, we find no direct evidence for the "precautionary motive" of reserves hoarding when considering deposits volatility as a liquidity risk measure, SSA banks nevertheless manage their overall liquidity positions by adjusting their non-cash liquid assets positions to produce credit. Our results also suggest that policies that aim increasing the depth of credit markets should primarily focus on structural constraints limiting the ability of non-financial agents to access credit.

The remainder of the chapter is organized as follows. Section 3.2 provides the background of the research question. Section 3.3 focuses on the econometric framework. The results are presented in section 3.4. And lastly, we conclude in section 3.5.

3.2. Background

In the 80s, African banking systems went through fragility periods, partly because banks were under-capitalized and illiquid. Nowadays, the trend has been reversed. The African banking industry is sounder. Particularly, banks are characterized by excess liquidity (Honohan & Beck, 2007; Beck *et al.,* 2011b; EIB, 2013). From 2000 to 2015, on average, banks' reserves to deposits have varied between 19% and 30%[19]. In Ghana, the ratio of liquid funds to liabilities went from 41.6% in 2008 to 62.1% in 2011, while the ratio of liquid funds to assets reached 53.6%. Over the same period, in Democratic Republic of Congo, the liquid assets to demand liabilities were averaged a peak of 76.5%, largely superior to the regulatory minimum limit of 20% (EIB, 2013).

In the wake of global financial crisis, analyses show the resilience of SSA banks. In fact, given low leverage, healthy capitalizations levels, but also high liquidity holdings, sub-Saharan Africa banks were well-prepared to handle the 2008's financial turmoil (Beck *et al.,* 2011b; EIB, 2013). Therefore, to some extent, the hoarding of reserves by SSA banks contributes to the soundness of the banking system. However, in those countries, the excess liquidity usually goes hand to hand with a decrease in lending. The access to credit remains the main challenge for firms, and especially SMEs (Demirguc-Kunt & Klapper, 2012). Banks tend to finance large firms, while the SMEs are left out. Thus, while the reserves hoarding allows reducing the volatility and the fragility of financial system, it is also prejudicing bank ability to supply credit. In other words, the hoarding of excess reserves by SSA banks could be considered as reflecting inefficiency in their fundamental role, namely financial intermediation.

[19] Authors' estimates using International Financial Statistics (IFS) data.

The modern theory of financial intermediation explains the liquidity hoarding by commercial banks as a way to guard against liquidity risk (Bryant, 1980; Diamond & Dybvig, 1983; Diamond & Rajan, 2001). In fact, banks use liquid deposits to grant illiquid loans. This situation exposes them to liquidity risk, especially in case of increased deposits withdrawals. Thus, the hoarding of liquidity is an insurance against a potential bank run. Most of papers have focused on this hypothesis to explain the build-up of excess liquidity around the world. In this perspective, Nketcha Nana & Samson (2014) investigate the reserves hoarding by African banks under the precautionary motive by using the volatility of the deposits as main proxy for liquidity risk. The results show that the deposits' volatility has a positive and significant impact on the banks' reserves ratio. Therefore, these results confirm that the liquidity hoarding by African banks could be explained, at least partially, by a precautionary strategy to guard against the traditional risk associated with liquidity services to depositors. Moreover, in SSA countries, liquidity risk could be exacerbated by the fact that the deposit insurance is almost inexistent or deficient in most of countries (Demirgüç-Kunt e*t al.,* 2015), increasing the probability of extreme change in deposits inflows.

However, the hoarding of reserves by commercial banks cannot be explained by the only precautionary motive. First, reserves hoarding could reflect the market power of banks that would only accept to lend if interest rates reach a minimum level. Frost (1971) investigates the causes of large accumulation of reserves in 1930s. The main conclusion links this phenomenon to the low interest rates over the period. Indeed, as pointed out (Frost, 1971, p.821), "banks find it profitable to hold excess reserves at very low interest rates because the costs associated with constantly adjusting reserves position is greater than the interests earned on short term securities". As consequences, their demand for reserves curve is

kinked at very low interest rates. Khemraj (2010) reaches the same conclusions by showing that in Less Developing Countries (LDCs) the liquidity preference curve is flat at a very high loan rate. In fact, banks require a minimum interest rate before lending to borrowers. They continue to lend as long as borrowers are able to pay the minimum interest rate. However, when borrowers fail to pay the minimum required interest, banks begin to accumulate excess reserves. Generally, in those countries, the flatness occurs at a very high interest rate. For example, concerning Guyana, Jamaica, Uganda and Namibia, the liquidity preference curve becomes flat at respectively 14.5%, 17%, 19% and 11%. Similarly, Dow (2001) finds that for US banks, excess reserves tend to decrease when the interest rates are high.

Second, hoarded liquidity could be involuntary in the sense that it could reflect a lack of investment opportunities. Saxegaard (2006) by investigating the phenomenon of excess liquidity in Sub-Saharan Africa makes a distinction between excess liquidity held for precautionary motive, and involuntary excess liquidity. The latter emerges from the reluctance of commercial banks to supply credit, due to the difficulties of a deficient lending process to identify and price credit risk. On the one hand, banks consider the lack of bankable projects as the main reason of holding high liquidity (Mecagni *et al.*, 2015; EIB, 2015; Honohan & Beck, 2007). In Democratic Republic of Congo, the difficulties face by banks in enforcing their legal rights as lenders contribute to the build-up of excess liquidity (EIB, 2013). On the other hand, firms and especially SMEs are discouraged to apply for credit because they cannot satisfy banks' requirements in terms of collateral and documentation (Beck *et al.,* 2011). Therefore, in addition to liquidity held for precautionary motive, commercial banks in SSA build-up involuntary excess liquidity. Overall, their results suggest that the deficiency in lending process and the increase in deposits, especially

government deposits, contribute to explain this involuntary excess liquidity. However, Saxegaard (2006) identifies involuntary liquidity in an indirect way as a gap with a theoretically expected reserves level. In this paper, we reconsider these arguments by introducing an explicit measure of the potential constraint that the situation of the credit market exerts on banks and, more specifically, on their liquidity holdings.

According to Freedman & Click (2006, p.289), the accumulation of excess liquidity in developing countries can be explained by the following reasons: "(i) higher reserve requirements due to greater macroeconomic risk and volatility; (ii) significant deficiencies in the legal and regulatory environment which make it difficult to enforce contracts and foreclose on collateral; (iii) widespread availability of government bonds which crowds-out private investment; (iv) substantial asymmetric information due to the fact that lenders often know little about prospective borrowers; and (v) inadequate skills for assessing risk and managing non-sovereign loans.". Therefore, some reforms have to be undertaken in these domains in order to redirect the excess liquidity towards the private sector.

The consequences of reserves hoarding on economy are diverse. However, such consequences could be highlighted through two main channels: the opportunity cost of holding excess liquidity, and the negative impact on the monetary policy. The accumulation of reserves by commercial banks has an important opportunity cost on the economy. In developing countries, the financial markets are underdeveloped. The economy is financing by the banking system. Usually, only the large firms have access to credit line. The SMEs suffer of lack of credit. Funds which could be used to finance the private sector are hoarding by banks as reserves. This fact has an important impact on growth by hampering the financial development. And yet, as point out by Levine *et al.* (2000) the financial development has a positive impact on the growth rate. Freedman & Click (2006) investigate

the potential consequences on growth of transferring the excess liquidity to private sector through lending channel. By examining the results from Levine *et al.* (2000) concerning the link between financial intermediation and growth, Freedman & Click (2006) note that bank credit to private sector has more important impact on growth than deposits. Indeed, a 10% increase in credit to private sector is associated with a 0.25% higher per capita growth rate, versus only 0.17% in the case of deposits. Using this conclusion, they investigate the potential additional growth rate if bank's excess reserves were transferred to private sector by the channel of lending. The estimates indicate that on average the additional growth rate would be 1.1% in developing countries, with a cap of 2.8% for Jamaica. Therefore, the hoarding of excess reserves hampers the economic development in developing countries by reducing significantly the growth rate.

Another consequence of reserves hoarding is the impact on monetary policy transmission. This consequence is widely explored by the studies on excess reserves. Overall, most of studies conclude that the excess reserves have a negative impact on the monetary policy transmission. Saxegaard (2006) examines the phenomenon of excess liquidity in SSA and the implications for the effectiveness of monetary policy. The results suggest that the excess reserves weaken the monetary policy transmission mechanism, and therefore the ability of the monetary authorities to influence demand conditions in the economy. Khemraj (2010) also points out that in the case of Less Developing Countries (LDCs), indirect monetary policy through the loan market becomes effective only when the loan rate is high. Nguyen & Boateng (2013) study the mechanism of lending channel in China, and to what extent bank-specific characteristics affect monetary policy transmission in presence of excess reserve beyond the precautionary levels. The results show that banks with large involuntary reserves tend to be less respond in the tightening of the monetary policy. Moreover, in

presence of involuntary excess reserve, large banks and liquid banks are more likely to take greater risk. As consequences, when monetary policy is tightened, their capacity to extent credit is curtailed.

3.3. Econometric framework

In this paper, we tackle simultaneously both issues of liquidity risk and the effect of a deficient lending process in order to provide a comprehensive understanding of the reserves hoarding in SSA countries. First, the abovementioned deficiencies of the lending process, combined with the economic context, lead to disequilibrium on the credit market by lowering the viable credit demand. Thus, the hoarding of reserves by banks in SSA could reflect an insufficient demand given available resources, i.e. a situation of excess supply. The direct identification of this situation requires an indicator characterizing the direction and the degree of disequilibrium on the credit market (3.3.1.). Second, we estimate the liquidity risk by using the dispersion of deposits as proxy (3.3.2.). Lastly, we explain the reserves hoarding in SSA countries by the disequilibrium on credit market and the liquidity risk (3.3.3.).

3.3.1. Disequilibrium on the credit market

We rely on the general market disequilibrium model (Fair & Jaffee, 1972), to estimate the disequilibrium between supply and demand on the credit market. This disequilibrium model is estimated using the Maximum Log-likelihood method suggested by Maddala & Nelson (1974). With this method, the estimations do not depend on the sample separation, but allow estimating the probabilities with which each observation lies on the demand or supply function. However, the method is based on the assumption of serial independence

for the residuals. The disequilibrium model allows distinguishing between periods of excess supply or excess demand because there is assumption that the credit market does not clear at any time period. In period of excess supply, the observed credit represents the demand for loans. Thus, the total supply of loans is not absorbed by the market. Conversely, in the presence of excess demand, the observed credit is equal to the supply. In this context, banks are unable to satisfy the demand for loans. These relations are formalized by the following equation:

$$C_t = \min\left(C_t^d, C_t^s\right) \quad (1)$$

Where: C_t is the quantity of credit observed at time *t*. C_t^d is the quantity of credit demanded during the period *t*, and C_t^s, the quantity of credit supplied during the period *t*.

C_t^d and C_t^s are unobservable, and are written as:

$$C_t^d = X'_{1t}\beta_1 + u_{1t} \quad (2)$$

$$C_t^s = X'_{2t}\beta_2 + u_{2t} \quad (3)$$

Where: X'_{1t} and X'_{2t} denote the variables that influence C_t^d and C_t^s respectively; β_1 and β_2 are the parameters, while u_{1t} and u_{2t} are the residuals.

Given the assumption that u_{1t} and u_{2t} are independently and normally distributed with variances σ_1 and σ_2, the density functions and the distribution functions are expressed as follow:

$$f_1(C_t) = \frac{1}{\sqrt{2\pi\sigma_1}} exp\left[-\frac{1}{2\sigma_1^2}(C_t - \beta_1 X'_{1t})^2\right] \quad (4)$$

$$f_2(C_t) = \frac{1}{\sqrt{2\pi\sigma_1}} exp\left[-\frac{1}{2\sigma_2^2}(C_t - \beta_2 X'_{2t})^2\right] \quad (5)$$

$$F_1(C_t) = \frac{1}{\sqrt{2\pi\sigma_1}} \int_{C_t}^{\infty} exp\left[-\frac{1}{2\sigma_1^2}(C_t^d - \beta_1 X'_{1t})^2\right] dC_t^d \quad (6)$$

$$F_2(C_t) = \frac{1}{\sqrt{2\pi\sigma_2}} \int_{C_t}^{\infty} exp\left[-\frac{1}{2\sigma_2^2}(C_t^s - \beta_2 X'_{2t})^2\right] dC_t^s \quad (7)$$

When $C_t^d < C_t^s$, C_t is determined by the demand equation. Therefore, the conditional density of C_t is given by:

$$\frac{f_1(C_t).F_2(C_t)}{pr(C_t^d < C_t^s)} \quad (8)$$

When $C_t^s < C_t^d$, C_t is determined by the supply equation. In this case, the conditional density of C_t is given by:

$$\frac{f_2(C_t).F_1(C_t)}{1 - pr(C_t^d < C_t^s)} \quad (9)$$

Given that C_t is determined by either demand with probability $pr(C_t^d < C_t^s)$, or supply with probability $1 - pr(C_t^d < C_t^s)$, the unconditional density of C_t is given by:

$$f(C_t|X_{1t}', X_{2t}') = pr(C_t^d < C_t^s)\left[\frac{f_1(C_t).F_2(C_t)}{pr(C_t^d < C_t^s)}\right] + \left(1 - pr(C_t^d < C_t^s)\right)\left[\frac{f_2(C_t).F_1(C_t)}{1 - pr(C_t^d < C_t^s)}\right] \quad (10)$$

And then:

$$f(C_t|X_{1t}', X_{2t}') = [f_1(C_t).F_2(C_t) + f_2(C_t).F_1(C_t)] \quad (11)$$

If L is the log-likelihood, then:

$$L = \sum_{t=1}^{n} \log[f(C_t|X_{1t}', X_{2t}')] \quad (12)$$

Therefore:

$$L = \sum_{t=1}^{n} \log[f_1(C_t).F_2(C_t) + f_2(C_t).F_1(C_t)] \quad (13)$$

The endogenous variable in the disequilibrium model is the "*Claims on private sector*" which refers to gross credit provided by banks to individuals and firms. This raises the question of the interpretation of results would an excess supply situation identified for some country-years in the data. At first sight, it could seem counterintuitive to identify a situation of lacking demand while the immensity of funding needs of SSA countries is unanimously acknowledged. However, some evidence suggests that claims on the private sector merely correspond to credits granted to established firms. Indeed, in developing countries and by

contrast to high income countries, when it comes to borrowing, individuals or small firms are more likely to rely on family, friends, or various forms of semi-formal finance institutions such as rotating savings and credit associations. Moreover, in most SSA countries, adults have only a very limited access to formal, i.e. commercial bank credit. Hence, in 2017, no more than 5% of adults owing some financial debt had access to formal borrowing in countries like Ivory Coast, Democratic Republic of Congo, or Nigeria. Only in relatively more developed countries as Kenya or South Africa can this share reach around 15% (Demirgüç-Kunt *et al.,* 2018). Overall, these figures show that in developing countries, and more specifically in SSA countries, individuals use mostly informal sources of borrowing instead of resorting to banks. In fact, the inability to satisfy banks requirement notably in terms of collateral may explain this situation. Consequently, the "*Claims on Private Sector*" measured at the aggregate level largely represent the amount of credit granted by banks to firms, and usually to larger firms. Accordingly, given the limited reach of potential demand, it becomes likely that available deposits may not be entirely transformed into loans.

Prior to the estimations, we follow the literature to identify the determinants of credit demand and supply in Sub-Saharan African countries. However, countries in this region differ from developed countries, and even from non-African developing countries, especially regarding the structure of their economies. Indeed, in most African countries, the economy is based on agriculture, as well as in exporting raw materials and importing finished products. Thus, we take into account these specificities in selecting demand and supply drivers of credit. Besides, following Djankov *et al.* (2007), we acknowledge that domestic features such as the legal origin, and more specifically the creditors rights and information sharing are important determinants of private credit. We account for this aspect

by introducing country fixed effects in the regressions, allowing controlling for the specificities between countries.

We assume that in Sub-Saharan Africa banking industry, the credit demand is driven by the following variables. The *lending rate* is used as cost of credit for borrowers (Hurlin & Kierzenkowski, 2007; Poghosyan, 2011; Adolfo & Roberto, 2002; Laffont & Garcia, 1977). Under rationality assumption, households and companies aim to borrow at the lowest interest rate. Therefore, the lending rate is expected to be negatively correlated with the demand of credit. To account for the dynamic of the economic activity we use the *GDP, the import of goods and services,* the *export of goods and services* (Vouldis, 2015; Adolfo & Roberto, 2002; Schmidt & Zwick, 2012; Hurlin & Kierzenkowski, 2007). In periods of strong economic activity, the demand of credit from households and companies is expected to go up. Moreover, companies need funds to support their importations and exportations. In the case of SSA, these variables could play an important role as countries are widely dependent on importations for household's products, and exportations for flowing out agricultural and mineral products. As the previous variables, we also introduced the *aggregate raw materials index* as proxy for the economic activity. Indeed, in SSA countries, most of countries are producers of raw materials. In some countries, the economy is mainly based on this activity. Therefore, this variable is common and specific for SSA countries, where the economic activity is not diversified. We include the *lagged loans* as determinant in the demand function (Baek, 2005; Schmidt & Zwick, 2012). Basically, with this variable, we make assumption that the demand of credit for actual period depends on the quantity of credit obtained in the previous period. This variable allows capturing the dynamic effects on the credit market. And lastly, the *inflation* accounts for the potential instability of the macroeconomic framework due to a sustained increase in general price

level of goods and services. The inclusion of this variable in the case of Sub-Saharan Africa could make sense as in many countries those in charge of monetary policies have difficulties to control the inflation rate. However, the effects of inflation on demand of credit are questionable. For Pazarbasioglu (1997), this variable should be positively correlated to the demand for credit, while Ghosh & Ghosh (1999) sustain that in presence of inflation, the demand for credit tends to go down.

Concerning the supply function, we consider the following variables as determinants. The *lending rate* already includes in the demand function, may also influence banks behavior in supplying credit (Poghosyan, 2011; Bauwens & Lubrano, 2007; Adolfo & Roberto, 2002; Kim, 1999). In fact, we expect banks to extend credit as long as the interest rate matches their expectations. We introduce in the supply function the *lending capacity*, a key variable in the context of credit market disequilibrium model (Oulidi & Allain, 2009; Adolfo & Roberto, 2002; Vouldis, 2015; Ikhide, 2003; Poghosyan, 2011). This variable captures bank's ability to extend credit. Banks' lending capacity is estimated as the total collected deposits, adjusted by the required reserves from Central Bank. Thus, we make an implicit assumption that after having fulfilled the required reserves constraint, the remaining funds are available for lending. A higher lending capacity strengthens bank's ability to expand credit. We take into account the cost of borrowed funds with the *deposit rate* (Hurlin & Kierzenkowski, 2007). The holders of liquidity are looking for the best investment opportunities. Thus, there is a positive correlation between the quantity of collected deposits and the level of proposed deposit rate. A high deposit rate enables banks to collect more deposits. As consequence, their lending capacity also increases, and thus their ability to expand credit. The *JP Morgan agricultural index is* introduced to account for the volatility related to the agricultural products on the market. We expect a negative

sign for this variable. In fact, the exportation of agricultural products is an important economic activity in many SSA countries. A high level of volatility represents an uncertainty for the related revenues. This could have an impact on deposits, on bank's lending capacity, and thus on credit supply. As in the demand function, we also include the *lagged Loans* in the specification of the supply function. The amount of current supply credit may be determined by the previous granted loans (Baek, 2005; Schmidt & Zwick, 2012). And finally, the *Return on Equity (RoE)* and the *Return on Assets (RoA)* are supposed to take into account bank's profitability (Čeh *et al.,* 2011). The profitability could be a key variable in credit market, especially in SSA countries where the main activity of banks consists in collecting deposits and potentially granting loans. Therefore, with a higher profitability, banks should be more willing to increase the supply of credit.

Knowing respectively the estimated supply and the estimated demand, the *disequilibrium indicator* is therefore estimated as the difference between these two variables divided by the *claims on private sector*[20]. However, such variable does not allow distinguishing between periods of excess demand or excess supply. To fill the gap, we introduce two additional variables: the *excess supply* and the *excess demand*. Indeed, we first create two dummy variables: *positive disequilibrium dummy* and *negative disequilibrium dummy*. The first one is equal to 1 if the *disequilibrium indicator* is positive and 0 otherwise. The second dummy takes 1 as value if the *disequilibrium indicator* is negative and 0 otherwise. Finally, the multiplicative interaction terms *disequilibrium indicator*positive disequilibrium dummy* and *disequilibrium indicator*negative disequilibrium dummy* represent respectively the *excess supply* and the *excess demand.* Accordingly, we estimate the sensitivity of reserves to changes in the disequilibrium on the credit market conditional to

[20] $Disequilibrium\ Indicator = \frac{(Estimated\ Supply - Estimated\ Demand)}{Claims\ on\ Private\ Sector}$

its sign. This allows highlighting a potential asymmetry in the reserves management decisions of banks given the state of the credit market.

3.3.2. Liquidity risk

To account for banks' exposure to liquidity risk, we refer to the modern theory of financial intermediation stating that banks usually hold liquidity in order to guard against the liquidity risk (Bryant, 1980; Diamond & Dybvig, 1983; Diamond & Rajan, 2001). Indeed, banks are in charge of providing a dual service: first make illiquid loans to borrowers, and then provide liquidity on demand to depositors. However, this traditional activity exposes them to liquidity risk given that demand for cash withdrawals may occur before loans pay back. The exposure to liquidity risk is more important in SSA banking industry especially as cash is largely used rather than electronic payments (Demirgüç-Kunt *et al.,* 2018). Moreover, bank run are likely to occur as in most of countries the deposits insurance is deficient. To account for the liquidity risk, we rely on Nketcha Nana & Samson (2014), and use the *volatility of deposits* as proxy. Thus, one assumes that banks will always maintain a large amount of reserves as long as the uncertainty concerning the volume of deposits in near future is high. This indicator is built from monthly data, allowing increasing its soundness in terms of time varying.

The *volatility of deposits* is replicated as follows:

$$Vol_t = \frac{\sqrt{(\frac{1}{N-2})\sum(d_{tn} - \bar{d}_{tn})^2}}{\mu_t} \quad (14)$$

Where *t* is for years and *n* for months;

$d_{tn} = Log(D_{tn}) - Log(D_{t,n-1})$, with D_{tn} the total bank deposits of the nth-month of the period *t*.

$\bar{d}_{tn}$ is the mean of d_{tn} over the N-months period t;

And: $\mu_t = (\frac{1}{N})\sum Log(D_{tn})$

In addition to the *volatility of deposits*, we introduce the *skewness of deposits*[21] in order to account for the positive and negative changes in deposit inflows, and especially the possibility of asymmetric changes in deposit inflows (Nketcha Nana & Samson, 2014). According to the previous definitions, positive (resp. negative) skewness implies that deposits outflows (resp. inflows) are more likely to occur than inflows (resp. outflows). Accordingly, commercial banks may adapt their holdings in liquid assets. While skewness does not measure the likelihood to observe extreme outflows of deposits, it provides an indicator of the specific context within banks operate.

[21] The skewness is computed as follows:

$$Skewness\ of\ deposits = \frac{\frac{1}{N}\sum(d_{ti} - \overline{d_{ti}})^3}{(\frac{1}{N}\sum(d_{ti} - \overline{d_{ti}})^2)^{3/2}}$$

3.3.3. Model and Data

We mainly explain the hoarding of reserves in SSA banking industry by the two variables estimated above: the *disequilibrium indicator* and the *volatility of deposits.* Besides, we also control for two other variables. First, we take into account banks' capitalization level by introducing the *equity to assets* ratio because the level of equity may influence the amount of reserves by being a substitute or a complement (e.g. DeYoung *et al.*, 2018). Second, the *reserves requirement rate* is considered. In fact, the level of reserves depends primarily on the reserves requirement rate set by the central bank. A high reserves requirement rate should be associated with observed high level of reserves.

Reserves, mainly under the form of accounts opened at the Central Bank, are a central but not the only means for a bank to manage its liquidity position. Indeed, holding liquid assets allows allocating liquidity beyond reserves. Thus, reserves by themselves may not totally reflect the liquidity management decisions made by banks. Indeed, banks may try to reduce the opportunity costs of reserves by investing a share of cash resources in interest bearing assets. However, African banks may differ in their ability to access such assets. For instance, banks affiliated to international groups may get an easier access to non-cash liquid assets. Moreover, we could expect cash reserves to reflect rather short-term management decisions, while including other types of assets may reflect more long-term oriented policies. Ihrig *et al.* (2019) show that US banks exhibit a high variance in the composition of their pool of high-quality liquid assets, suggesting a strong substitutability across cash and other liquid assets, possibly determined by asset returns, bank business models, and bank internal procedures. These results highlight the importance to also adopt a broader view of liquidity.

In order to get a possibly broader view, we consider two indicators allowing to characterize the hoarding behavior of African banks. We first consider the *reserves to deposits* ratio, which reflects the traditional definition of reserves, defined as banks claims on central banks, including commercial banks' currency with central banks, holding of securities issued by central banks, and other claims on central banks. However, banks may also decide to allocate a share of available either voluntary or involuntary cash resources to other liquid assets, typically short-term government securities. Therefore, in order to consider this characteristic, we extend our definition of reserves by adding the claims on central government, as well as claims on nonresidents[22], leading to the second indicator of liquidity: *extended reserves to assets*. We thus expect to get a broader view of the liquidity management of African banks.

The following model is then estimated:

$$Liquidity\ indicator = \alpha + \beta X + \varepsilon \qquad (15)$$

With: X the set of variables explaining reserves holding in SSA banking industry, including the *disequilibrium indicator* and the *volatility of deposits*; β the set of parameters; $liquidity\ indicator$ the *reserves to deposits* or *extended reserves to assets*, depending on the estimated model; and ε the residuals.

Besides the ordinary least squares (OLS), the model is estimated using panel regressions with both country and year fixed-effects and by clustering the standards errors at the

[22] Although these variables correspond to broader concepts than liquids assets, we assume that both claims on central government and foreign assets correspond to the sets where African banks possibly access to liquid assets, especially given the practical non-existence of interbank and money markets.

country level, allowing dealing with potential unobserved heterogeneity. The paper deals with aggregate data at the country-level. The sample includes 26 SSA countries where data were available from 2000 to 2014. We resort to several databases: International Financial Statistics (IFS) Database, Word Development Indicators Database and Bloomberg Professional Server. Thus, variables used to estimate the supply and demand function such as *lending rate, loans, deposits, deposits rate,* are taken from the IFS Database, while the *JP Morgan Agricultural Index is* from Bloomberg Professional Server. The remaining variables used in the estimates are from Word Development Indicators Database. However, it is worth to mention that we also manually collected the *required reserves rates* from countries' central bank in order to build the *lending capacity* variable.

Table 3.1: Descriptive statistics

This table reports descriptive statistics on variables used within the estimates. The GDP, Claims on Private Sector, Lagged Loans, Lending Capacity, Estimated Demand, Estimated Supply, Disequilibrium are expressed in billions of USD. The other variables are in percentage.

Variables	N	Mean	SD	Min	Max
Deposit Rate	226	8.583	6.842	2.433	48.691
Return on Assets (RoA)	226	2.173	1.772	-4.678	9.908
Return on Equity (RoE)	226	22.326	20.356	-48.863	160.344
Exports of Goods and Services	226	36.155	20.065	6.320	110.618
GDP	226	22.897	48.814	487.039	299.415
Imports of goods and Services	226	44.483	31.452	18.287	246.812
Inflation	226	10.280	25.771	-8.975	324.997
Aggregate Raw Materials Index	226	81.398	12.027	62.881	109.965
Lending Rate	226	20.069	15.733	5.570	103.160
JP Morgan Agricultural Index	226	18.111	5.623	12.620	32.980
Claims on Private Sector	217	8.715	31.677	34.415	242.529
Lagged Loans	217	7.305	26.958	25.739	198.862
Lending Capacity	226	21.751	107.205	22.300	922.125
Estimated Demand	217	10.781	35.405	0.064	265.870
Estimated Supply	217	11.273	36.264	0.084	246.830
Disequilibrium	217	492.142	4.345	-19.030	45.991
Disequilibrium Indicator	217	10.786	21.191	-22.613	67.327
Reserves to Deposits	217	18.423	12.324	34.093	94.893
Volatility of Deposits	217	0.229	0.149	0.041	1.167
Skewness of Deposits	217	-3.105	91.244	-323,562	233
Extended Reserves to Assets	182	42.046	12.666	11.867	78.970
Excess Supply	217	13.677	18.264	0.000	67.327
Excess Demand	217	-2.891	5.6	-22.613	0.000
Equity to Assets	182	10.238	3.038	0.575	20.430

3.4. Results

3.4.1. Credit market

The results from the credit market disequilibrium model are reported in Table 3.2. All the determinants considered in the demand and supply functions are statistically significant, with the majority having the expected signs. The dynamic of the economy measured by the *GDP* has a positive impact on the demand of credit in SSA countries. As Adolfo & Roberto (2002), Vouldis (2015) and Čeh *et al.* (2011), we find that the demand for credit tend to increase in periods where the economy is better performing. However, given the specificity of SSA countries, we consider three other variables. Indeed, African countries are well known as specialized in out-flooding raw materials and importing finished products. Thus, we account for the *import and export of goods and services.* The results are consistent with our primary measure (*GDP*). Both variables are positively correlated with credit demand in SSA. On the one hand, firms demand for credit to support the costs associated with the importations. Such costs could be huge as African countries almost import all products related to household appliances, medicine and cars industry. Moreover, we observe a positive correlation between the demand of credit and the exportations of goods and services, reflecting the link between the openness of the economy and funding needs. And lastly, the *raw materials index* confirms the previous results. We also consider the economic instability by introducing the *inflation*. In the literature, there is no clear consensus concerning the expected parameter sign for this variable. Ghosh & Ghosh (1999) find that demand for credit tend to decrease in case of high inflation. In this paper, as Pazarbasioglu (1997) for the Finland, we find that inflation increases credit demand in

SSA countries. On the credit supply side, the *JP Morgan agricultural index* turns out with an unexpected and significant positive sign.

The *lending rate* is also one of the key drivers of both demand and supply of credit. Considered as cost of credit for borrowers, we were expecting a negative sign for this variable as several papers in the literature (Hurlin & Kierzenkowski, 2007; Poghosyan, 2011; Adolfo & Roberto, 2002; Laffont & Garcia, 1977). Conversely, the results show a positive and significant association with the demand of credit. Such results are in some extents counterintuitive as firms and households are supposed to lower their demand for credit when the lending rate goes up. However, Herrera *et al.* (2013) by studying the tightening of credit supply in Egypt also find an unexpected positive sign. The *lending rate* also has a positive impact on credit quantities. In fact, banks are willing to extend credit as long as they are able to charge higher interest rates. The positive sign of both *Return on Equity* (RoE) *and Return on Assets* (RoA) confirm this result.

On the supply side, we consider the *lending capacity* as the leading determinant of credit supply. Indeed, bank ability to supply credit is highly dependent to the available resources. We find that higher lending capacity leads bank to extend credit. The positive correlation between the *deposit rate* and the supply of credit allows confirming this result. In fact, higher deposit rate may lead to high collected deposits, then high lending capacity and therefore high credit supply. Finally, the *lagged loans* included in both supply and demand functions suggest dynamic effects on credit markets in SSA.

Overall, we find that, on average, credit markets in SSA countries are characterized by an excess of potential supply. More specifically, 71% of all country-years observations in the sample are characterized by an excess supply situation. Table 3.5 in the appendix shows

the time changes of the share of countries with an excess credit supply. While we observe some fluctuations across time, excess supply remains the ordinary situation of most SSA countries. Our results are consistent with other studies on the topic in developing countries. Herrera *et al.* (2013) by studying the credit market in Egypt, find a persistence of excess supply from 2003 to 2011. Similarly, Oulidi & Allain (2009) show that there was no credit rationing in Morocco during the first half of the 2000 decade. Indeed, this period was characterized by an excess supply. In Latina America countries, and more specifically in Mexico, Adolfo & Roberto (2002) find that during the credit slowdown in 1990-2000, the credit market was led by an excess supply. These first results underline the specificity of SSA credit markets that are characterized by a most common situation of excess credit supply. This situation may exert a structural constraint on the activity of commercial banks in general and, more specifically, on their liquidity holdings. The following subsection incorporates our disequilibrium measure as a possible determinant of reserves hoarding.

Table 3.2: Parameters estimation of the credit market disequilibrium model

This table reports the estimates of demand and supply function

Variables	Parameters	Standard Errors
Demand Function		
Intercept	0.209***	0.065
Lending Rate	0.136**	0.063
GDP	0.141***	0.047
Aggregate Raw Materials Index	0.146***	0.046
Imports of goods and Services	0.141**	0.061
Exports of Goods and Services	0.177***	0.057
Lagged Loans	0.136***	0.050
Inflation	0.136**	0.055
Supply Function		
Intercept	0.108***	0.028
Lending Rate	0.135**	0.065
Lending Capacity	0.174***	0.060
Deposit Rate	0.187***	0.066
JP Morgan Agricultural Index	0.186**	0.081
Lagged Loans	0.169***	0.064
Return on Assets (RoA)	0.131**	0.056
Return on Equity (RoE)	0.145***	0.055
Sigma Demand	0.934***	0.093
Sigma Supply	0.991***	0.099
Likelihood	-211.855	
N	226	

3.4.2. Explaining liquidity hoarding by SSA banks

The regression results of the liquidity indicators are displayed in Tables 3.3 and 3.4. In Table 3.3, we first present the results with the *reserves to deposits* as dependent variable. The results using the *extended reserves to assets* are provided in Table 3.4.

First, we consider OLS regressions (Models 1 and 2). This first specification serves as a benchmark as it is closest to the approach of Nketcha Nana & Samson (2014) who analyses specifically the precautionary motivated hoarding of reserves, using similar country level

data. We observe that for these OLS regressions, the *disequilibrium indicator* is not statistically significant for both definitions of reserves (Tables 3.3 & 3.4, Models 1 & 2). This suggests that the hoarding of reserves by banks in SSA is not associated with the direction and level of disequilibrium on the credit market, even when distinguishing between excess supply and excess demand.

Moreover, we find a significant positive association between the hoarding of reserves and the volatility of deposits, which is highly significant for both reserves indicators, implying that banks hold more reserves when the uncertainty regarding deposits withdrawals is larger. In addition, the skewness of deposits is not statistically significant. In SSA countries, the volatility of deposits is exacerbated by the preference for cash leading banks to constantly hold liquidity in order to face frequent withdrawals. The preference for cash is explained by the fact that, conversely to developed countries, electronic payment is underdeveloped, even if in recent years the mobile banking has emerged. Besides, the non-existence of deposits insurance in most countries[23] increases the likelihood of bank runs to occur, inducing banks to be more cautious in managing their liquidity. Regarding our control variables, only the mandatory reserves requirement is, unsurprisingly, highly significant. At this stage, when considering only the OLS regressions, our results are consistent with the literature. In fact, the reserves hoardings in SSA banking industry appears to be mainly driven by the precautionary motivation (Nketcha Nana & Samson, 2014). Moreover, the potential disequilibrium on the credit market does not matter. Finally, the distinction between reserves to deposits and extended reserves to deposits does not seem to be relevant. However, the paper uses country-level data covering several African countries. Thus, the results may be subject to heterogeneity concerns. The subsequent

[23] In our data, only two countries (Kenya and Nigeria) have explicit deposit insurance schemes. For an overview of deposit insurance schemes worldwide, see Demirgüç-Kunt *et al.* (2015).

models control for these aspects by introducing year and country fixed effects and errors clustered at the country level.

These methodological extensions prove to be pivotal for our results and underline the necessity to control for potential uncontrolled heterogeneity sources in international comparisons. A striking change in the previous results is that the volatility of deposits becomes non-significant for all specifications. Thus, fixed effects capture non-observable fixed factors previously captured by differences in deposits volatility levels. Such factors could e.g. encompass country level competition for deposits, stability of the economy and /or political institutions. Moreover, the skewness of deposits remains non-significant when considering the narrower *reserves to deposits* ratio. However, *skewness of deposits* becomes significant (at the 5% threshold) when considering the broader *Extended reserves to assets* ratio (Table 3.4, Model 4). As the liquidity risk measure is based on changes of total deposits, a larger skewness reflects a distributional asymmetry towards lower, indeed negative changes in deposits, i.e. outflows. Accordingly, a higher propensity to observe deposits outflows is associated to larger holdings of liquid assets. Thus, while the sole dispersion of deposits changes cannot be related neither to reserves nor to liquid assets holdings, banks facing more episodes of outflows than inflows hold more liquid assets. We may interpret this observation as the upholding of larger amounts of liquid assets by banks operating in conditions where deposits outflows are more frequent. Although a skewness measure does not precisely reflect the likelihood of a bank run to occur, our results nevertheless suggest that SSA banks may to some extent expand their liquid assets buffers to withstand repeated episodes of deposits outflows.

Considering now the disequilibrium indicator, we first note that while the OLS regressions do not allow concluding to the existence of any association of reserves with either the level

and the direction of the credit market disequilibrium, controlling for heterogeneity in levels and in error dispersion, we observe some original results. First, Table 3.3 shows that a larger disequilibrium (in the direction of an excess supply of credit) is associated with a larger *reserves to deposits* ratio. Model 4 in Table 3.3 further shows that this effect is indeed concentrated on country-years with an excess supply. This suggests that in times of excess supply, banks tend to hoard more liquidity, which we interpret as reflecting their inability or unwillingness to transform available deposits. Apart from the economic context, the lack of demand can be explained by the inability of firms to provide the necessary collateral to guarantee their loans. Indeed, in many SSA countries, borrowers fail to enter the credit market because they cannot satisfy banks requirements in terms of collateral (Beck *et al.,* 2011b). As consequences, usually only large firms have access to line of credit while SMEs struggle (Demirgüç-Kunt & Klapper, 2012)**.** For instance in CEMAC zone more than 70% of SMEs do not have access to credit market (BEAC and BCEAO, 2016). Besides, the concentration of banking infrastructures in urban area, as well as the importance of informal sector leads to lower potential demand for credit. Conversely, times of excess cannot be associated to larger reserves holdings. This last observation suggests that banks hold liquidity that meets their short-term needs, given their capitalization, the reserve requirements and other country- and time-related characteristics. Indeed, the claims on central banks are supposed to serve for banks short terms needs in terms of liquidity. Thus, even in case of excess demand, banks do not use those reserves for lending, in order to avoid situations of illiquidity.

Second, considering *Extended reserves to assets* (Table 3.4), Model 3 shows no association with the disequilibrium indicator, neither with the volatility or the skewness of deposits. However, disentangling between times of excess supply and excess returns highlights first

a negative association between the holding of liquid assets and the disequilibrium level in times of excess demand. Thus, banks tend to redirect towards the private sector a part of the liquid assets initially invested on government and non-resident assets. Yet, for the *reserves to deposits* ratio, we previously found that periods of excess demand have no link with cash holding with central banks. This suggests that banks preferably use non-cash liquid assets in order to extend credit in times of excess demand, given the propensity to face more likely deposits outflows (the *skewness* variable). Thus, the results confirm that the claims on central banks are used at short term to hedge against the liquidity risk, while the other liquid assets are available for lending in case of excess demand.

However, the fact that variations of neither cash reserves nor liquid assets are not associated to the aggregate volatility of deposits does not mean that SSA banks ignore liquidity management concerns. It could as well indicate that the deposits volatility levels recorded in the data are simply not considered as binding by bank managers given the regulatory minimum reserves requirements and the effective reserves and liquid assets levels. The observed asymmetry between reserves hoarding when demand is low but liquid assets divesting when demand is in excess could reflect a pecking-order type of liquidity management. Accordingly, banks would prefer first liquidating non-cash liquid assets to serve demand, keeping in mind that situations of excess supply are the norm. Conversely, they could be reluctant to decrease reserves to produce additional credit, still reflecting liquidity management concerns.

Within the estimates, we also control for the *equity to assets*, and the *reserves requirement rate*. Considering Models 3 and 4 from Table 3.3, we observe a negative association between bank capitalization and reserves holdings. This suggests that equity and reserves would rather act as substitutes than complements in the risk-management decisions of

commercial banks. However, this relationship disappears when we consider the extended reserves to assets ratio, suggesting that liquid assets holdings decisions are also driven by other considerations that risk management. Moreover, we observe unsurprisingly a positive association between reserves holdings and the reserves requirements. The weakness of the association may just reflect the country-level dimension of regulatory reserves requirements, mostly captured by country fixed-effects.

Table 3.3: Reserves to deposits

This table presents the estimates allowing explaining the hoarding of reserves in SSA banking industries. The dependent variable is the *reserves to deposits* ratio. First, the estimates are done using OLS with heteroscedasticity-consistent standard errors between brackets (Model 1, 2). Then we resort to regressions with both country and year fixed effects and clustered the standards errors at the country level (Models 3 & 4). *, **, *** denotes significance respectively at the 10%, 5% & 1% level.

	[1]	[2]	[3]	[4]
Disequilibrium Indicator	0.019		0.036**	
	(0.039)		(0.015)	
Excess Supply		0.031		0.046**
		(0.050)		(0.019)
Excess Demand		-0.034		0.007
		(0.139)		(0.086)
Volatility of Deposits	52.721***	52.780***	-0.414	-0.240
	(4.785)	(4.799)	(2.556)	(2.472)
Skewness of Deposits	0.005	0.006	-0.004	-0.004
	(0.008)	(0.009)	(0.004)	(0.004)
Equity to Assets	0.277	0.279	-0.539**	-0.530**
	(0.247)	(0.248)	(0.251)	(0.248)
Reserves Requirement Rate	0.637***	0.625***	0.452*	0.446*
	(0.146)	(0.150)	(0.259)	(0.257)
Intercept	-0.018	-0.020	0.153***	0.151***
	(0.034)	(0.035)	(0.031)	(0.032)
N	180	180	180	180
Country & Year FE	No	No	Yes	Yes
Country clusters	No	No	Yes	Yes
R^2	0.4228	0.4200		
QIC			173.85	174.777

Table 3.4: Extended reserves to assets

This table presents the estimates allowing explaining the hoarding of reserves in SSA banking industry. The dependent variable is the *extended reserves to assets*. First, the estimates are done using OLS with heteroscedasticity-consistent standard errors between brackets (Model 1, 2). Then we resort to regressions with both country and year fixed effects and clustered errors at the country level (Models 3 & 4). *, **, *** denotes significance respectively at the 10%, 5% & 1% level.

	[1]	[2]	[3]	[4]
Disequilibrium Indicator	0.019		0.010	
	(0.048)		(0.043)	
Excess Supply		0.044		0.097
		(0.061)		(0.083)
Excess Demand		-0.090		-0.245**
		(0.169)		(0.123)
Volatility of Deposits	18.303***	18.425***	1.367	2.914
	(5.832)	(5.844)	(8.654)	(8.850)
Skewness of Deposits	0.008	0.008	0.011	0.016**
	(0.010)	(0.010)	(0.008)	(0.008)
Equity to Assets	-0.041	-0.038	-0.603	-0.517
	(0.301)	(0.302)	(0.408)	(0.369)
Reserves Requirement Rate	0.846***	0.821***	-0.055	-0.109
	(0.178)	(0.182)	(0.272)	(0.294)
Intercept	0.314***	0.309***	0.500***	0.477***
	(0.042)	(0.042)	(0.044)	(0.044)
N	180	180	180	180
Country & Year FE	No	No	Yes	Yes
Country clusters	No	No	Yes	Yes
R^2	0.1464	0.1437		
QIC			180.986	182.271

3.5. Conclusion

In this paper, we explain one of the SSA banking industry paradox. Indeed, banks are hoarding a large amount of reserves, while the private sector struggles to find funding. The build-up of reserves by banks is likely driven by two key factors: the weakness of demand and the instability of deposits. Our results show that banks facing an insufficient credit demand hold more reserves the larger the imbalance, but do not necessarily hold more liquid assets. Conversely, banks operating in conditions where demand potentially exceeds supply hold fewer liquid assets the larger the imbalance but do not hold fewer cash reserves on average. This asymmetry could reflect a pecking-order type of liquidity management, banks preferring first liquidating non-cash liquid assets to serve demand, keeping in mind

that situations of excess supply are the norm. Nevertheless, the holding of liquid assets is related to the propensity to observe episodes of repeated withdrawals. Hence, SSA banks do not, on average, adjust their reserves and liquid assets to current fluctuations of deposits but incorporate the possibility of larger cumulated movements in the determination of their buffer of non-cash liquid assets.

Our results imply that policies that aim increasing the depth of credit markets should primarily focus on structural constraints limiting the ability of non-financial agents to access credit. Hence, the establishment of a better risk management framework as well as the softening of the conditions to access the credit market could allow banks to reinject the reserves in the economy, and therefore contribute to the emergence of a sustainable private sector. More specifically, the production and diffusion of verified information on borrowers, the supply and management of collateral, or the development of publicly supported guarantee schemes could help increasing the viable demand for credit. This also could suggest that banks are not the most adapted institutions in order to supply credit to some segments of the economy. This may explain the growth of microfinance institutions over the last two or three decades. This also questions the business model of African banks. In a context where banks are only able to serve a limited share of funding needs, the existence of deficiencies in the supply of credit may have consequences on the stability and profitability of commercial banks.

Appendix

Table 3.5: Time distribution of countries with excess supply

Years	Number of countries in the sample	Percentage in excess supply
2001	13	69.23%
2002	11	63.64%
2003	11	63.64%
2004	14	85.71%
2005	21	61.90%
2006	21	61.90%
2007	21	61.90%
2008	17	76.47%
2009	11	90.91%
2010	11	90.91%
2011	11	54.55%
2012	10	80.00%
2013	9	77.78%

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Chapitre 4 - The Impact of Business Model on Bank Performance and Stability

In this paper, we investigate the impact of business model on bank performance and stability, with a focus on net interest margins. Using a large sample of 300 commercial banks covering 46 African countries over the 2010-2018 period, we define the business model by the income structure. Overall, we find that the shift towards non-interest income is associated to a decrease in net interest margins. Besides, we observe limited if no impact on overall performance and stability on average. Thus, our results suggest that African banks do not clearly benefit from diversification. Moreover, our results show that small banks are harmed by a larger exposure to non-traditional banking activities. These findings suggest that small African banks lack experience and expertise when shifting towards non-interest income activities. The results show that ownership also matters. Indeed, financial institutions that enjoy some form of support, either from foreign shareholders or the State, may be able to take advantage from the expansion into non-interest income activities.

Keywords: Africa; Bank Business Model; Ownership; Net Interest Margins; Non-interest Income; Diversification; Performance; Stability.

JEL Classification: G21; G32; N27.

4.1. Introduction

In this chapter, we examine the impact of the changing business models of African banks on their performance and risk. Indeed, since the independences, African countries have experienced some deep changes in their financial systems. The decades following the independences were characterized by the financial liberalization and the integration of the continent in the international trade. During this period, there was a large expansion of foreign banks in the continent (Beck *et al*., 2014), reshaping the whole banking system. Since the 2000s, there has been a second wave of banks arriving on the continent, commonly referred as regional banks or Pan-African banks. These changes in ownership, in addition to the financial liberalization, led to the increase of competition in African banking systems (Léon, 2016). Consequently, banks are adapting their business models to the current environment by looking for new markets and activities, leading to a growing share of non-interest income in the total operating income**.** Indeed, the non-interest income share of African banks increased on average from 34% in 1996 to 43% in 2014 (Nguyen *et al*., 2016). Moreover, this share is higher than in most of developed and emerging countries (Stiroh, 2004; Lepetit *et al*., 2008a; Ahamed, 2017; Moudud-Ul-Huq *et al*., 2018). Besides, the high share of non-interest income of African banks could also be driven by the structural deficiencies of credit markets. Indeed, it has been documented that African banks may be reluctant to lend, making financial intermediation marginal comparing to other developing countries (Beck & Cull, 2014; Demirgüç-Kunt & Klapper, 2012), and therefore mechanically increasing the shift towards non-traditional banking activities like commissions and fees, insurance, and trading.

These changes in African banks' ownership structures and business models might have an impact on their overall performance and stability. Indeed, the mainly bank-based financial systems of African countries are characterized by the presence of four different types of banks: private domestic, State-owned, Pan-African, and Foreign, i.e. controlled by extra-African entities. As these institutions may have different access to resources, both human and financial, may benefit (or not) from government or external support, the type of ownership of a given bank may have a moderating effect on the link between diversification and performance or stability.

However, the literature analyzing banks either in developed or in developing countries is rather inconclusive about the link between the shift from financial intermediation to non-traditional banking and bank performance and/or stability, empirical results being often contradicting (Gallo *et al.,*1996; Stiroh, 2004; Lepetit *et al*., 2008a; Meslier *et al*., 2014; Saghi-Zedek, 2016). Moreover, there are only few papers which tackle the potential implications of banks income diversification on financial intermediation, i.e. on the quantity, terms, and profitability of credit. Among these, Lepetit *et al*. (2008b) show that a higher income share from commissions and fees tends to lower net margins and loans spreads. More specifically, banks with higher reliance on fee-based activities charge lower lending rates suggesting that they underprice loans in order to sell other services, namely non-traditional banking services. Similarly, Nguyen (2012) finds that involvement in non-traditional banking activities mainly decreases net interest margins. These results suggest that banks may manage their operating income by cross-selling and cross-subsidizing activities. Except those few papers, the literature in the field mainly focuses on the role of diversification on banks overall performance and stability.

By assuming that income structure reflects banks' business models (Köhler, 2015), we first focus on the link between income diversification and African banks' net interest margins (*NIM*). Second, following previous studies on banks' income diversification, we extend our approach and investigate the impact of income diversification on overall bank performance. However, the literature underlines that in some cases, the benefits in terms of performance associated with income diversification might be offset by an increase in risk. Therefore, we take our investigation further and check whether there is a "dark side of diversification" (Stiroh & Rumble, 2006) in African banking industry.

Overall, we find that while associated on average with lower net interest margins, income diversification has no impact on African banks performance. Thus, our results suggest that African banks do not benefit from income diversification. Moreover, we also observe the negative link between *NIM* and the shift towards other activities seen elsewhere. In this dimension, African markets exhibit a similar pattern as observed on more developed markets. However, we find that size and to a lesser extent ownership matter. In fact, small banks suffer from a decrease in overall performance (*RoA*), which suggests that they are not able to compensate the decreasing *NIM* with sufficient income from other non-traditional banking activities. Moreover, small banks expanding in non-traditional activities appear to be less stable, although the evidence is relatively weak, while larger banks rather gain in stability as they are more active in other banking activities than traditional intermediation. Regarding ownership, the evidence, although less robust than size effects, suggests that the benefits of diversification might be linked to the ownership type. More specifically, the observed negative link between performance levels and composition for smaller banks is generally less strong for banks with foreign (both African and extra-African) or government support.

Our paper has several contributions. First, the paper contributes to the extensive literature on bank diversification, but in the African context by accounting for the specificities of the region especially in terms of ownership. Second, while most of studies on the nexus income diversification – performance focus on the overall return, the paper highlights the implications on net interest margins. Lastly, our conclusions might be useful for regulators in terms of policy design regarding the growing shift of African banks towards non-traditional banking.

The remainder of the chapter is structured as follows. Section 4.2 reviews the literature on the relationship income structure and bank performance. The data and methodology are presented in section 4.3. We discuss the results in section 4.4, before concluding in section 4.5.

4.2. Literature review

The question of bank income diversification has been extensively studied, with a focus on the impact of such diversification on banks performance and stability. The literature mainly considers two theoretical channels in order to explain the hypothesized, positive or negative, relationships.

First, the expected improvement of bank profitability is commonly explained by the fact that by diversifying, banks combine several financial products leading to greater efficiency through economies of scope (Klein & Saidenberg, 1998). However, these economies of scope are sometimes reached by selling multiple products to the same core of customers. Thus, if diversification offer new streams of revenues on the one side, these revenues, on the other side might be exposed to the same shocks canceling the potential improvement in

profitability especially during periods of economy downturn or in case of changing customers preference (Stiroh & Rumble, 2006).

Second, the gain in stability (i.e. a lower risk) is first consistent with the diversification hypothesis underlined by portfolio theory. Indeed, by shifting from traditional banking to non-traditional banking activities, banks reduce their dependence on interest income through an increase in non-interest income, allowing to stabilize the overall operating income (Köhler, 2015). In addition, DeYoung & Roland (2001) identify three main mechanisms that may explain the effects of diversification on bank instability. First, because of high switching and information cost, borrowers and lenders are discouraged from cancelling the lending relationship, making the interest income stable over time. Conversely, non-interest income is instable because it is easier to switch banks in these kinds of activities. Second, as opposed to lending activities, the shifting towards non-interest income activities leads to additional fixed costs in terms of technological and human capital, consequently increasing banks operational leverage. Lastly, while diversifying, banks benefit from higher degree of financial leverage because regulators require no or little capital on non-interest income activities. Consequently, earnings volatility is likely to increase.

Indeed, several studies report that income diversification might be accompanied by benefits. Templeton & Severiens (1992) study the effects of income diversification on bank holding company risk. As predicted by the modern theory of portfolio, they find that diversification leads to lower variance of shareholders returns. Lee *et al*. (2014), considering the Asia-Pacific countries, also confirm the portfolio diversification hypothesis as they find that revenue diversification lead to greater stability and performance. Saunders & Walter (1994) by studying the shift towards universal banking in USA find that the

expansion to non-banking activities may lead to a potential risk reduction. Gallo *et al.* (1996) examine the impact of commercial banks mutual funds activities on both bank risk and profitability. In addition to increase profitability, their results show that mutual funds activities strengthen stability. Focusing on European banks, Köhler (2015) also finds that diversification can improve both stability and performance. In ASEAN[24] countries, Moudud-Ul-Huq *et al*. (2018) also show that diversification tends to lower bank risk, in addition to enhance performance. By using a larger sample covering 22 Asian countries, Lee *et al*. (2014) come to similar results when it comes to stability but find no effect regarding performance.

However, in some cases, the potential benefits associated with income diversification might be overshadowed by costs or by an increase in risk. Stiroh *et al.* (2004) weigh the potential benefits of diversification for US banks and find that non-interest activities are quite volatile. In the same vein, DeYoung & Roland (2001) also show that replacing lending by non-interest activities leads to an increase in earnings volatility. Concerning European banks, Lepetit *et al*. (2008a), by investigating the effects of products diversification on stability, find that banks which engage into non-interest income activities tend to be become riskier than those focusing on traditional banking. Some studies have focused on emerging and developing economies. Thus, in the specific case of China, Li & Zhang (2013) show that the non-interest income activities are riskier than traditional banking. Focusing on the Australian banking system, Williams (2016) finds no diversification benefit. Considering GCC[25] banks, Abuzayed *et al.* (2018) highlight that banks diversification strategies do not contribute to stability. Boadi (2018) is so far one of the very few papers focusing on African banking systems. Using a large data on 584 banks

[24] Association of Southeast Asian Nations
[25] Gulf Cooperation Council

covering 50 countries over the 2001-2013 period, he examines the impact of income diversification on performance. The results show a negative relationship between income diversification and banks performance suggesting that diversified African banks are less profitable.

The literature on bank income diversification mainly focuses on the impact on banks overall performance, typically measured by *RoA* or *RoE*. However, production and pricing decisions are unlikely to be independent management decisions. More specifically, loan and services pricing decisions could be linked given competition and market share objectives of banks. Accordingly, the analysis of diversification should not only focus on the level and types of non-interest income activities, but also on traditional intermediation. A common indicator of the potential profitability of intermediation are interest margins. However, few studies are dedicated to the impact of diversification on net interest margins. Among them, Lepetit *et al*. (2008b) examine how the trend toward stronger product diversification in European banking industry affects their net interest margins and loans pricing. The results show that a higher income share from commissions and fees tend to lower net margins and loans spreads. More specifically, banks with higher reliance on fee-based activities charge lower lending rates. These results seem to validate the "cross selling" or "loss leader" hypothesis, showing that banks misprice conscientiously loans to increase sales on other services namely non-traditional banking services. Nguyen (2012) also comes to similar conclusions. Indeed, by studying the relationship between net interest margins and non-interest income, evidence is found that involvement in non-traditional banking activities mainly decreases net interest margins.

Furthermore, the literature emphasizes that the impact of income diversification on bank performance and stability depends on several factors such as the type of non-interest income, bank size, and the type of bank ownership.

First, bank diversification cannot be simply handled like a portfolio management decision. It implies the building of new capabilities, the tying of considerable resources, and, more importantly, strategic choices about the type of activities to expand in. Thus, the impact of income diversification on bank performance and risk is likely to depend on the type of non-interest income. Indeed, Lepetit *et al*. (2008a) show that for EU banks, when expanding to non-traditional banking, the increase in risk is mainly induced by the commission and fee income. Focusing on Germany, Busch & Kick (2015) highlight that banks with a larger share of fee income are also characterized by a higher risk-adjusted returns on equity and assets. Also in Germany, Köhler (2014) finds that net fee and commission income play an important role on bank stability, while the influence of trading income is limited. Likewise, Lee *et al*. (2014) find that revenue diversification is beneficial for banks in Asia-Pacific countries, both in terms of risk and performance as long as the diversification is not limited to commissions only. Beyond fee and commission income, the results from Stiroh (2004) show that trading activities lead to higher risk and lower risk adjusted profits. Ahamed (2017) finds that for Indian banks, non-interest income leads to higher profitability, specifically in the case of trading activities. Furthermore, DeYoung & Torna (2013) examine the role of non-banking activities in the failure of US commercial banks during the financial crisis by considering separately financially healthy banks and distressed ones. Their results show that non-interest income activities such as investment banking, assets securitization, and venture capital tend to increase the probability of bank failure only for distressed ones, while securities brokerage, insurance sales, and loan servicing reduce the

probability regardless of the bank. In a nutshell, the type of non-interest income activity matters. Indeed, non-traditional banking activities like trading expose banks to market risk. Conversely, fee and commission activities expose bank to business risk due to competition and macro-economic factors. In this case, the capital equity is at risk only if the related fixed costs overshadow the sales revenues (DeYoung & Torna, 2013).

Besides, bank size, typically measured by total assets, may also moderate the relationship between diversification and performance or risk. Hidayat *et al*. (2012) study the relationship between products diversification and stability in the Indonesian banking industry. Their results show that the impact of diversification in bank risk varies according to size. More specifically, diversification tends to decrease the risk of small banks, while for large banks the instability increases. Conversely, Lepetit *et al*. (2008a) find in the case of European banks that smaller banks experience higher risk especially when diversification is mainly based on commissions and fees. However, they become safer when trading activities are the main component of non-interest income. Regarding large banks, they are less subject to product diversification. Still concerning European banks, Köhler (2015) shows that smaller and well capitalized ones are more stable in the case of diversification. Conversely, Mercieca *et al*. (2007) find no direct benefits for small banks from diversification, suggesting that those banks should focus and expand to their current business lines where they have a distinctive comparative advantages. However, in the case of Italian banking industry, Chiorazzo *et al*. (2008) highlight that small banks can benefits from diversification only if at the beginning they have a very little share of non-interest income.

Thus, small, medium and large banks are affected differently by non-interest income activities as their characteristics are different. In fact, small banks use to have smaller share

of non-interest income compared to larger banks, because they are retail-oriented with a focus on lending relationship. In this context and in accordance with the diversification hypothesis, by increasing their share of non-interest income, they might theoretically gain in stability due to a decrease in their dependence on interest income. When it comes to larger banks, they are well known as being investment-oriented with large share of non-interest income. Therefore, they might also gain additional benefits by diversifying. However, non-interest income activities are risky for small as well as large banks. Large banks are more subject to this instability due to their reliance to investment banking activities. But they usually have huge resources, in terms of technology and human capital, allowing them to deal with risk associated to non-interest income activities. Unlike large banks, smaller banks usually do not have the required experience and expertise in the field (Köhler, 2015; Mercieca *et al.*, 2007).

As diversification choices and the capacity to implement them successfully are management driven, ownership structure may also determine the links between diversification and performance or risk. Accordingly, Saghi-Zedek (2016) examines the role of shareholders categories on bank diversification strategies and the impact on bank risk and performance. The results show that ownership structure matters. More specifically, when banks have no controlling shareholders, or only families and states as controlling shareholders, the greater the diversification, the higher the risk and the risk default. Conversely, when the controlling shareholders are institutional investors, industrial firms and other banking institutions, the diversification lead to higher profitability, lower risk and lower default risk due to the fact that banks tend to enjoy additional skills from those investors. Moreover, Meslier *et al*. (2014) investigate the impact of income diversification on Philippine banks. The main results show that by expanding into non-interest activities,

banks increase their performance and risk-adjusted profit and especially when the shift is focused on trading of government securities. Besides, the benefits of such diversification are better for foreign banks compared to their domestic counterparts. Ahamed (2017) finds similar results by using a sample on Indian banks. Indeed, his results highlight that shifting towards non-traditional activities lead to higher profits mainly for foreign banks than private domestic and state-owned banks. Overall, the explanation is that foreign banks use to specialize in non-interest income activities. Indeed, in addition to their general lack of knowledge regarding the domestic market, they experience disadvantages in accessing to soft information essential in the lending relationship with small local firms (Stein, 2002; Berger & Udell, 2006). For instance, Nguyen *et al*. (2016) highlight that foreign banks in Africa resort more to non-traditional banking activities than their domestic counterparts. Concerning the effects of diversification, Boadi (2018) highlights that state-ownership does not matter. Indeed, by examining the impact of diversification on African banks performance, the results show the persistence of a negative relationship whether the bank is state-owned or not.

4.3. Econometric framework

Our sample consists in 300 commercial banks covering 46 African countries during the 2010-2018 period. The data are from Orbis Bank Focus. However, to build the ownership database, we also resort to data from websites and annual reports of banks and central banks. In addition to distinguish between ownership types, we also split the sample in 3 parts according to the size. We therefore identify small banks, medium banks and large banks. We define medium banks as banks ranged between the 25^{th} and 75^{th} percentile of the total assets. Banks with total assets above the 75^{th} percentile are considered as large. The remainder banks are therefore small. The following subsections document the variables used in the estimates, as well as the econometric approach.

4.3.1. Performance and risk measures

The paper investigates the impact of non-traditional banking activities on banks intermediation profitability, overall performance, and stability. Therefore, we first consider net interest margins (NIM) defined as the difference between interest income and interest expense, expressed in percentage of earning assets. Banks should pursuit high margins as long as asset quality is maintained. High net interest margins for banks mean that either funding is cheap, or that they are performing well in financial intermediation.

Moving to overall performance, following the literature, we use the Return on Assets (RoA) as a proxy for banks overall performance (Stiroh & Rumble, 2006; Meslier *et al.,* 2014; Saghi-Zedek, 2016). RoA is defined as the net income divided by the total assets.

Regarding stability, we side with the literature and use the Z-score as indicator of bank risk (Stiroh, 2004; Stiroh & Rumble, 2006; Laeven & Levine, 2009). The Z-score is commonly used in the literature as proxy for the overall baking stability as it accounts for the distance to default. Indeed, the Z-score can be defined as the number of standard deviations by which profits have to decrease in order to erase the bank equity given current performance, and therefore drive the bank into failure (Roy, 1952). Put differently, the Z-score is the inverse of the probability of bank insolvency: a higher Z-score indicates greater stability and a lower Z-score higher exposure to bankruptcy. Following Lepetit & Strobel (2013), we compute the Z-score as:

$$Z_{it} = \frac{RoA_i + CAR_{it}}{SDRoA_i}$$

Where: RoA is the Return on Assets measured by ratio of net income to total assets; CAR is the ratio of equity to total assets; $SDRoA$ is the standard deviation of RoA; i and t refers respectively to a given bank, and a given year. Therefore, the Z-score is computed by using the mean and standard deviation of RoA over the full sample period, combining by the current value of the capital ratio.

4.3.2. Ownership structure

It is well established that African banking systems are very specific in terms of ownership compared to other countries. Indeed, the continent has experienced several changes in ownership structure after the Structural Adjustment Programs (SAPs) of the International Monetary Funds (IMF) and the Word Bank (WB) over the 1980s. The following decades have been accompanied by a large expansion of foreign banks due to liberalization and

privatization reforms, but also the continent increasing integration in the international trade (Beck *et al*., 2014). Currently, several kinds of owners coexist in African countries: States, private domestic sector investors, and foreign investors. Then, concerning foreign investors, we can distinguish between African investors and non-African investors.

In this paper, we consider this specificity of African banking industries by accounting for the ownership dimension and its potential impact in shaping the relationship between income diversification and bank performance or stability. We focus on 4 types of bank according to their ownership: state-owned banks, private domestic banks, Pan-African banks, and foreign banks. By definition, a bank is state-owned if the Government is a majority shareholder or at least the first shareholder. The same principle applies to the 3 other types of ownership. At the difference of foreign banks, Pan-African banks are banks headquartered in African countries and operating across the continent. In terms of ownership, our sample is made up by 133 Pan-African banks, 79 foreign banks, 49 private domestic banks, and 41 state-owned banks (Table 4.1). In order to account for the ownership structure in the estimates, we set 4 dummies variables corresponding to the 4 types of ownership in the sample. For example, the variable STATE is a dummy variable taking 1 as value if the bank is state-owned, and 0 elsewise. The same principle applies to the others type of ownership leading to dummies variables PAB, FOREIGN, and PRIVATE respectively for Pan-African banks, foreign banks, and private domestic banks.

The role of the ownership in the choice of the bank business model, and therefore on bank performance and risk can be fundamental. Nguyen *et al*. (2016) highlight that in Africa, foreign banks resort more to non-traditional banking activities than their domestic counterparts, leading to higher non-interest income. Conversely, Pan-African banks focus on financial intermediation. Besides, the literature also documents that the behavior of

banks in terms of risk taking is different according to the ownership. Chen *et al*. (2017) find that in emerging economies, foreign banks take on more risk compared to domestic ones because of informational disadvantages, agency problems, contagion effects from parent banks, and disparities between their home and host markets.

Table 4.1: Ownership distribution

This table presents the distribution of the sample by ownership.

Ownership	Number of Banks
Pan-African Banks	133
Foreign Banks	79
Private Domestic Banks	49
State-Owned Banks	41
Total	**302**

4.3.3. Bank diversification and business models

The business model can be defined as the strategy by which an organization makes profit. Thus, the business model is supposed to identify the services to provide, the products to sell, the market to target. In banking, the business model refers to "what banks do and how they do it" (Cosma *et al*., 2017, p.133). The literature provides different ways to identify bank business models. Roengpitya *et al*. (2014) apply to balance sheet characteristics the statistical clustering algorithm proposed by Ward (1963) to identify the business model of 222 international banks. Hryckiewicz & Kozłowski (2017) proceed similarly by using the k-medoid clustering approach to characterize the business model of 458 systematically important banks from 65 countries. Indeed, this method allows clustering banks into groups according to their similarity in terms of assets and liabilities structure. In the same vein, Mergaerts & Vennet (2016) resort to factor analysis to identify the business model of 505 European banks over the 1998-2013 period. However, instead of using cluster analysis, some papers characterize banks business models by their income structure (Köhler, 2015;

Busch & Kick, 2015). In fact, the rationale is that as business model refers to the way banks make profit, therefore by analyzing the structure of their income, we are then able to identify their business models: What are they doing? How are they doing it?

In this paper, following Köhler (2015), we represent a bank's business model by its income structure. More specifically, we define the business model as the share of the net non-interest income in the net operating income (NON). The net operating income is the sum of the net non-interest income and the net interest income. In order to deepen insights, we also disaggregate the net non-interest income (Stiroh, 2004; Lepetit *et al.,* 2008a) into three parts: the net fee and commission income, the net trading income, and the other net operating income. The net fee and commission income is the difference between the fee and commission income, and fee and commission expense. Likewise, the net trading income is the difference between the trading income and the trading expense. The other net operating income is defined as any other net income gained from operating activities that cannot be designated as net fee and commission or net trading income. It includes for example the net income from insurance, real estate, or sale of loans and receivables. These sub-groups of the non-interest income are then defined as ratios by expressing them in terms of net operating income. Thus, we define COM as the ratio of net fee and commission income to net operating income; TRD the net trading income expressed in terms of net operating income; and $OTOP$ the share of other net operating income in the net operating income.

Descriptive statistics are presented in table 4.3, while more complete statistics by ownership and size categories are provided in Appendix, respectively tables 4.7 and 4.8. First, we observe that at the aggregate level, African banks resort largely to non-traditional

banking activities compared to other regions. Indeed, the share of the net non-interest income to net operating income (NON) is 47%, indicating that only 53% of African banks net operating income is provided by the financial intermediation. Previously, Nguyen *et al*. (2016) find a ratio of 43% in 2014. By comparison, Lepetit *et al*. (2008a) find on a sample of European commercial and cooperative banks from 1996 to 2002 that the share of non-interest income is only 34%. Recently, by using a sample on 15 European countries from 2002 to 2011, Köhler (2015) finds that the non-interest income represents on average 30% of the total income of European banks regardless of their specialization, and 40% when it comes to commercial banks. On a sample of 107 Indian banks over the 1998-2014 period, Ahamed (2017) reports 36% as the share of non-interest income in the total operating income. The importance of the non-interest income in African banks is at least partially consistent with the fact that financial intermediation used to be weak in this region (Beck & Cull, 2014; Demirgüç-Kunt & Klapper, 2012). By distinguishing according to the type of non-interest income, we observe that the shift towards non-traditional banking is mainly focused on fee and commission activities, and other operating activities. The trading activity is still marginal, consistent with the fact that African financial markets are still embryonic.

Second, by splitting the sample according to ownership, we observe that Pan-African banks have on average the most non-traditional banking-oriented business model (Table 4.7). Indeed, for those banks, the share of non-interest income is the highest with more than half of the total net operating income (53%). Besides, for foreign and private domestic banks, the diversification strategy is oriented towards fees and commissions, while state-owned banks and Pan-African banks are more focused on other operating activities such as insurance, real estate, sale of loans and receivables and investment receivables. However,

the differences remain small. Regardless of the ownership, the share of trading income is weak compared to the other kinds of income. Pan-African banks have the highest share (13%), suggesting that these banks are especially involved in the setting-up of African financial markets.

Third, by splitting the sample according to size and regardless the type of ownership, we notice that large and small banks both on average focus on financial intermediation (Table 4.8). Conversely, medium banks seem to be more willing to shift towards non-traditional banking. Indeed, the non-interest income represents around 52% of their total operating income. For small banks, the non-interest income is mainly from fees and commissions, while large and medium banks are focused on other activities. Concerning the trading income, medium and small banks have the highest share, while surprisingly large banks have relatively the lowest.

4.3.4. Empirical model

To test the impact of bank business model on net interest margins, overall performance, and stability, we estimate the following baseline model:

$$Y_{it} = \beta_0 + \beta_1 NON_{it} + \beta_2 FOREIGN_{it} + \beta_3 PAB_{it} + \beta_4 STATE_{it} + \beta_5 (NON * FOREIGN)_{it} + \beta_6 (NON * PAB)_{it} + \beta_7 (NON * STATE)_{it} + \delta B_{it} + u_i + v_t + \varepsilon_{it}$$

Where, Y is a measure of bank performance or stability namely the net interest margins (NIM), the Return on Assets (RoA) or the Z-score; NON is the share of net non-interest income in the net operating income, considered as a proxy for business model; $FOREIGN, PAB, STATE$ are dummies variables defined above, private domestic bank being the omitted category; B is a set of bank specific control variables; u_i are country fixed effects; v_t are time fixed effects; and lastly ε_{it} is the error term.

We run several regressions. First, the model is estimated at the aggregate level, that is on the full sample. Then, we split the sample into 3 parts distinguishing between small, medium and large banks as the impact of non-interest income on bank performance and stability might be different according to size (Mercieca *et al*., 2007; Köhler, 2015). Besides, we test the aggregate impact of business model on bank performance and risk by first using the ratio of net non-interest income to net operating income (NON) as proxy. Then, we disaggregate this indicator between commission and fee-based activities (COM), trading income activities (TRD), and activities other than fee and trading-based ($OTOP$) because as underlined by the literature, the type of non-interest income matters (Lepetit *et al*., 2008a; DeYoung & Torna, 2013).

The model is estimated using Generalized Linear Model (Nelder & Wedderburn, 1972) with both country and year fixed effects to account for potential unobserved heterogeneity. Within the regressions, we cluster the standard errors at the bank level. Following the literature, we control for a set of bank specific factors which might affect bank performance and stability. Thus, the natural logarithm of total assets (*SIZE*) is introduced to account for the systematic differences in bank size (Stiroh & Rumble, 2006; Lepetit *et al*., 2008a). The capital ratio (*CAR*) allows controlling for bank capitalization level (Saghi-Zedek, 2016). Lastly, we also consider the differences in liquidity by introducing the liquid assets ratio (*LIQUID*) in the regressions (Moudud-Ul-Huq *et al*., 2018).

Table 4.2: Definition of variables

This table provides a description of variables used in the paper.

Variables	Description	Sources
NIM	Net Interest Margins (NIM) = Net Interest Revenue / Interest-Earning Assets	Bank Focus
RoA	Return on Assets	Bank Focus
Z-SCORE	Proxy for overall bank stability	Authors estimates using Bank Focus database
NON	Ratio of net Non-Interest Income to Net Operating Income.	Authors estimates using Bank Focus database
COM	Ratio of net Commissions and fees to Net Operating Income	Authors estimates using Bank Focus database
TRD	Ratio of net Trading Income to Net Operating Income	Authors estimates using Bank Focus database
OTOP	Ratio of Other net Operating Income to Net Operating Income	Authors estimates using Bank Focus database
PAB	Dummy variable taking 1 if the bank is Pan-African	Bank Focus, Banks websites & Central Banks websites
FOREIGN	Dummy variable taking 1 if the bank is owned by foreign investors	Bank Focus, Banks websites & Central Banks websites
STATE	Dummy variable taking 1 if the bank is government-Owned	Bank Focus, Banks websites & Central Banks websites
PRIVATE	Dummy variable taking 1 if the bank is owned by domestic private investors.	Bank Focus, Banks websites & Central Banks websites
SIZE	Natural logarithm of Total Assets	Authors estimates using Bank Focus database
CAR	Ratio of Equity to Assets	Bank Focus
LIQUID	Ratio of Liquid Assets to total Assets	Bank Focus

Table 4.3: Descriptive statistics

This table reports descriptive statistics on variables used in the econometric approach. Variables definitions: NIM = net interest margins; RoA = Return on Assets; NON= ratio of net non-interest income to net operating income; COM= ratio of net commission and fee income to net operating income ;TRD = ratio of net trading income to net operating income; OTOP = ratio of other net operating income to net operating income; PAB = Pan-African Bank; FOREIGN, PAB, STATE and PRIVATE are ownership dummies; SIZE = Natural logarithm of Total Assets; CAR = Ratio of Equity to Assets; LIQUID = Ratio of Liquid Assets to total Assets. Except the dummy variables (FOREIGN, PAB, STATE and PRIVATE), all variables are expressed in percentage.

Variable	N	Mean	Std.	Min	Max
NIM	1421	5.377	3.444	-10.740	27.990
RoA	1421	1.240	2.604	-28.170	24.740
Z-SCORE	1421	27.034	25.628	-0.500	275.281
NON	1421	47.014	21.582	11.407	79.785
COM	1421	18.029	7.782	7.656	31.778
TRD	1421	10.466	8.091	0.160	24.314
OTOP	1421	17.791	17.920	-15.374	41.953
PAB	1421	0.436	0.496	0	1
FOREIGN	1421	0.277	0.447	0	1
STATE	1421	0.141	0.349	0	1
PRIVATE	1421	0.146	0.353	0	1
SIZE	1421	13.085	1.518	9.184	18.248
CAR	1421	13.343	8.678	0.780	94.970
LIQUID	1421	26.414	16.515	1.010	94.470

4.4. Results

4.4.1. Business models and performance

Our baseline results on net interest margins (*NIM*) are presented in Table 4.4. We first run the estimates for the whole sample (Models 1 & 2). Then, we split the sample into 3 parts according to the size. The regressions for small banks are presented in Models 3 & 4. Models 5 & 6 display the results for the medium banks, while the results for large banks are provided by Models 7 & 8. Regardless the sample, we first test the aggregate effect of non-interest income on net interest margins: the results are displayed by odd-numbered columns. Then, we distinguish between the types of non-interest income in even-numbered columns.

At the aggregate level, we find that African banks more engaged in non-traditional banking activities have also lower net interest margins as the coefficient of the non-interest income is negative and statistically significant at the 1% level. The results are robust regardless the size (Table 4.4, Models 1 to 8). These results are in line with Nguyen (2012) who mainly finds a negative and statistically significant relationship between net interest margins and non-interest income on a sample of commercial banks from financially liberalized countries. At first sight, we could assume that banks are abandoning the financial intermediation in favor of non-traditional banking. However, we have to be cautious with this explanation as this negative relationship between non-interest income and net interest margins does not necessary mean that banks are leaving the traditional banking (Boyd *et al*., 1994). Rather, one explanation could be that banks are expanding towards non-interest income activities in order to compensate the decline in net interest margins induced by the increase of competition in recent years (Léon, 2016). Besides, the negative effect on net interest margins is consistent with the cross selling and loss leader hypotheses (Lepetit *et al*., 2008b). In fact, one can assume that African banks are deliberately underpricing loans in order to increase sales on non-traditional banking activities. Model 2 then disaggregates the NON in its three components in the same manner than Stiroh (2004). For the whole sample, we get negative parameters for the *COM*, *TRD*, and *OTOP* variables. Thus, regardless the type of non-traditional activity, any increase in income diversification is associated to a decrease in *NIM*. Furthermore, splitting the sample in size classes shows that this result is mainly associated to small banks. More precisely, the effects associated to the *COM* variable are non-significant (resp. weak) for medium (resp. large) banks. Adopting the cross selling and loss leader hypotheses, this suggests that these banks are able to expand fee income without altering their *NIM*. Further, the negative relationship between *NIM* and *NON* for medium and large banks appears to be mainly attributable to

OTOP activities (Models 6 and 8, Table 4.4). Given the absence of an obvious link between credit production and *OTOP* generating activities, there is no straightforward explanation for this seemingly robust result. However, a tentative rationale could be a widespread behavior of cross-subsidization across activities.

We then investigate the role of ownership in this relationship between non-interest income and net interest margins by first interacting the ownership dummies with the NON variable. Private domestic ownership is the omitted category. We find that compared to private domestic banks, foreign banks, Pan-African banks and state-owned banks engaging to non-traditional banking activities have relatively larger (i.e. possibly less lower) net interest margins suggesting that ownership matters. Thus, private domestic banks are at a disadvantage when having more expanded operations towards non-traditional activities. However, as previously, this result is concentrated on small banks (Model 3, Table 4.4). We observe a similar pattern for State controlled and foreign large banks, but the effect is statistically weak (Model 7, Table 4.4). Further decomposing the effects by interacting the NON components with the ownership types does not yield conclusive results. The few significant parameters are all linked to *OTOP* income, suggesting that private domestic banks are again at a disadvantage in these activities, which may request resources that are more accessible to institutions backed-up by larger ownership or institutional networks.

To summarize, we observe that smaller and private domestic banks, which we to some extent expect to be the same, with a larger share of non-interest income have on average smaller net interest margins than larger and/or foreign or State-controlled banks. This suggests that the former pursue non-traditional activities at the expense of lower margins, while the other banks either benefit from some pricing power on the credit market or from some group related support allowing maintaining stable credit margins.

Table 4.4: Impact of business models on Net Interest Margins (NIM)

This table show the fixed effects regressions of income diversification on banks net interest margins. The standard errors, clustered at the bank level, are presented between parentheses. Besides considering the full sample, we distinguish between small, medium and large banks. In odd-numbered columns we test the aggregate effect of expanding to non-interest income activities on net interest margins. Then, in even-numbered columns we disaggregate the non-interest income into commission and fee income, trading income, and other operating income. ***, **, * indicate statistical significance at the 1%, 5% and 10% level, respectively. NON= ratio of net non-interest income to net operating income; COM= ratio of net commission and fee income to net operating income; TRD = ratio of net trading income to net operating income; OTOP = ratio of other net operating income to net operating income; PAB = Pan-African Bank. FOREIGN, PAB, STATE are ownership dummies. Private domestic bank (PRIVATE) is the omitted category.

	Full Sample		**Small Banks**		**Medium Banks**		**Large Banks**	
	[1]	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**	**[8]**
Constant	10.105***	9.012***	9.796	6.284	6.540**	4.639	16.9***	16.868***
	(1.907)	(2.315)	(6.512)	(5.669)	(2.885)	(4.128)	(4.91)	(4.915)
NON	-0.091***		-0.111***		-0.072***		-0.144***	
	(0.016)		(0.023)		(0.021)		(0.052)	
COM		-0.062*		-0.122**		0.012		-0.197*
		(0.034)		(0.051)		(0.090)		(0.119)
TRD		-0.105**		-0.252***		0.016		-0.099
		(0.042)		(0.067)		(0.096)		(0.108)
OTOP		-0.091***		-0.089**		-0.086*		-0.162***
		(0.023)		(0.04)		(0.045)		(0.048)
FOREIGN	-1.330	0.921	-1.844	3.257	0.130	2.577	-3.988	-1.955
	(1.187)	(1.971)	(2.512)	(5.097)	(1.132)	(2.534)	(2.519)	(3.217)
PAB	-1.651*	-0.277	-3.825***	-3.922**	-0.095	2.222	-0.334	-0.923
	(0.867)	(1.076)	(1.157)	(1.691)	(1.077)	(2.419)	(2.406)	(2.669)
STATE	-1.428	-0.330	-5.228	-6.891	1.237	4.209	-3.679	-3.556
	(1.118)	(1.270)	(3.242)	(5.007)	(1.533)	(2.938)	(2.419)	(2.821)
NONxFOREIGN	0.048**		0.078*		0.024		0.104*	
	(0.023)		(0.044)		(0.022)		(0.054)	
NONxPAB	0.04**		0.086***		0.017		0.035	
	(0.017)		(0.025)		(0.020)		(0.052)	
NONxSTATE	0.040**		0.191**		-0.001		0.098*	
	(0.020)		(0.081)		(0.027)		(0.052)	
COMxFOREIGN		-0.049		-0.097		-0.066		0.0105
		(0.067)		(0.167)		(0.096)		(0.140)
TRDxFOREIGN		-0.026		-0.111		-0.060		-0.099
		(0.066)		(0.159)		(0.109)		(0.111)
OTOPxFOREIGN		0.060**		0.061		0.042		0.176***
		(0.027)		(0.045)		(0.048)		(0.055)
COMxPAB		-0.0004		0.095		-0.046		0.084
		(0.037)		(0.062)		(0.092)		(0.114)
TRDxPAB		-0.027		0.103		-0.111		-0.024
		(0.044)		(0.070)		(0.099)		(0.104)
OTOPxPAB		0.060**		0.053		0.044		0.057
		(0.023)		(0.040)		(0.046)		(0.054)
COMxSTATE		-0.020		0.252		-0.133		0.103
		(0.048)		(0.192)		(0.107)		(0.121)
TRDxSTATE		0.066		0.307		-0.129		0.117
		(0.066)		(0.248)		(0.132)		(0.115)
OTOPxSTATE		0.037		0.127		0.044		0.114**
		(0.032)		(0.126)		(0.052)		(0.052)
Control Variables	YES	YES	YES	YES	YES	YES	YES	YES
Country FE	YES	YES	YES	YES	YES	YES	YES	YES
Years FE	YES	YES	YES	YES	YES	YES	YES	YES
Firm Clusters	YES	YES	YES	YES	YES	YES	YES	YES
Number of Clusters	300	300	107	107	173	173	84	84
QIC	1614.886	1674.925	428.307	460.208	873.575	913.378	456.467	477.736
N	1421	1421	356	356	708	708	357	357

In addition to investigating the link between the business model and net interest margins, we also examine the link with overall performance by using the return on assets as dependent variable. Indeed, the negative association between the weight of *NON* and *NIM* could lead to a decrease in return if non-traditional activities do not compensate the lower *NIM*. The results are provided in Table 4.5. On the full sample, expanding to non-traditional banking activities has no link with the overall performance of African banks, the *NON* variable being statistically insignificant (Table 4.5, Model 1). Then, in Model 2, we disaggregate the *NON* by testing the individual effects of the commission and fee, trading, and other operating income activities on the overall performance. For the whole sample, we get a significant negative coefficient associated to the *COM* variable, while the other components of *NON* remain insignificant. Associated to the previously observed negative link between the share of commissions and fees and net interest margins (see Table 4.4), these results suggest that, on average, the expansion into financial services is achieved at the cost of less profitable intermediation and less overall profitability. However, further disaggregation into size classes shows that, similarly to the analysis of *NIM*, this effect is concentrated on small banks (Model 3 and 4, Table 4.5). Moreover, small banks with a higher share of trading income appear also to be less profitable. This confirms the previous observation that smaller banks may face difficulties when diversifying in terms of capabilities, access to resources and markets. Overall, these results are in line with Mercieca *et al*. (2007) who reach similar conclusions on a sample of small European banks. One explanation might be that during the diversification process, small banks enter new markets where they necessary do not have the required expertise and experience. In contrast, medium and larger banks overall performance are not impacted by income diversification (Table 4.5, Models 5 to 8).

Regarding ownership, results are again mainly concentrated on small banks. Having controlled for income structure (Model 4, Table 4.5), it appears that all non-private domestic banks (i.e. Pan-African, foreign, and state-owned banks) are on average less profitable than private domestic institutions. However, this effect is partially compensated by some significant interaction terms between ownership types and *NON* components. More specifically, the *COM*xForeign, *COM*x*PAB*, and *TRD*x*PAB* dummies have a significant positive parameter when considering small banks. Hence, being either a foreign or a Pan-African bank is associated to a marginally better performance given a deeper involvement in fee income and trading activities. However, most of the interaction terms remain insignificant, limiting the conclusions about the interplay between income structure and ownership type.

In a nutshell, it appears that income diversification is rather associated to a lesser *RoA* for small banks. Conversely, there is no robust evidence of a link between diversification and profitability for medium and large banks, even when controlling for the ownership type, as most variables in Models 5 to 8 remain insignificant. Again, a negative size effect impacts small banks, possibly reflecting the structural difficulties smaller institutions face when expanding in non-traditional activities.

Table 4.5: Impact of business models on Return on Assets (RoA)

This table show the fixed effects regressions of income diversification on banks return on assets. The standard errors, clustered at the bank level, are presented between parentheses. Besides considering the full sample, we distinguish between small, medium and large banks. In odd-numbered columns we test the aggregate effect of expanding to non-interest income activities on return on assets. Then, in even-numbered columns we disaggregate the non-interest income into commission and fee income, trading income, and other operating income. ***, **, * indicate statistical significance at the 1%, 5% and 10% level, respectively. NON= ratio of net non-interest income to net operating income; COM= ratio of net commission and fee income to net operating income; TRD = ratio of net trading income to net operating income; OTOP = ratio of other net operating income to net operating income; PAB = Pan-African Bank. FOREIGN, PAB, STATE are ownership dummies. Private domestic bank (PRIVATE) is the omitted category.

	Full Sample		**Small Banks**		**Medium Banks**		**Large Banks**	
	[1]	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**	**[8]**
Constant	-4.367**	-1.515	-15.696**	-12.082*	-8.020***	-5.710*	-6.005*	-5.667
	(1.741)	(1.704)	(7.403)	(6.564)	(2.584)	(3.149)	(3.638)	(3.664)
NON	-0.019		-0.071**		0.007		0.039	
	(0.013)		(0.035)		(0.017)		(0.029)	
COM		-0.074***		-0.234***		0.0263		0.003
		(0.025)		(0.049)		(0.046)		(0.049)
TRD		-0.046		-0.207***		-0.008		0.038
		(0.028)		(0.066)		(0.044)		(0.060)
OTOP		0.004		-0.016		0.019		0.047
		(0.018)		(0.044)		(0.020)		(0.036)
FOREIGN	-0.030	-0.490	-0.875	-4.107***	0.880	2.378	0.524	0.681
	(0.632)	(0.656)	(1.278)	(1.490)	(1.232)	(1.639)	(1.637)	(1.768)
PAB	-1.467**	-1.459	-4.524***	-8.968***	-0.542	1.020	1.080	0.693
	(0.727)	(0.975)	(1.525)	(3.016)	(1.310)	(1.820)	(1.626)	(1.697)
STATE	-1.687**	-1.809**	-4.257**	-9.461**	1.724	3.288*	-0.155	-0.265
	(0.746)	(0.762)	(1.902)	(4.831)	(1.348)	(1.892)	(1.616)	(1.653)
NONxFOREIGN	0.023		0.063*		-0.010		-0.016	
	(0.014)		(0.038)		(0.019)		(0.030)	
NONxPAB	0.025*		0.061		0.008		-0.029	
	(0.014)		(0.037)		(0.019)		(0.028)	
NONxSTATE	0.036**		0.124**		-0.028		-0.025	
	(0.015)		(0.063)		(0.021)		(0.031)	
COMxFOREIGN		0.032		0.259***		-0.104**		-0.009
		(0.034)		(0.076)		(0.049)		(0.055)
TRDxFOREIGN		0.061*		0.101		-0.012		-0.012
		(0.032)		(0.076)		(0.049)		(0.066)
OTOPxFOREIGN		0.016		0.034		-0.004		-0.023
		(0.018)		(0.048)		(0.023)		(0.038)
COMxPAB		0.019		0.209***		-0.073		0.011
		(0.035)		(0.074)		(0.051)		(0.054)
TRDxPAB		0.035		0.231**		0.008		-0.063
		(0.036)		(0.090)		(0.051)		(0.058)
OTOPxPAB		0.030		0.028		0.006		-0.020
		(0.019)		(0.048)		(0.028)		(0.037)
COMxSTATE		0.028		0.246		-0.142**		-0.010
		(0.032)		(0.184)		(0.062)		(0.052)
TRDxSTATE		0.092**		0.578		-0.043		0.029
		(0.037)		(0.370)		(0.060)		(0.064)
OTOPxSTATE		0.0261		0.134		-0.003		-0.037
		(0.019)		(0.127)		(0.026)		(0.040)
Control Variables	YES	YES	YES	YES	YES	YES	YES	YES
Country FE	YES	YES	YES	YES	YES	YES	YES	YES
Years FE	YES	YES	YES	YES	YES	YES	YES	YES
Firm Clusters	YES	YES	YES	YES	YES	YES	YES	YES
Number of Clusters	300	300	107	107	173	173	84	84
QIC	1551.229	1563.145	392.967	401.306	817.554	818.299	439.770	445.216
N	1421	1421	356	356	708	708	357	357

4.4.2. Business model and stability

In a last set of regressions, we investigate whether the choice of business model has an impact on the stability of African banks. The Z-score is used as measure of bank stability. The results are presented in Table 4.6 and confirm the previous discussions. First, we find on the full sample that shifting towards non-interest income activities has no effect on African banks stability. Indeed, the variable non-interest income is statistically non-significant (Table 4.6, Model 1). This result is quite different from most of studies in the field. Indeed, income diversification is usually found to be beneficial (Köhler, 2015; Lee *et al*., 2014; Moudud-Ul-Huq *et al*., 2018) or harmful (Lepetit *et al*., 2008; Li & Zhang, 2013; Williams, 2016) for banks in terms of risk. Regarding the type of non-interest income activities, we get weak evidence that only African banks engaging to business lines that generate commission and fee income tend to be riskier (Table 4.6, Model 2). This would be consistent with the observation that fee income could be more volatile than traditional intermediation (Lepetit et al., 2008a), hence lowering income stability as captured by the Z-score.

Considering size effects, only large banks increase their stability when diversifying (Table 4.6, Model 7). We find no direct effect for small and mediums banks (Table 4.6, Models 3 & 5). The explanation might be that, at the difference of medium and small banks, large banks are assumed to have the expertise and experience required for entering these new markets. In terms of size, small banks experience instability when they expand to business lines other than trading (Table 4.6, Model 4). Large banks are also risky when they shift towards activities related to trading income. This finding is consistent as trading activities are more volatile because they expose banks directly to market risk (DeYoung & Torna, 2013). However, large can reduce this instability by diversifying in activities such as

insurance, real estate, or sale of loans and receivables (Table 4.6, Model 8). The type of non-traditional banking activity does not matter for medium banks as we find that they are non-sensitive to the 3 kinds of non-interest income tested in the paper (Table 4.6, Model 6).

By accounting for the ownership, the results on the full sample show that compared to private domestic banks, only state-owned banks benefit from diversification by reducing their risk (Table 4.6, Model 1). These findings are also valid for small state-owned banks (Table 4.6, Model 3). By contrast, large foreign and state-owned banks engaging to non-traditional banking become riskier as their distance to default decreases (Table 4.6, Model 7). Then, we also interact the type of non-interest income with the ownership dummies. First, on the full sample, we find that state-owned banks involving to activities that generate trading income are riskier compared to private domestic banks. However, they can reduce such instability by focusing on activities other than fee and trading income based (Table 4.6, Model 2). Second, small state-owned banks shifting towards activities other than trading benefit from diversification by reducing their risk compared to private domestic banks. Meanwhile, small foreign banks focusing on trading activities become more instable (Table 4.6, Model 4). Third, on medium banks, the results show that only state-owned banks expanding to activities other than trading and fee income generating improve their stability compared to private domestic banks (Table 4.6, Model 6). And lastly, regarding the sample of large banks, foreign banks shifting towards trading income activities are likely to improve their stability relatively to Private domestic banks. By contrast, foreign and state-owned banks engaging to activities such as insurance, real estate tend to become riskier (Table 4.6, Model 8).

In a nutshell, the results about stability appear to be in line with the results considering profitability. Smaller banks more expanding in non-traditional banking are also less stable. On the other hand, larger banks diversifying in other activities (*OTOP*) seem to be able to benefit from more stable income sources which are overall associated to increased stability. Moreover, state-owned banks appear to some extent marginally less stable than their counterparts. However, the systematic interaction between activities and ownership, controlling for size, does not lead to robust consistent results.

Table 4.6: Impact of business models on bank stability: Z-score

This table show the fixed effects regressions of income diversification on Z-score. The standard errors, clustered at the bank level, are presented between parentheses. Besides considering the full sample, we distinguish between small, medium and large banks. In odd-numbered columns we test the aggregate effect of expanding to non-interest income activities on banks stability. Then, in even-numbered columns we disaggregate the non-interest income into commission and fee income, trading income, and other operating income. ***, **, * indicate statistical significance at the 1%, 5% and 10% level, respectively. NON= ratio of net non-interest income to net operating income; COM= ratio of net commission and fee income to net operating income TRD = ratio of net trading income to net operating income; OTOP = ratio of other net operating income to net operating income; PAB = Pan-African Bank. FOREIGN, PAB, STATE are ownership dummies. Private domestic bank (PRIVATE) is the omitted category.

	Full Sample		**Small Banks**		**Medium Banks**		**Large Banks**	
	[1]	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**	**[8]**
Constant	-44.859**	-30.103	8.834	73.864	-82.470*	-79.7885	-50.487	-56.772
	(19.875)	(21.240)	(67.202)	(72.312)	(48.696)	(48.964)	(41.431)	(41.324)
NON	-0.119		-0.398		-0.159		0.433*	
	(0.122)		(0.248)		(0.195)		(0.243)	
COM		-0.604*		-1.033**		-0.904		0.524
		(0.321)		(0.425)		(0.738)		(0.745)
TRD		-0.215		0.623		-0.762		-0.932*
		(0.367)		(0.553)		(0.686)		(0.531)
OTOP		0.022		-0.704**		0.079		0.996**
		(0.190)		(0.356)		(0.285)		(0.460)
FOREIGN	6.683	-0.559	9.317	18.802	-2.599	-14.010	18.047	14.294
	(10.423)	(12.871)	(21.825)	(33.476)	(12.871)	(19.080)	(15.995)	(18.581)
PAB	-8.096	-4.997	-10.147	2.0303	-20.539*	-30.308	7.468	9.707
	(8.645)	(11.400)	(12.012)	(16.319)	(11.925)	(20.029)	(16.256)	(17.551)
STATE	-12.713	-11.469	-65.368***	-49.085**	-27.259	-23.461	13.061	18.679
	(9.144)	(11.750)	(17.384)	(21.907)	(16.970)	(20.972)	(13.917)	(15.759)
NONxFOREIGN	-0.102		0.145		-0.05		-0.607**	
	(0.190)		(0.389)		(0.225)		(0.266)	
NONxPAB	0.088		0.219		0.232		-0.325	
	(0.151)		(0.290)		(0.200)		(0.282)	
NONxSTATE	0.340*		2.315***		0.364		-0.416*	
	(0.196)		(0.448)		(0.357)		(0.250)	
COMxFOREIGN		0.388		0.640		0.645		-0.259
		(0.480)		(0.984)		(0.812)		(0.883)
TRDxFOREIGN		-0.207		-1.856*		-0.466		1.859***
		(0.470)		(0.994)		(0.789)		(0.635)
OTOPxFOREIGN		-0.131		0.678		0.072		-1.522***
		(0.260)		(0.416)		(0.350)		(0.501)
COMxPAB		0.063		-0.072		0.564		-0.364
		(0.410)		(0.657)		(0.794)		(0.855)
TRDxPAB		-0.018		-0.403		0.549		0.424
		(0.402)		(0.596)		(0.752)		(0.579)
OTOPxPAB		0.0315		0.359		0.252		-0.513
		(0.227)		(0.404)		(0.310)		(0.506)
COMxSTATE		0.647		1.957**		0.482		-0.562
		(0.491)		(0.922)		(0.861)		(0.790)
TRDxSTATE		-0.896*		0.805		-1.420		0.814
		(0.529)		(1.565)		(0.896)		(0.733)
OTOPxSTATE		0.441*		2.695***		0.826**		-0.952**
		(0.250)		(0.823)		(0.405)		(0.459)
Control Variables	YES	YES	YES	YES	YES	YES	YES	YES
Country FE	YES	YES	YES	YES	YES	YES	YES	YES
Years FE	YES	YES	YES	YES	YES	YES	YES	YES
Firm Clusters	YES	YES	YES	YES	YES	YES	YES	YES
Number of Clusters	300	300	107	107	173	173	84	84
QIC	1653.750	1678.545	423.406	426.925	910.851	930.064	491.546	493.748
N	1421	1421	356	356	708	708	357	357

4.5. Conclusion

Over the last decades, African banking industry underwent several changes. The importance of foreign (mostly European) banks, the persistence of State-controlled financial institutions, and, more recently, the breakthrough of regional African banks has modified bank business models by leading to a growing share of non-interest income in total operating income. In this paper, we focus on the impact of business models, defined by income structure, on African banks net interest margins, overall performance, and stability.

Overall, we find that the shift towards non-interest income is associated to a decrease in net interest margins. Besides, we observe limited if no impact on overall performance and stability on average. Thus, our results suggest that African banks do not benefit from diversification. Moreover, our results show that small banks are harmed by a larger exposure to non-traditional banking activities, as the decreasing interest margins are accompanied by deteriorated performance and, to a lesser extent, stability indicators. These findings suggest that conversely to larger banks, small African banks lack experience and expertise when shifting towards non-traditional banking activities. The results show that ownership also matters. Indeed, financial institutions that enjoy some form of support, either from foreign shareholders or the State, may be able to take advantage from the expansion into non-traditional activities, or at least to be less exposed to the resulting difficulties and impacts on performance and stability.

Our findings have implications for banks as well as for regulators. Indeed, at the aggregate level, while worsening the net interest margins, income diversification has no impact on African banks overall performance and stability. Therefore, these results suggest that

African banks are overall able to provide non-traditional banking services without structurally strengthening their performance and stability. However, a particular attention should be paid to smaller institutions, which may lack the required resources to manage successfully those activities. Our results also show that, beside size, the ability to benefit from external (i.e. foreign) or State-support may help to overcome the difficulties resulting from the expansion into non-traditional activities. These results raise the question of the incentives that could be provided to smaller institutions to strengthen their position, *e.g.* through consolidation, in order to be able to tackle the issues resulting from diversification.

Appendix

Table 4.7: Income structure by ownership

This table provide descriptive statistics on African banks income structure by ownership. NET = ratio of net interest income to net operating income; NON= ratio of net non-interest income to net operating income; COM= ratio of net commission and fee income to net operating income; TRD = ratio of net trading income to net operating income; OTOP = ratio of other net operating income to net operating income. All variables are expressed in percentage.

	NET	NON	COM	TRD	OTOP
Aggregate					
Mean	**52.986**	**47.014**	**18.029**	**10.466**	**17.791**
Std	21.582	21.582	7.782	8.091	17.920
Min	20.215	11.407	7.656	0.160	-15.374
Max	88.593	79.785	31.778	24.314	41.953
State-owned					
Mean	**58.440**	**41.560**	**16.957**	**6.056**	**18.313**
Std	17.532	17.532	7.561	6.553	13.590
Min	20.215	11.407	7.656	0.160	-15.374
Max	88.593	79.785	31.778	24.314	41.953
Pan-African					
Mean	**46.837**	**53.163**	**19.217**	**12.881**	**20.498**
Std	21.127	21.127	7.894	8.147	18.821
Min	20.215	11.407	7.656	0.160	-15.374
Max	88.593	79.785	31.778	24.314	41.953
Foreign					
Mean	**58.595**	**41.405**	**16.196**	**9.724**	**14.351**
Std	21.371	21.371	7.159	7.707	18.186
Min	20.215	11.407	7.656	0.160	-15.374
Max	88.593	79.785	31.778	24.314	41.953
Private Domestic					
Mean	**55.458**	**44.542**	**18.989**	**8.925**	**15.705**
Std	22.206	22.206	8.029	7.559	17.069
Min	20.215	11.407	7.656	0.160	-15.374
Max	88.593	79.785	31.778	24.314	41.953

Table 4.8: Income structure by size

This table provide descriptive statistics on African banks income structure by ownership. NET = ratio of net interest income to net operating income; NON= ratio of net non-interest income to net operating income; COM= ratio of net commission and fee income to net operating income; TRD = ratio of net trading income to net operating income; OTOP = ratio of other net operating income to net operating income. All variables are expressed in percentage.

	NET	NON	COM	TRD	OTOP
Aggregate					
Mean	**52.986**	**47.014**	**18.029**	**10.466**	**17.791**
Std	21.582	21.582	7.782	8.091	17.920
Min	20.215	11.407	7.656	0.160	-15.374
Max	88.593	79.785	31.778	24.314	41.953
Large					
Mean	**56.028**	**43.972**	**16.377**	**7.287**	**20.149**
Std	18.910	18.910	6.493	7.209	13.216
Min	20.215	11.407	7.656	0.160	-15.374
Max	88.593	79.785	31.778	24.314	41.953
Medium					
Mean	**48.343**	**51.657**	**17.678**	**11.706**	**21.391**
Std	20.348	20.348	7.690	7.984	16.829
Min	20.215	11.407	7.656	0.160	-15.374
Max	88.593	79.785	31.778	24.314	41.953
Small					
Mean	**59.169**	**40.831**	**20.383**	**11.188**	**8.266**
Std	24.277	24.277	8.581	8.309	20.567
Min	20.215	11.407	7.656	0.160	-15.374
Max	88.593	79.785	31.778	24.314	41.953

Table 4.9: Pearson correlation matrix

NIM = net interest margins; RoA = Return on Assets; NON= ratio of net non-interest income to net operating income; COM= ratio of net commission and fee income to net operating income ;TRD = ratio of net trading income to net operating income; OTOP = ratio of other net operating income to net operating income; SIZE = Natural logarithm of Total Assets; CAR = Ratio of Equity to Assets; LIQUID = Ratio of Liquid Assets to total Assets.

		1	2	3	4	5	6	7	8	9	10
1	NIM	1									
2	RoA	0.142	1								
3	Z-SCORE	-0.039	0.152	1							
4	NON	-0.457	0.043	-0.103	1						
5	COM	0.087	-0.153	-0.054	0.083	1					
6	TRD	-0.256	0.026	-0.091	0.458	-0.238	1				
7	OTOP	-0.473	0.146	-0.060	0.880	-0.157	0.225	1			
8	SIZE	-0.226	0.236	0.012	0.023	-0.155	-0.204	0.211	1		
9	CAR	0.312	-0.159	0.199	-0.220	0.020	-0.059	-0.261	-0.401	1	
10	LIQUID	0.003	0.067	0.009	-0.066	0.011	-0.102	-0.051	0.117	0.001	1

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Conclusion Générale

Le système bancaire africain a connu des mutations profondes au cours des dernières décennies. Si des avancées significatives sont à noter, les banques africaines demeurent néanmoins confrontées à un cadre institutionnel peu favorable. Dans ce contexte, la thèse contribue à une meilleure compréhension des conditions d'exercice des banques africaines.

Le chapitre 2 montre ainsi de quelle manière la fonction d'intermédiation des banques africaines est contrainte par le contexte institutionnel dans lequel elles évoluent. En effet, nos résultats montrent que l'établissement d'un cadre institutionnel favorable au respect des obligations contractuelles et à la protection des créanciers et des emprunteurs est de nature à augmenter la capacité technique des banques à produire du crédit.

Par ailleurs, l'une des conséquences de ces contraintes qui pèsent sur l'activité des banques africaines est la détention de niveaux élevés de réserves. Parallèlement, l'accès au marché du crédit reste un défi pour les agents non-financiers. Alors que la littérature a tendance à attribuer cette accumulation de réserves au risque de liquidité encouru par les banques africaines, nous montrons dans le chapitre 3 que ce paradoxe est notamment le reflet d'une faible demande structurelle du crédit. En effet, les dysfonctionnements du marché de crédit, matérialisés notamment par l'incapacité des agents non-financiers à répondre aux exigences des banques en termes de collatéral, excluent de nombreux ménages et entreprises du marché de crédit, contribuant de ce fait à baisser systématiquement la demande de crédit.

Compte tenu de toutes ces difficultés rencontrées par les banques africaines dans leur fonction d'intermédiation, celles-ci adaptent leur business model au contexte en place en s'orientant notamment de plus en plus vers des activités bancaires non-traditionnelles. Dans le chapitre 4, nous montrons que cette réorientation d'activités a peu d'effet sur les banques africaines en termes de rentabilité et de stabilité, à l'exception des petites banques. Celles-ci manquent des ressources et des compétences requises pour opérer sur ces nouveaux segments et dont bénéficient les banques en mesure de s'appuyer sur des réseaux internationaux (panafricains ou globaux) ou résultant de l'appui de la puissance publique.

Les résultats de la thèse permettent une meilleure compréhension des contraintes institutionnelles qui pèsent sur les banques africaines et de leurs conséquences sur leurs conditions d'exercice. De fait, les banques d'Afrique sub-saharienne opèrent le plus souvent dans des contextes institutionnels marqués par de nombreuses déficiences. Ces déficiences conditionnent leurs choix stratégiques et opérationnels, impactant tant la structure des activités bancaires (telle que reflétée par la structure des bilans et des revenus) que leur rentabilité ou leur stabilité. Les spécificités qui ont été plus spécifiquement étudiées dans la thèse : la sous-représentation des activités de crédit, la surliquidité des bilans ou encore des niveaux d'efficience technique généralement faibles ne peuvent être comprises et levées qu'en identifiant les facteurs les plus susceptibles de les déterminer. Ainsi, les résultats de la thèse suggèrent que des politiques uniquement axées sur le secteur bancaire telles que le développement de l'assurance des dépôts ou le renforcement de la qualité des procédures de supervision, pour importantes qu'elles soient, ne pourraient n'avoir que des effets limités sur la capacité du secteur bancaire à financer les agents non-financiers. A l'inverse, des réformes permettant un renforcement de la capacité à produire de l'information ou encore d'améliorer le respect des contrats apparaissent comme plus

étroitement associées à la capacité des banques à offrir des financements. En outre, la thèse montre que les banques africaines ne sont pas toutes en mesure de répondre de la même manière aux évolutions de leurs métiers telles qu'elles sont visibles à travers les changements structurels de leurs revenus. Dans des contextes locaux où l'accès aux ressources tant financières qu'organisationnelles est compliqué, les options stratégiques ouvertes aux banques les plus impactées, i.e. les établissements de petite taille avec un fort ancrage domestique, peuvent s'avérer limitées. Ces résultats questionnent le positionnement de ces établissements de crédit dans le contexte de l'Afrique sub-saharienne.

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Table des tableaux et des figures

Table des matières

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Cadre Institutionnel et Gestion des Institutions Financières : Trois Essais sur les Banques Africaines

Résumé

Le système bancaire africain est sous-développé. En moyenne, les banques africaines prêtent peu, s'engagent sur des maturités courtes, réalisent des marges nettes d'intérêts élevées tout en imposant des conditions de prêts contraignantes aux agents non-financiers. Ces caractéristiques sont le reflet des contraintes institutionnelles qui pèsent sur l'activité bancaire dans ces pays. Cette thèse contribue, d'une part, à une meilleure compréhension de ces contraintes institutionnelles et, d'autre part, à mieux en cerner les conséquences sur l'activité bancaire. Le chapitre 2 met ainsi en évidence de quelle manière la capacité des banques africaines à assurer leur fonction d'intermédiation financière efficacement est déterminée par le degré de protection des créanciers et des emprunteurs, le cadre contractuel en place, mais aussi la qualité de la règlementation. Contraintes, ces banques détiennent des niveaux élevés de réserves tandis que les agents non-financiers peinent à se financer. Dans le chapitre 3, nous expliquons ce paradoxe par une demande viable structurellement faible compte tenu des déficiences sur le marché de crédit. Enfin, les banques africaines adaptent leur business model au contexte en place en s'orientant vers des activités bancaires non-traditionnelles. Le chapitre 4 montre que ce repositionnement a des conséquences sur la rentabilité et la stabilité notamment des petites banques qui manquent des ressources nécessaires pour pénétrer ces nouveaux segments.

Mots clés : Banques, Cadre Institutionnel, Afrique, Intermédiation Financière, Thésaurisation de réserves, Business Model, Performance, Stabilité.

Summary

The banking system is underdeveloped in Africa. Banks are reluctant to lend, commit to shorter maturities, and enjoy higher net interest margins, while non-financial agents experience harsh difficulties in accessing the credit market. These characteristics reflect the institutional constraints faced by banks in their operations. This thesis contributes to a better understanding of these institutional constraints and their consequences on banking in Africa. Chapter 2 highlights how African banks' ability to perform financial intermediation efficiently is determined by the protection level of borrowers and lenders, the contractual framework, and regulatory quality. Given these constraints, African banks hoard high levels of reserves while non-financial agents struggle to access to external finance. In chapter 3, we explain this paradox by the structurally low demand for credit induced by the deficiencies on the credit market. Lastly, African banks are adapting their business model to their operational context by shifting towards non-traditional banking. Chapter 4 shows that this shift has adverse consequences on the profitability and stability of smaller banks, which may lack the resources and capabilities necessary to engage in these new markets.

Keywords: Banking, Institutional Framework, Africa, Financial Intermediation, Reserves Hoarding, Business Model, Performance, Stability.