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Essays on the Dividend Policy of Financial and Non-Financial Firms

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General Introduction

"*The harder we look at the dividend picture, the more it seems like a puzzle, with pieces that just don't fit together*", Black (1976).

More than five decades since the seminal paper of Miller and Modigliani (1961), dividend policies are still one of the trickiest puzzle in corporate finance. Their article shows that under complete information, with no market frictions and full rationality of agents, dividend policy is irrelevant for shareholder wealth. A pragmatic question remains: why do firms keep paying dividends? Since this seminal paper, a substantial literature has provided theoretical as well as empirical evidence on different aspects of dividend policies by relaxing core assumptions, to test whether dividends are relevant, and if so what determines dividend payouts. However, existing theoretical and empirical studies testing various proposed dividend theories still provide mixed results.

The first group of theoretical studies relax the 'no tax' assumption. The theory is proposed by Brennan (1970) and Litzenberger and Ramaswamy (1979), who show that once personal tax is considered, dividends are relevant for firms' value. This theory shows that there is a tax clientele explanation for dividend payments, where investors are divided in different groups depending on the tax rates they face, and that they have different preferences for dividend policy. Empirical studies have provided mixed results on the tax clientele explanation. Elton and Gruber (1970), Pettit (1977), Scholz (1992), and Graham and Kumar (2006) show that individual investors' preference over dividends is sensitive to their tax brackets. Thus, firms can adopt different dividend policies depending on the clienteles they want to cater for. Desai and Jin (2011) and Hanlon and Hoopes (2014) provide further evidence that firms consider tax in their dividend policies while Grinstein and Michaely (2005) and Floyd *et al.* (2015) provide empirical evidence that is not in line with dividend-tax theory. Another clientele-based dividend theory is provided by Baker and Wurgler (2004), namely the catering theory of dividends. Their work shows that managers pay dividends when investors put a stock price premium on dividend paying stocks. In other words, managers cater to investors based on what they prefer in dividends. However, the empirical study of Denis and Osobov (2008) does not find support for this theory.

Another group of studies tries to explain dividend policy relaxing the assumption of symmetric information between corporate insiders and outsiders, where dividend payments act as a signal for investors. When managers cannot communicate positive information to investors in a credible way, resulting in an undervaluation of firms, unexpected changes in dividend payments can mitigate the asymmetric information between managers (insiders) and outside investors. Even if dividends are costly and inefficient in these models, managers of undervalued firms have incentives to announce dividends to boost the market price. Bhattacharya (1979), John and Williams (1985) and Miller and Rock (1985) develop models of dividends under asymmetric information and show that dividends act as a signal that reveals private information and future prospects of the firm. However, empirical results testing the signaling hypothesis are mixed. Healy and Palepu (1988), Yoon and Starks (1995), and Amihud and Murgia (1997) support this hypothesis, whereas DeAngelo *et al.* (1996), Benartzi *et al.* (1997), and Li and Zhao (2008) do not support it. A problem with dividend signalling models is that they cannot explain why empirical evidence shows that dividends are concentrated among the larger, older and more profitable firms, which are supposed to have fewer asymmetry of information problems (Fama & French 2001).

Both the dividend tax clientele and the signalling theory of dividends assume that managers aim at maximizing the equity value of firms; however, the model of Jensen and Meckling (1976) assumes that managers do not always do so. By relaxing the assumption of complete contracts[1], Jensen and Meckling (1976) and Easterbrook (1984) show that there is an agency problem between managers and shareholder, as managers can engage in actual extraction of corporate resources, such as through excessive salaries, perks or transfer of assets on non-market terms to related parties. Hence, managers do not always maximize shareholders' wealth. The recognition of the conflict of interest between managers and shareholders gives rise to the free cash flow agency problems. Easterbrook (1984), Jensen (1986), and Zwiebel (1996) show that the payment of dividends decreases the level of funds available for perquisite consumption and investment opportunities and requires managers to seek financing in capital markets. They

[1] Agency problems are defined as where the principal of the firm cannot guarantee that invested funds are not expropriated or wasted on unattractive projects (Shleifer & Vishny 1997). This problem arises because one cannot have a complete contract. Even if one could, it would be very difficult to enforce such a contract. Agency problems are important as Jensen and Meckling (1976) show that it impacts the firm's value. Agency problems incur agency costs: the greater the agency problem, the higher is the agency cost, thus the lower the value of the firm. Here, agency cost is the difference between the value of optimal investments which maximize firm value (i.e. shareholders' wealth) and the investments that managers choose that will maximize their own wealth. Another way to define agency costs is the difference between the value of the project and the pledgeable funds that investors are willing to invest due to the agency problems.

further show that although issuing securities is a costly process that could be avoided by retained earnings, monitoring by capital markets can reduce the cost associated with ownership and control separation in the case of dispersed ownership. The main prediction of these models is that firms with agency problems distribute their free cash-flow as dividends. Moreover, dividend policy is expected to evolve over the life cycle of the firm in response to their investment opportunities and the agency problems (Lease *et al.* 2000).

Along the same lines, Faccio *et al.* (2001) argue that in a concentrated ownership structure, the agency problem is not between principals and managers but between the controlling shareholder (insider) and outside shareholders (minority shareholders). The effect of controlling ownership on firm value depends upon the trade-off between shared benefits of control and any private extraction of firm value by controlling shareholders. The theoretical literature demonstrates that controlling shareholders can impose greater monitoring on management and use their influence to push managers to make decisions that increase overall shareholder value and thereby benefit all shareholders (Jensen & Meckling 1976; Shleifer & Vishny 1986). In other words, concentrated ownership can align the interests of controlling shareholders with those of non-controlling ones. However, there can also be private benefits of control in the sense that they profit only the controlling shareholders (Grossman & Hart 1980; Bebchuck 1999; Shleifer & Wolfenzon 2002). Some shareholders might enjoy the ‘‘psychic’’ value attached to being in control; these benefits do not necessarily affect other shareholders (Harris & Raviv 1988; Aghion & Bolton 1992). However, when controlling shareholders use their power to expropriate corporate resources for their own private consumption, then other shareholders would be affected through the reduction in firm value (Jensen & Meckling 1976). When controlling shareholders pursue such objectives that are not profit-maximizing but increase their personal utility, having such controlling shareholders can lead to an entrenchment problem. In this context of conflict of interest between majority and minority shareholders, dividends could be used to limit the extraction of private benefits. Gomes (2000) proposes a new theoretical explanation to dividends that are used by controlling shareholders to increase their reputation. Faccio *et al.* (2001) also mention that dividends are a useful tool that can limit insider expropriation as dividends remove the wealth from insiders’ control. In other words, large shareholders can signal their unwillingness to extract private benefits by granting dividends to minority shareholders (signaling behavior). On the other hand, large shareholders can decide to decrease dividends as it increases the funds at their discretion (entrenchment behavior). The empirical literature analyzing the impact of concentrated ownership on dividend policy

provides mixed results. Bøhren *et al.* (2012) and De Cesari (2012) find that higher dividends are paid when the agency conflict between large and small owners is stronger, consistent with the signaling behavior. However, Faccio *et al.* (2001) and Gugler and Yurtoglu (2003) find that dividends are higher in firms with the presence of multiple large shareholders; the other large shareholders impede the controlling shareholder's expropriation of minority shareholders.

In line with the agency explanation of dividends, La Porta *et al.* (2000) show that firms around the world use dividends to solve agency problems, especially the agency problem of equity. In their study they test two competing agency models of dividends. The first model argues that dividends are an outcome of the legal protection for shareholders, as these can put pressure on managers to disburse cash only when they have greater legal rights (outcome model of dividends). The second model argues that dividends are used as a substitute of weak shareholder protection. Insiders pay higher dividends to establish a reputation in the capital market when shareholder rights are weak (substitute model of dividends). La Porta *et al.* (2000) find support for the outcome model, showing that dividend policies depend on external governance mechanisms, i.e. the legal protection for shareholders.

The aforementioned existing literature only considers agency conflicts of equity, between either shareholders and managers or majority and minority shareholders. However, another type of agency conflict can arise between shareholders and debtholders, namely the agency conflict of debt. Shareholders, through managers, can transfer wealth from debtholders by choosing strategies that increase bondholders' risk[2]. There are at least two channels explaining this wealth transfer. First, managers can take on riskier projects than the risk profile that they have in their current portfolio, which will only benefit shareholders[3] while burdening debtholders with the risk (Jensen & Meckling 1976). Second, managers in a firm with risky debt financing may pass on some positive NPV projects, which results in suboptimal investment[4], and then use the funds to pay dividends to the shareholders (Myers 1977; Kalay 1982). Dividend policies can then be used to solve this agency problem, in this case by paying lower levels of dividends. Brockman

[2] This is assuming that the interest of managers is aligned with those of shareholders.
[3] It is only shareholders that enjoy all gains from the riskier projects, whereas debtholders get a fixed predetermined rate payment (coupon). Nevertheless, the increasing risk will decrease the value of the outstanding debt.
[4] See Myers (1977) exposition of the debt overhang problem. Using a call option framework, Myers shows that issuing risky debt will make managers pass up some positive NPV projects, resulting in suboptimal investment which finally reduces the value of the firm. In this case, managers will only exercise the investment opportunities when the asset value is greater than the value of debt claims. The opportunity loss from this suboptimal investment is an agency cost of debt.

and Unlu (2009), extending the work of La Porta *et al.* (2000), investigate if creditor rights, a proxy for the level of the agency conflict of debt, influence dividend policies of non-financial firms. Their study finds that the role of creditor rights in determining dividend payouts is even greater than shareholder rights. This study provides evidence that dividends are used to balance the interests of firms' stakeholders, especially between shareholders and creditors.

While there is an extensive literature analyzing whether dividend policies are used as a corporate mechanism to reduce agency conflicts in the case of non-financial firms, few empirical papers analyze it for financial firms, in contrast with its regulatory relevance. Banks have several characteristics that distinguish them from other industries, and they are heavily regulated in response to significant negative externalities associated with their failures. Banks are highly leveraged and have heterogeneous sources of funding that can come from both retail depositors and wholesale funding, with either short maturities (certificates of deposit, repurchase agreements) or long maturities (subordinated debt, covered bonds). These creditors might behave differently in regard to bank dividend policies, since most of them cannot impose neither dividend covenants nor private lending agreements. More importantly, a large proportion of these creditors (depositors) are insured by public guarantee schemes. Thus, they will have less incentive to monitor banks' policies. Moreover, banks are more opaque than other industries, i.e. have higher information asymmetry (Morgan 2002; Caprio *et al.* 2007). These factors make the agency problems in banks even more complex than those of non-financial firms (Barth *et al.* 2004).

Banks might also have a unique form of corporate governance (Adams & Mehran 2003). These unique characteristics of banks raise questions about the extent to which dividend payout decisions are different for banks. This issue is an important one because the distribution of earnings as dividends obviously reduces banks' ability to generate capital internally, and then transfers default risk to their creditors and deposit insurer. The global financial crisis has shed light on the severe malfunctioning of several mechanisms of internal and external governance of financial institutions. Evidence of large scale dividend payouts in the banking sector despite widely anticipated losses has since renewed the interest for the determinants of banks' dividend payouts. As pointed out by Acharya *et al.* (2009) and Acharya *et al.* (2013), such payments represent a wealth transfer from creditors and tax payers to shareholders in violation of the priority of debt over equity. Moreover, as banks are the main creditors of the other banks, this transfer could affect bank default risk (Acharya et al. 2013). In another study, Forti and Schiozer (2015) show that banks actually use dividends to signal their asset quality and liquidity during

the crisis in Brazil. Floyd *et al.* (2015) show that the declining dividends (Fama & French 2001) of non-financial firms are not evident for banking firms in the US. These empirical findings indicate that dividends are very important for banks.

Maintaining a well-functioning and stable financial system requires a better understanding of how the different stakeholders behave and interact together, prompting the need to investigate better ways to ensure sound corporate governance mechanisms in the banking industry. Hence, the first objective of this dissertation is to investigate whether banks use dividends to reduce the agency conflicts between the different stakeholders. Another objective is to investigate if the implementation of regulation on dividend policy to oblige firms to pay dividends for good governance purposes is desirable.

In Chapter 1, we extend the work of La Porta *et al.* (2000) and Brockman and Unlu (2009) by examining if bank managers use dividends to reduce the agency cost of equity (managers vs. shareholders) and agency cost of debt (shareholders vs. creditors), measured by the level of shareholder rights and creditor rights, respectively. We then further investigate whether those relationships are shaped by bank-specific characteristics on funding structure, levels of capitalization and bank capital stringency regulation. Thus, in this chapter, we consider a panel of listed banks with relatively dispersed ownership structure around the world, in order to have heterogeneity in the level of shareholder and creditor rights. The main finding of this chapter is that bank managers strike a balance in their dividend policy that depends on the relative strength of the agency conflicts faced by their shareholders and creditors, with however a more decisive role played by the agency cost of equity than the one of debt. Nevertheless, we find that dividends play a substitute role for weak shareholder and creditor rights.

While Chapter 1 investigates if dividends are used to reduce the agency conflict between managers-shareholders and shareholders-creditors in a dispersed ownership setting, Chapter 2 complements this work by further exploring if the degree of ownership concentration (dispersed vs. concentrated) and the level of asymmetric information faced by outsiders influence the dividend payout decisions of banks. We then consider both the agency conflict between managers-shareholders (dispersed ownership) and between majority-minority shareholders (concentrated ownership). As aforementioned, the influence of asymmetric information on dividend payouts is of particular importance for banks as their financial structure combined with high leverage makes them inherently more opaque than other firms. The consequences for banks' dividend policies of having a concentrated ownership structure combined with a high

degree of opacity are not a clear cut issue. Our objective is to determine which hypothesis, signalling or entrenchment, dominates, in both a dispersed and a concentrated ownership setting, allowing for different levels of opacity. To test these hypotheses, we use both listed and non-listed European banks that present substantial variability on individual level of ownership concentration. The main finding of this chapter is that banks with either a concentrated or a dispersed ownership structure pay lower dividends when they have high degrees of opacity. These results are consistent with the entrenchment behavior for banks, with insiders (managers or majority shareholders) paying lower dividends to extract higher levels of private benefits when outsiders face higher degrees of asymmetric information, as it might be more difficult to detect such opportunistic behavior. Further findings show that a higher level of shareholder protection and stronger supervisory regime help to constrain the entrenchment behavior of majority shareholders.

Chapter 1 and Chapter 2 show that bank regulations have a significant influence on bank dividend payouts, especially in preventing expropriation by insiders. Chapter 3 is then devoted to policy recommendation/discussion in the light of the mandatory dividend regulation proposal in the Indonesian capital market. Starting from the fact that the number of dividend payers of listed firms in Indonesia Stock Exchange (IDX) has recently been declining, IDX management propose the implementation of mandatory dividend regulation. They argue that the declining dividends do not represent good corporate governance practice, and thus might have a negative impact on the investment climate in IDX. Not paying dividends can be interpreted as an expropriation problem, especially in a country with weak investor protection such as Indonesia.

However, there is a trade-off between generating economic growth and attracting investors to invest in Indonesia. On one side, retaining profits (by decreasing dividend payouts) to finance the abundant projects in a high economic growth country is the best way to maximize the value of the firm. Forcing growing firms to pay dividends might then hamper their growth and harm the value of the firm. Some empirical studies have already given some explanations regarding the declining dividend phenomena using a dividend life-cycle explanation, that firms' dividend policy follows their life-cycle (Fama & French 2001; DeAngelo *et al.* 2006; Denis & Osobov 2008; Fatemi & Bildik 2012). Young, small, less profitable firms with abundant growth opportunities and low levels of agency conflict will pay no or few dividends while mature, large, more profitable firms however with low growth opportunities and large agency conflicts will pay generous dividends.

This chapter aims to provide empirical evidence using the dividend life-cycle hypothesis to assess whether mandatory dividend regulation is necessary, especially in emerging market countries with weak shareholder rights such as Indonesia. If dividend payout policies of firms in IDX follow their life-cycle, mandatory dividends might not be necessary, or if it were to be implemented, the regulation should consider the firm's life-cycle. We use industrial (non-financial) firms listed in IDX as the sample to examine the dividend life-cycle hypothesis[5]. The main finding of this chapter is that the dividend policies of non-financial firms in IDX indeed follow their life-cycle. Hence, forcing dividend payments to limit expropriations are not necessarily good, especially for firms that are in the growth stage.

[5] We cannot examine this for banking industry only as the number of sample is too small. Nevertheless, empirical studies (e.g. Floyd *et al.* (2015)) show declining dividend phenomena is not evidence for banking firms.

Chapter 1: Bank Dividends and the Role of Shareholder and Creditor Rights[6]

[6] This paper was co-written with Laetitia Lepetit, Céline Meslier and Frank Strobel.

1. Introduction

The seminal work of Jensen and Meckling (1976) proposes a theory of the firm based upon conflicts of interest between various contracting parties, namely managers, shareholders, and debtholders. Managers can use dividend policy to address the agency conflict between managers and shareholders, as paying dividends reduces the amount of free-cash flow at their disposal for potential extraction of private benefits. While paying dividends may weaken the agency conflict of equity between managers and shareholders, it may actually strengthen the agency conflict between debtholders and shareholders, through wealth transfer between the two; managers might be under pressure from debtholders to reduce dividend payments as a consequence. Managers thus face conflicting pressures that might have an impact on their dividend policies; these pressures will depend on the degree to which both shareholders and debtholders are protected, and thus empowered, by the legal environment.

The extent of legal protection of outside investors differs enormously across countries (see La Porta *et al.* (1998)). La Porta *et al.* (2000) analyze how dividend policy of non-financial firms is influenced by the strength of legal rights given to shareholders. They empirically compare two hypotheses: (i) the outcome hypothesis, stating that dividend payments increase in the strength of shareholder rights; (ii) the substitution hypothesis, claiming that firms located in countries with weaker shareholder rights will pay more dividends to bolster their reputation. Their results show that non-financial firms pay higher dividends in countries with stronger shareholder rights, in line with the outcome hypothesis. Later studies, however, also find some evidence in line with the substitution hypothesis, with (non-financial) firms' dividends able to reduce agency conflicts (De Cesari 2012), and to mitigate the conflict between strong and weak stakeholders (Bøhren *et al.* 2012).

Brockman and Unlu (2009), extending the work of La Porta *et al.* (2000), investigate if creditor rights also influence dividend policies of non-financial firms. They hypothesize that low dividend payments serve as a substitute mechanism for weak creditor rights, as managers will be more likely to consent to restrictive dividend policy when creditor rights are weak, in order to build their reputation in financial markets. Their results show that weak creditors rights lead to lower dividend payouts, in line with the substitution hypothesis, and that creditors play a more decisive role in determining the dividend policy of non-financial firms than shareholders. Furthermore, Shao *et al.* (2013) find evidence that the substitution hypothesis between dividend policy and weak creditor rights only holds in countries with strong shareholder protection.

The incentives faced by shareholders and creditors in influencing managers in their dividend payouts decisions are likely to be different for financial as compared to non-financial firms, in large part due to financial intermediaries' specific characteristics, particularly their unique liability structure and the existence of safety net policies protecting some creditors. Hence, in this paper we focus in particular on banks' dividend policy, how it depends on the relative strength of the various agency conflicts occurring between different stakeholders, and how it is influenced by banks' specific funding structure and the impact of the regulatory environment facing the banking industry.

Banks are highly leveraged and have heterogeneous sources of funding that can come from both retail depositors and wholesale funding, with either short maturities (certificates of deposit, repurchase agreements) or long maturities (subordinated debt, covered bonds). While the potential for expropriation of creditors is more severe for banks than non-financial firms, the incentives for both depositors and uninsured debtholders to discipline managers is weaker, in contrast to the empirical relationship observed for non-financial firms. First, depositors place money at standard contract terms featuring few or no indentures or specific covenants such as in firms' loan agreements.[7] Also, bank debtholders generally grant short-term secured funding to banks through loan agreements such as repurchase (repo) contracts, which may not necessarily impose dividend restrictions. Secondly, recent studies argue that most banks have a large number of small depositors who, individually, have few incentives for monitoring managers; hence, a "free rider" problem exists among depositors (Admati & Hellwig 2013). Thirdly, incentives for depositors to discipline managers in their dividend policies strongly depend on the presence of a deposit insurance scheme. Only depositors who are above the coverage limit would have incentives to discipline managers if there is a credible deposit insurance scheme.[8] However, Kauko (2012) theoretically shows that dividends are an important source of information for depositors when there is no deposit insurance. They signal both profitability and liquidity, as more liquid and profitable banks can pay higher dividends than illiquid and unprofitable ones. Forti and Schiozer (2015) find empirically that banks use dividends to signal asset quality and liquidity to their debtholders, particularly during periods of financial turmoil. However, Calomiris and Wilson (2004) provide evidence that cutting

[7] Loan covenants cover a variety of matters for non-financial firms, including dividends restrictions. This suggests that creditors can take preventive measures to discipline managers, such as imposing an upper bound on the total dividend amount over the life of a loan (Kalay 1982; Leuz *et al.* 1998).

[8] Martinez-Peria and Schmukle (2001) show that a lack of confidence in the existing deposit insurance scheme explains why in some emerging countries both insured and uninsured depositors react and withdraw their deposits during banking crises.

dividends could also be a way for distressed banks to avoid bank runs and restore depositor confidence. They show that during the Great Depression, cutting dividends allowed banks suffering from asset losses to reassure depositors that the risk of losing deposits was low. Finally, uninsured creditors may have greater incentives to exert discipline on managers through fund withdrawals and/or unwillingness to roll-over short-term debt (Dewatripont & Tirole 1994; Diamond & Rajan 2000; Diamond & Rajan 2001, 2012). This would hold in particular in countries with weak creditor rights. However, uninsured creditors' incentives to discipline managers also depend on the implementation of implicit government guarantees, such as bail-out packages. These guarantees provide insurance for all creditors in case of bank default, reducing their incentives to monitor bank managers (Karas *et al.* 2013; Gropp *et al.* 2014). As a consequence of these different particular bank specifics, we would expect that creditor rights have a weaker influence on dividend policy for banks than shareholder rights, whereas Brockman and Unlu (2009) argue the opposite relationship holds for non-financial firms.

Regulatory constraints on bank capital may further influence managerial decisions on dividend payments. Agency conflicts between shareholders and debtholders could be expected to matter less in countries with higher capital stringency, i.e. where supervisors are stricter in their approach to assess and verify the degree of capital at risk in banks. In such an environment, creditors would be less concerned by banks defaulting and thus not view larger dividends as an expropriation mechanism. Similarly, well-capitalized banks would not have to use dividends as a signal to creditors. When banks are undercapitalized, they face regulatory pressure to increase their regulatory capital ratio by not paying dividends. Moreover, as reducing dividends should be less costly than issuing capital, particularly in under-developed financial markets (Chae *et al.* 2009), shareholders and creditors might put similar pressure on managers to increase the regulatory capital ratio by cutting dividends. In line with this argument, several studies find that undercapitalized banks display lower dividend payments (Casey & Dickens 2000; Theis & Dutta 2009; Abreu & Gulamhussen 2013).

The banking studies on dividend policies to date have mostly focused on U.S. bank holding companies, analyzing the role of dividends as a signaling mechanism when there is a conflict of interest between managers and shareholders, but abstracting from the balancing strategy of banks imposed by conflicting interests between shareholders and creditors (Filbeck & Mullienaux 1993; Bessler & Nohel 1996; Filbeck & Mullienaux 1999; Dickens *et al.* 2002; Theis & Dutta 2009; Abreu & Gulamhussen 2013; Floyd *et al.* 2015). Onali *et al.* (2015),

working on a sample of European listed banks, further investigate if government involvement has an impact on bank dividend policy, together with CEO power and incentives. They find that the presence of government officials on the board of directors of banks shapes managers incentives and leads to lower payout ratios, providing evidence that governments favor bank safety and the interests of creditors above those of shareholders.

We extend and contribute to this literature by, firstly, analyzing whether banks' dividend payouts are influenced by the relative strength of the agency costs of equity and debt, measured by the level of shareholder protection and creditors rights, respectively. We then investigate whether those relationships are shaped by differences in funding structure, levels of capitalization and capital stringency, and potential differences in external corporate governance mechanisms. The latter are motivated by existing literature on non-financial firms which finds that market competition (Grullon & Michaely 2012; Knyazeva & Knyazeva 2012) and transparent and well-functioning markets (Brockman & Unlu 2011) can be either substitutes or complements to dividend policies in reducing agency conflicts. To carry out our empirical investigation, we use a panel of 1,153 listed banks from 51 countries with considerable heterogeneity in shareholder and creditor rights across countries. We limit our analysis to listed banks having a dispersed ownership structure to be able to focus on the two potential agency conflicts between managers vs shareholders, and shareholders vs creditors.

We find that bank managers strike a balance in their dividend policy that depends on the relative strength of the agency conflicts faced by their shareholders and creditors, with however a more decisive role played by the agency cost of equity than the one of debt. Our results further demonstrate that dividend payments are substitute mechanisms for low levels of shareholder protection, independently of bank funding structure, well-functioning of financial markets or competition in the banking market. This implies that, for shareholders, the potential to be expropriated by managers is not reduced by any of these factors. On the other hand, we show that dividend payments can be used as substitute mechanisms for low levels of creditor protection only in the presence of either strong competition in the banking market well-functioning financial markets, or strong law enforcement. We furthermore find that higher levels of capital stringency and higher exposure to debtholders' disciplining behavior act as substitute mechanisms for creditor protection, but not for shareholder protection.

Our paper contributes to the literature in several ways. We extend the literature on corporate payout as, to the best of our knowledge, our study is the first to analyze if bank managers adopt a balancing stretagy in their dividend policy depending on the relative strengths of the agency

conflicts faced by their shareholders and creditors. We also contribute to the growing empirical literature analyzing the determinants of the dividend policy of banks; this is of great interest as the Federal Reserve Board (FRB 2011) and the Basel Committee on Banking Supervision (BCBS 2011) have been emphasizing the necessity to increase oversight of banks' dividend payouts. More generally, we also contribute to the wider literature which argues that financial firms behave differently than non-financial firms due to their particular characteristics. Banks are intrinsically opaque, have highly leveraged funding structures, and are heavily regulated in response to significant negative externalities associated with their failures (Morgan 2002). They consequently have a unique form of corporate governance (Adams & Mehran 2003), with more stakeholders than non-financial firms, including depositors, non-insured debtholders, deposit insurers and regulators, raising important questions about the extent to which dividend payout decisions are different for banks.

Section 2 now describes our sample and defines the key variables; Section 3 presents the methodology, and presents and discusses our main results; Section 4 examines further issues and carries out several robustness checks, and Section 5 concludes the paper.

2. Data, variables and summary statistics

2.1 Sample selection

Our sample covers listed banks (bank holding companies, commercial banks, cooperative banks, and saving banks) from the 72 countries for which Djankov *et al.* (2008b) and Djankov *et al.* (2007) report information on both shareholder rights and creditor rights. We extract financial statement data from BvD Bankscope for the 2001 to 2014 period, using consolidated statements when available, and unconsolidated ones otherwise. BvD BankScope provides financial statement data for 3,235 active banks for at least some of the period considered.

Following La Porta *et al.* (2000), we exclude countries with mandatory dividend rules (i.e., legal requirements that dividends have to be larger than some fraction of net income), which are Brazil, Chile, Colombia, Greece, Venezuela, and Uruguay. We further exclude New Zealand, as in Leaven and Levine (2009), as almost all banks there are subsidiaries of Australian banks. After these exclusions, we have 66 countries left with 2,787 banks (39,018 bank-year observations). After eliminating banks without information regarding dividends, we are left with 2,368 banks with 18,453 bank-year observations. Furthermore, as our objective is to focus on the conflict of interest between shareholders and managers, we further exclude banks for

which the largest shareholder holds more than 51% of the shares. We also exclude banks for which we do not have information on their ownership structure, using either BvD Bankscope, Bloomberg, Thomson One Banker or their annual report when available. This leaves us with 1,325 banks (10,914 observations). We also exclude observations where banks have negative dividends, negative equity to total assets, and dividends to net income ratio greater than 100%. After further data cleaning of bank-level variables, excluding the 1st and 99th percentiles, and requiring banks to have complete information on the relevant bank-level and country-level variables, we end up with a final sample of 1,148 banks (7,336 observations) from 51 countries; Table A1 in Appendix A gives a breakdown of these by country.

2.2. Variable definitions

In this section we define the key variables used to analyze if banks' dividend policy is determined by the interplay between differing strengths of shareholder and creditor rights, differences in funding structure, levels of capitalization and capital stringency, and potential differences in external corporate governance mechanisms. The description and data sources of each variable are presented in Table 1, with associated summary statistics.

2.2.1. Dividend policy

Dividends are expressed as the dividends to net income ratio (DP_{ijt}), the payout ratio decided by banks. It is the most commonly used measure of dividend payouts and captures the main element of the payout policy (Mitton 2004; Francis *et al.* 2011; Byrne & O'Connor 2012; Onali 2014).

2.2.2. Shareholder rights

We use the anti-director index ($ShareholderRights_j$), computed by La Porta *et al.* (1998) and revised by Djankov *et al.* (2008b), to measure the level of shareholder rights for each country. Legal protection gives investors power against expropriation by managers, allowing them to have minority shareholder protection as well as a legal prohibition of managerial self-dealing (Shleifer & Vishny 1997). The anti-director index represents several measures: (i) if a country allows shareholders to mail their proxy vote to the firm, (ii) whether or not shareholders are required to deposit their shares prior to the General Shareholders' Meeting, (iii) whether cumulative voting or proportional representation of minorities on the board of directors is allowed, (iv) if an oppressed minorities mechanism is in place, (v) if the minimum percentage of share capital that entitles a shareholder to call for an Extraordinary Shareholders' Meeting is

less than or equal to 10 percent (the sample median), and (vi) if shareholders have preemptive rights that can only be waived by a shareholders' vote. The index ranges from 0 to 6, with a higher value indicating better shareholder rights.

2.2.3. Creditor Rights

The creditor rights index ($CreditorRights_j$) is taken from La Porta *et al.* (1998) and Djankov *et al.* (2007). The index measures the legal protection of creditors in case of reorganization or liquidation of the debtor. It represents several elements: (i) if creditors' consent is required to file for reorganization, (ii) if secured creditors are able to take possession of collateral assets once the reorganization petition has been approved (no automatic stay), (iii) if secured creditors are ranked first in the distribution of the proceeds that result from the disposition of the assets of a bankrupt firm, and (iv) whether the debtor does not retain the administration of its property pending the resolution of the reorganization. The index ranges from 0 to 4, with higher values indicating stronger creditor protection.

2.2.4. Market discipline of creditors

Banks have higher financial leverage than non-financial firms, and also numerous creditors with potentially different incentives to exert influence over corporate dividend payouts. Differences of liability structure across banks may lead to differences in the way debt discipline will be exerted and can influence managers' decisions on the dividend policy. When deposits are the main source of funding, only large depositors would demand managers to pay less dividends in the presence of a deposit insurance mechanism. For banks which strongly rely on wholesale funding, uninsured debtholders might have stronger incentives to put pressure on managers to pay less dividends, in particular in countries with weak creditor rights. However, more reliance on wholesale funding also implies greater exposure to market disicpline, which might lead to better alignment of the interests of managers and creditors, reducing the need to use dividends as a signaling mechanism.

We use the variable $MarketFund/TF_{ijt}$, defined as the ratio of long term market funding to total funding (deposits and wholesale funding), to differentiate banks according to the potential pressure exerted by uninsured debtholders. For this, we compute the dummy variable $HighMarketFund/TF_{ijt}$ that takes the value of one if the underlying ratio is greater than the country-sample median, and zero otherwise. For data reasons, we have to exclude short term

market funding to ensure that we only consider uninsured debtholders.[9] However, we use the ratio of short term and long term market funding as a robustness check.

As we only have five countries with no explicit deposit insurance over the period considered, for a low number of observations, and similarly only four countries that adopted a deposit insurance system throughout period, we cannot use a dummy variable to differentiate these countries from the ones having an explicit deposit insurance scheme. Moreover, the creditor and shareholder rights indices are very similar across these countries.

2.2.5. Capital regulatory constraints

As the level of capital is naturally influenced by regulatory requirements, we control for the stringency of bank capital regulations in each country. For this, we use the Capital Stringency index ($CapString_{jt}$) developed by Barth *et al.* (2004). The index determines the nature of capital requirements and how capital is assessed and verified by banks and regulators; it ranges in principle from 0 to 11, where 11 represents the highest level of capital stringency (see the definition in Table 1 for more details). We follow the method described by Barth *et al.* (2013) to harmonize this index across the four surveys that are provided by the World Bank's Bank Regulation and Supervision program. We compute the dummy variable $HighCapString_{jt}$ that takes the value of one for a country if the index $CapString_{jt}$ is greater than the cross-country median at date *t*, and zero otherwise. In countries with high capital stringency, creditors might be more confident to recover their claims and thus will have less incentive to pressure managers to cut dividends. Hence, greater capital stringency may act as a substitute mechanism for dividend payments in countries with weaker creditor protection.

We furthermore expect banks with lower levels of capitalization to be constrained in their dividend payments, as the distribution of earnings reduces banks' ability to generate capital internally. We compute bank capital as the ratio equity to total assets ($Equity/TA_{ijt}$) for each bank, and its country median for each date *t*. We then classify a bank as undercapitalized at date *t* if its equity to total assets ratio is lower than the country median ratio. The dummy variable $Undercapitalized1_{ijt}$ takes the value of one if a bank is classified as undercapitalized at date *t*, and zero otherwise.

[9] Short term market funding in BvD Bankscope comprises senior debt maturing less than one year, money market instruments, certificates of deposits, commercial paper, margin deposits, but also corporate deposits (made by large commercial companies, public institutions, government agencies and large non-profit institutions) that benefit from the deposit insurance guarantee.

We alternatively use the total regulatory capital ratio (TCR_{ijt}) to identify banks that are undercapitalized. A bank is then classified as undercapitalized if its regulatory capital ratio is lower than the country regulatory threshold plus two percent. We then compute the dummy variable $Undercapitalized2_{ijt}$ as taking the value of one if a bank is classified as undercapitalized at date *t*, and zero otherwise. However, we apply this only as a robustness check, as it reduces our sample by 1,500 observations.

2.2.6. Degree of competition

Several theoretical papers show that intense product market competition impels managers to behave efficiently, with competition acting as a disciplinary force by removing incompetent managers from the market (Holmstrom 1982; Hart 1983). Recent empirical studies support these claims by finding evidence that product market competition mitigates the need for either internal or external corporate controls (Giroud & Mueller 2011). Taking this line of investigation even further, Grullon and Michaely (2012) examine whether product market competition influences managers' decision on the dividend policy of non-financial firms. Similarly to La Porta *et al.* (2000), they contrast two hypotheses: (i) strong competition can act as an enforcement mechanism that puts pressure on managers to distribute dividends instead of investing in non-profitable investments, similar to the impact of a strong legal system (the outcome hypothesis); (ii) alternatively, payout policy could be a substitute for such external disciplining factors through managers trying to enhance their reputation in the capital market (the substitution hypothesis). Their results support the outcome hypothesis with non-financial firms paying higher dividends in more competitive industries. Knyazeva and Knyazeva (2012) further examine empirically the interaction between a firm's competitive environment and shareholder legal protection; product market competition can be viewed as either an alternative or a complement to shareholder rights in aligning managerial and shareholder incentives. They find that higher shareholder rights are associated with larger dividend payments only in countries with a competitive product market environment, consistent with the hypothesis of a complementary relation between product market competition and strong shareholder rights. To further examine this issue for our case of financial firms, we need to compute a country-level measure of competition. For this we consider not only listed banks but also non-listed banks (bank holding companies, commercial banks, cooperative banks, and saving banks) to measure the degree of competition in the entire banking system. We extracted the data on non-listed banks also from BvD Bankscope.

We follow Leon (2015) and Love and Peria (2015) and use the Lerner Index to measure the degree of competition of the banking system.[10] The Lerner index is the difference between price and marginal cost. It therefore shows the ability of banks to set price above marginal cost. The higher the markup, the less competitive is the market. We compute the Lerner index using the methodology of Love and Peria (2015) (see Appendix B for more details). First, we estimate marginal cost by using a translog cost function, and then we compute, for each bank, the Lerner Index as the difference between price and marginal cost relative to price. We then transform these into a country-level measure of competition ($Lerner_{jt}$) by taking the average of bank-level Lerner indices by country and by year. Higher values of the Lerner index indicate greater market power, i.e. lower competition in the banking industry. We compute a dummy variable to differentiate countries with a higher level of competition in the banking industry ($Competitive_{jt}$), taking the value of one if the level for country *j* at date *t* is lower than the sample median, and zero otherwise.

2.2.7. Financial market characteristics

Market scrutiny and information contained in stock prices are essential to promote good corporate governance, to structure managerial incentives and hence reduce agency conflicts (Holmstrom & Tirole 1993; Levy-Yeyati *et al.* 2004). The different stakeholders can only monitor and discipline managers in the presence of well-functioning markets with high levels of disclosure and transparency. Well-functioning and efficient financial markets are important to enable the different stakeholders to better distinguish good from bad managers, as well as profitable from negative value investment projects. Disclosure quality also matters by making it more difficult to exploit outsiders when disclosure is transparent (Healy & Palepu 2001; Bushman *et al.* 2004; Lang *et al.* 2006). Brockman and Unlu (2011) provide evidence that disclosure quality has an influence on non-financial firms' dividend policy. They find that in opaque disclosure environments, managers pay dividends to build reputation among outside capital suppliers, in line with the substitution hypothesis; in transparent disclosure environments, they are confined to paying out dividends, consistent with the outcome hypothesis.

[10] We initially computed Panzar-Rosse H-statistics, following Claessens and Laeven (2004) and Bikker *et al.* (2012). However, Panzar-Rosse H-Statistics are only valid if the market is in equilibrium in the long run. We performed the equilibrium test used by Claessens and Laeven (2004), and found that 23 countries (out of 51) do not satisfy this requirement.

We follow Čihák *et al.* (2012) and measure the functioning of financial systems using the ratio market capitalization to GDP ratio, as a proxy for financial market depth ($CapDepth_{jt}$). We furthermore use the disclosure requirement index provided by the World Bank to measure the quality of information disclosed on financial markets ($Disclosure_{jt}$). The index ranges from 0 to 10, with higher values indicating more extensive disclosure requirements. We expect that well-functioning and transparent financial markets act either as a substitute mechanism to investor protection, leading to weaker influence of shareholder and creditor rights on dividend policy, or, alternatively, as a complementary one, with stronger impact of legal protection in well-functioning financial markets.

We compute the dummy variables $HighCapDepth_{jt}$ and $HighDisclosure_{jt}$, each of which takes the value of one if the underline ratio is greater than the respective sample median at date *t*, and zero otherwise. The disclosure index is not available for 14 countries and reduces our sample by 579 observations; we therefore include it only in an alternative specification, to run our main regressions on the largest sample defined in Section 2.1.

Table 1. Variable Definition

Variables	Definition	Source	Mean	SD	min	Median	max
Dependent Variables							
DP	Dividend paid related to the period over earnings.	BVD Bankscope	28.59	22.79	0	26.07	100
Div/TA	Dividend paid related to the period over total assets.	ibid.	0.28	0.32	0	0.2	3.52
Country Level Variables							
ShareholderRights	Revised anti-director rigths index represents several measures: (i) if a country allows shareholders to mail their proxy vote to the firm, (ii) whether or not shareholders are required to deposit their shares prior to the General Shareholders' Meeting, (iii) whether cumulative voting or proportional representation of minorities on the board of directors is allowed, (iv) if an oppressed minorities mechanism is in place, (v) if the minimum percentage of share capital that entitles a shareholder to call for an Extraordinary Shareholders' Meeting is less than or equal to 10 percent (the sample median), and (vi) if shareholders have preemptive rights that can only be waived by a shareholders' vote. The index ranges from 0 to 6.	La Porta *et al.* (2000) and Djankov *et al.* (2008).	3.54	1.09	1	4	5

CreditorRights	Creditor rights index measures the legal protection of creditors in case of reorganization or liquidation of the debtor. It represents several elements: (i) if creditors' consent is required to file for reorganization, (ii) if secured creditors are able to take possession of collateral assets once the reorganization petition has been approved (no automatic stay), (iii) if secured creditors are ranked first in the distribution of the proceeds that result from the disposition of the assets of a bankrupt firm, and (iv) whether the debtor does not retain the administration of its property pending the resolution of the reorganization. The index ranges from 0 to 4, with higher value indicating stronger creditor protection.	La Porta *et al.* (1998) and Djankov *et al.* (2007).	2.02	1.03	0	2	4
CapString	Index of bank capital regulation. This index is represented by the following questions: (1) Is the capital-asset ratio risk weighted in line with the Basel I guidelines? (2) Is the capital-asset ratio risk weighted in line with the Basel II guidelines? (3) Does the minimum capital-asset ratio vary as a function of an individual bank's credit risk? (4) Does the minimum capital-asset ratio vary as a function of market risk? (5) Before minimum capital adequacy is determined, which of the following are deducted from the book value of capital: Market value of loan losses not realized in accounting books? Unrealized losses in the securities portfolios? Unrealized foreign exchange losses? (6) What fraction of revaluation gains is allowed as part of capital? (7) Are the sources of funds to be used as capital verified by the regulatory/supervisory authorities? (8) Can the initial disbursement or subsequent injections of capital be done with assets other than cash or government securities? (9) Can initial disbursement of capital be done with borrowed funds? We follow the methodology used by Barth *et al.* (2013) to harmonize the computation of the index over the four different surveys.	Bank regulation and supervision database (Barth *et al.* 2013) - World Bank	7.75	1.53	4	8.09	11

HighCapstring	Dummy variable that equals one if the value of the variable *CapString* is greater than the sample median and zero otherwise.	Bank regulation and supervision database (Barth *et al.* 2013) - World Bank	0.45	0.38	0	0.38	1
Lerner	Lerner Index of country j in year t, computed using fixed effect method. It is the average of bank level Lerner Index. The Lerner index is the difference between price and marginal cost. It therefore shows the ability of banks to set price above marginal cost. The higher the markup, the less competitive is the market.	BVD Bankscope	0.205	0.056	0.104	0.196	0.333
Competitive	Dummy variable that equals one if the value of the variable *Competition* is lower than the sample median and zero otherwise.	BVD Bankscope	0.50	0.34	0	0.52	1
CapDepth	Ratio of market capitalization to gross domestic product. Higher value indicates more developed capital market.	Global Financial Development Database (GFDD) - World Bank	37.02	44.93	0.18	20.73	177.46
HighCapDepth	Dummy variable that equals one if the value of the variable *CapitalDepth* is lower than the sample median and zero otherwise.	BVD Bankscope	0.31	0.47	0	0	1
CapEfficiency	Ratio of the value of total shares traded to market capitalization (turnover ratio). Higher value indicates more efficient market.	GFDD	69.98	58.54	1.44178	54.5907	211.25
HighCapEfficiency	Dummy variable takes equals one if the value of the variable *CapEfficiency* is lower than the sample median and zero otherwise.	ibid.	0.60	0.37	0	0.66667	1
Disclosure	Disclosure requirement index measures the degrees to which corporations listed on local stock exchanges have to disclose relevant financial and other information. Higher value shows higher disclosure.	La Porta *et al*. (2006)	65.18	21.85	0	67	100
HighDisclosure	Dummy variable that equals one if the value of the variable *Disclosure* is higher than the sample median and zero otherwise.	Authors' computation	0.42	0.50	0	0	1

ROL	Rule of Law score captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Higher value shows stronger rule of law.	World Governance Index Database - World Bank	0.51	1.00	-1.2375	0.50	1.93
CGQ	Corporate governance quality index is the simple average of three proxy of accounting disclosure and transparency and reflects how accounting statements are being provided, how earnings are being smoothed, and how stock prices behave and reflect information about the firm.	DeNicolo *et al.* (2008)	10.84	5.75	0	10	21
Debt Enforcement	Measures the efficiency of debt enforcement. The efficiency index is built using a standardized case study of insolvent firm (a hotel about to default on its debt). This case was submitted to insolvency practitioners to 88 countries around the world. These practitioners have to describe the different procedures available by law to solve the case (foreclosure, reorganization, liquidation), which of these procedures is likely to be used in each country and whether the firm continue (or not) operating as a going concern thorough and upon the completion of the insolvency process. They also have estimate the time and the costs (court fees, attorney fees, administrator fees, liquidation fees…) associated to the different steps of these procedure. Using these information, the efficiency index is computed as the present value of the terminal value of the firm after bankruptcy costs. It ranges from 0 (weak debt enforcement efficiency) to 100 (strong debt enforcement efficiency). The higher the index, the higher the value of the firm after bankruptcy costs.	Djankov *et al.* (2008)	60.22	26.79	6.6	58.8	96.1
Crisis	Crisis periods as defined in the Global Financial Development Database of the World Bank. Dummy variable that equals one if there is a banking crisis in the country in a given year and zero otherwise.	GFDD and the central bank from each country	0.11	0.16	0	0	0.53

Bank-Level Variables							
MarketFund/TF	Ratio of long term market funding over total funding.	BVD Bankscope	9.22	13.14	0	4.45	68.76
HighMarketFund/TF	Dummy variable that equals one if the value of the variable *MarketFund/TF* is greater than the country median and zero otherwise.	ibid.	0.47	0.50	0	0	1
Size	Natural logarithm of total assets.	ibid.	15.05	2.19	10.50	14.46	20.74
ROA	Return on assets.	ibid.	0.83	0.96	-6.20	0.84	7.10
Asset Growth	Annual growth of total assets.	ibid.	10.87	15.60	-25.40	6.97	121.82
Equity/TA	Ratio of equity over total assets.	ibid.	9.23	4.60	0.66	8.66	70.97
TCR	Total weighted capital regulatory ratio.	ibid.	14.23	4.14	1.1	13.43	55.39
Undercapitalized1	Dummy variable that equals one if the value of the variable *Equity/TA* is lower than the country median and zero otherwise.	ibid.	0.50	0.50	0	0	1
Undercapitalized2	Dummy variable that equals one if the value of the total regulatory ratio (TCR) is lower than the country regulatory threshold plus two percent and zero otherwise.	ibid.	0.05	0	0	0	1
LnZscore	Natural logarithm of Z-score. Z-score is defined as: (MROA(3) ijt + Equity/TAij,t)/ SDROA(3)ij,t, where MROA(3)ij,t and SDROA(3)ij,t are the moving average and standard deviation of return on assets (with a window width of 3 years), and Equity/TAij,t is the equity to total assets ratio at date t. Higher Z-scores mean lower probabilities of default (Lepetit and Strobel 2015) and Lepetit and Strobel (2013).	ibid.	3.99	1.13	-0.06	4.08	6.56

2.3. Univariate evidence

As a first look at the data, we examine in Table 2 the average value of the dividend payout ratio (DP_{ijt}) for different subsamples, based on the key variables defined above.

Table 2. Banks' dividend payout ratios by category

	High	Low	High-Low	Mean test
ShareholderRights	26.17	29.69	-3.52	-6.14 ***
CreditorRights	35.35	27.89	7.46	8.22 ***
Marketfund/TF	29.11	28.13	0.98	1.83 *
CapString	28.87	28.08	0.79	1.41
Equity/TA	31.33	25.81	5.52	10.45 ***
Lerner	27.91	29.52	-1.61	-3.05 ***
CapDepth	29.93	24.53	5.4	8.79 ***
CapEfficiency	28.44	30.13	-1.69	-1.83 **
Disclosure	25.29	29.91	-4.62	-6.07 ***

*Dividend payout ratio = cash dividend related to the period/earnings; ShareholderRights = Revised anti director index (Djankov at al. 2008); CreditorRights = Creditor Rights Index (Djankov et al. 2007); Marketfund/TF = High if the ratio of market funding over total funding is higher than the country median; Capital Stringency =High if the Capital stringency index is higher than the sample median; Bank Capital= High if the ratio of equity to total assets is higher than the country median; Lerner = High if country-level Lerner Index is higher than the sample median (indicates less competition); CapDepth = High if the ratio of market capitalization over GDP is higher than the sample median; CapEfficiency = High if the ratio of the value of total shares traded to market capitalization (stock market turnover) is higher than the sample median. Disclosure = High if the disclosure requirement index (La Porta et al. 2006) is higher than the sample median; t-statistics are provided, with *p<0.01 **p<0.05 ***p<0.1.*

First, we compare the dividend payout ratio between countries with relatively weak and strong levels of shareholder and creditor rights. Table A1 in Appendix A shows that we have substantial heterogeneity in shareholder and creditor rights across countries. Mean tests in Table 2 show that banks located in countries with weaker shareholder rights have significantly higher dividend payouts than banks in countries with stronger shareholder rights, in line with the substitution hypothesis of La Porta *et al.* (2000). We further observe that banks pay lower dividends in countries with weaker creditor rights; this is consistent with the substitution hypothesis of Brockman and Unlu (2008), with banks paying dividends as a substitute to weaker creditor rights to build their reputation.

Secondly, our data indicates that banks with a higher proportion of funding provided by uninsured debtholders have higher dividend payout ratios; however, this is significant only at the ten percent level. We also find that well-capitalized banks have a higher payout ratio compared to undercapitalized ones. However, mean tests show no significant differences between banks located in countries with high or low levels of capital stringency.

Thirdly, Table 2 shows that banks in countries with stronger competition in the banking industry (lower Lerner Index) have significantly higher dividend payout ratios than those in less competitive banking markets, in line with the outcome hypothesis of Grullon and Michaely (2012). We further find that banks pay lower dividends in countries with higher capital market efficiency and higher quality disclosure, consistent with the hypothesis that managers use dividends as a substitute to well-functioning markets to establish a good reputation. We observe significantly lower dividend payments in countries with lower financial market depth; this can be explained by banks' need to limit dividend payments when capital markets are not well developed to accumulate more internal funds.

Section 3 now applies a more rigorous empirical specification to examine in greater detail the relationship between shareholder and creditor rights, in an addition to other relevant factors, on banks' dividend payments.

3. Empirical methodology and results

3.1. Role of creditor and shareholder rights

We use the following empirical specification to analyze how shareholder and creditor rights influence banks' dividend payments:

$$DP_{ijt} = \beta_0 + \beta_1 ShareholderRights_j + \beta_2 CreditorRights_j + \Lambda' FACTORS_{ijt} + \delta' X_{ijt} + \gamma' Z_{jt} + \alpha_t + \varepsilon_{ijt} \quad (1)$$

DP_{ijt} is the dividend payout of bank i in country j at date t; $ShareholderRights_j$ and $CreditorRights_j$ represent the levels of shareholder rights and creditor rights, respectively. $FACTORS_{ijt}$ are bank and market specific factors as described in Section 2.2, i.e. dummy variables for proportion of market funding ($HighMarketFund/TF_{ijt}$), capital stringency ($HighCapString_{jt}$), undercapitalization of banks ($Undercapitalized1_{ijt}$), competition ($Competitive_{jt}$), capital market depth ($HighCapDepth_{jt}$), and disclosure quality ($HighDisclosure_{jt}$).

We follow the existing literature and control for both individual (X_{ijt}) and country-level (Z_{jt}) variables that might also influence dividend payments. The literature on non-financial firms generally uses the natural logarithm of total assets ($Size_{ijt}$) for bank size, the return on assets as a profitability measure (ROA_{ijt}) and the asset growth rate ($AssetGrowth_{ijt}$) for investment opportunities. We expect large and more profitable banks to pay higher dividends, while banks

with high growth opportunities can be expected to retain earnings to avoid costly equity and debt financing. The banking literature suggests that bank risk may increase dividend payouts due to risk-shifting motives (Acharya *et al.* 2013; Kanas 2013; Onali 2014); we therefore include the logarithm of a time-varying Z-score, based on 3-year rolling windows, ($LnZscore_{ijt}$) to proxy bank default risk.[11] We also allow for banking crisis periods in each country, as defined in the Global Financial Development Database of the World Bank, by including a dummy variable ($Crisis_{jt}$) that takes the value of one if there is a banking crisis in the country *j* at date *t*. Lastly, we also include year fixed effects.

We check for the absence of multicollinearity problems by computing the correlation matrix (see Table A2) and the variance inflation factors (VIF), which have a mean value of 1.98 with a maximum of 2.58. Even though the variables *ShareholderRights* and *CreditorRights* have a correlation of 0.5, we do not have a collinearity problem as the standard errors of both *ShareholderRights* and *CreditorRights* do not inflate.

As the shareholder and creditor protection measures are time invariant, we can use random effects estimation (RE) if the explanatory variables are not correlated with the unobserved individual effect, or otherwise the Hausman-Taylor (HT) estimator (Hausman & Taylor 1981) to run Eq. (1).[12] To apply HT estimation, one must decide which, if any, variables are correlated with unobserved individual effects (i.e. endogenous) and which variables are strictly exogenous (Baltagi *et al.* 2003). The choice of exogenous variables in HT is a testable hypothesis; Baltagi (2005) suggests using a Hausman specification test between FE and HT as an over-identification test[13]. If there are no systematic differences in coefficients between FE and HT estimation, HT is as consistent as FE while being more efficient than FE, and the set of instruments is validated. We perform Hausman tests on the difference between FE and HT for each estimation in this study to test if the choice of exogenous variables is valid; we also use this test to choose the best combination that maximizes the p-value of the test. We find that the

[11] The Zscore is defined as: $(MROA(3)_{ijt} + Equity/TA_{ij,t})/ SDROA(3)_{ijt}$, where $MROA(3)_{ijt}$ and $SDROA(3)_{ijt}$ are the moving average and standard deviation of return on assets (with a window width of 3 years), and $Equity/TA_{ijt}$ is the equity to total assets ratio at date *t*. Higher Z-scores mean lower probabilities of default.; see Lepetit and Strobel (2015) and Lepetit and Strobel (2013) for derivation and time-varying implementation of Z-score measures, respectively.

[12] We estimate equation 1 using fixed effects (FE) and random effects (RE), and also the Hausman Taylor (HT) estimator as reported in Table A3 in Appendix A. Comparing the three estimations, they show very similar results, in terms of sign, significance, and magnitude. However, the Hausman specification test on FE and RE rejects the null hypothesis, suggesting that FE is the appropriate estimator. Hence, we should use HT estimation. Then, to test if HT estimation is as consistent as FE, we report the Hausman specification test between FE and HT. The test shows that we cannot reject the null hypothesis, thus we use HT to estimate Eq. (1).

[13] See Baltagi (2005, p. 126) for details of this test.

variables $ShareholderRights_j$, $CreditorRights_j$, $CapString_{jt}$ and $CapDepth_{jt}$, are strictly exogenous, while all time-variant bank level variables are endogenous; hence, the HT estimator is used throughout.

The regression results for Eq. (1) are reported in Table 3. We have two different regressions as we introduce the two variables to control for financial market characteristics ($HighCapDepth_{jt}$, and $HighDisclosure_{jt}$) one by one in order not to reduce the sample of our main regressions[14].

Our results show that banks' dividend payout ratios are influenced by the relative importance of legal protection of shareholders and creditors. We find a negative and significant coefficient associated with the variable $ShareholderRights_j$, at a one percent level of confidence. These results indicate that bank managers located in countries with weaker shareholder rights pay higher dividends, as a substitute mechanism for legal protection, with the aim to bolster their reputation by signaling their unwillingness to expropriate shareholders. The results we find for banking firms are therefore markedly different from those obtained by La Porta *et al.* (2000) for non-financial firms, which find evidence in favor of the outcome hypothesis. On the other hand, the coefficient associated with the variable $CreditorRights_j$ is positive and significant at a five percent level of confidence. This is consistent with the substitution hypothesis of Brockman and Unlu (2009), as bank managers pay less dividends in countries with weak creditor rights. Such behavior will strengthen their reputation *vis-à-vis* their creditors, and might then reduce future financing costs.

Examination of the economic significance of our results shows that shareholder rights have a stronger impact than creditor rights. In particular, the estimation result in column 1 shows that a ten percent increase in the shareholder rights index corresponds to a decrease in the payout ratio of 5.42% on average, ceteris paribus.[15] On the other hand, an increase of ten percent in the creditor rights index increases the dividend payout ratio by 1.62% on average. Our results that cross-country differences in shareholder rights have a more substantial impact than those in creditor rights, are in contrast to Brockman and Unlu (2009) findings, which observe that the impact of creditor rights on dividend policy is stronger than the one of shareholder rights for non-financial firms. This difference can be explained by the unique structure of banks' funding and the pervasive safety net policies protecting creditors, as described above. First, unlike non-

[14] The Information on Disclosure Requirement Index are not available for some countries in our sample, i.e. China, Croatia, El Salvador, Ghana, Jamaica, Kazakhstan, Lithuania, Morocco, Poland, Romania, Russian Federation, Slovakia, and Ukraine.

[15] We similarly find that shareholder rights have a stronger impact than creditor rights when we consider all the other regressions presented in Table 3.

financial firms, creditors of banks cannot obtain additional control rights through formal covenants in credit agreements or by forming large syndicates. Secondly, bank's uninsured creditors might have fewer incentives to discipline managers if they anticipate that they will benefit from implicit government guarantees in the case of defaults.

Our results further show that bank and market specific factors have a significant influence on bank dividend policy. We find that banks located in countries with stronger capital stringency pay higher dividends compared to banks under less regulatory pressure. This is consistent with managers having greater scope to pay dividends when regulators apply stricter capital regulation, as creditors might not view larger dividends as an expropriation mechanism in this case. We also find that undercapitalized banks pay less dividends, possibly to satisfy their capital requirements. Furthermore, banks with a higher proportion of funding provided by uninsured debtholders distribute more dividends. This result shows that uninsured debtholders of banks are unwilling to exert pressure on managers to pay less dividends. Regarding the two external corporate mechanisms we consider, we find that banks pay higher dividends in countries with stronger competition in the banking industry, in line with the outcome hypothesis of Grullon and Michaely (2012). Our results also show that higher disclosure quality and greater capital market depth are associated with higher dividend payments.

For the other control variables, our results show that banks which are larger, more profitable and have lower growth perspectives pay higher dividends, in line with Fama and French (2001). We also find that banks give lower dividend payouts when their risk is higher. This result supports the empirical finding of Hoberg and Prabhala (2009), who also show that firms' propensity to pay dividends is lower when their risk is higher. Finally, our results demonstrate that banks pay higher dividends during crisis periods, but only when we include U.S. banks in our panel. This finding is in line with Acharya *et al.* (2009) who show that during the global financial crisis in 2007-2008, banks in the U.S. kept paying very high dividends.

Overall, our empirical results show that dividend payments are a substitute mechanism for low levels of legal protection for both shareholders and creditors. Bank managers strike a balance in their dividend policy that depends on the relative strength of the agency conflict faced by their shareholders and creditors, with however a more decisive role played by the agency cost of equity than the agency cost of debt. Our findings also show that bank funding structure, capital stringency, levels of capitalization, bank competition and financial markets characteristics have a significant influence on dividend policy of banks. We are taking our

investigation further now, by examining whether the way managers are subject to shareholders' and managers' pressures is also influenced directly by these different factors.

Table 3. Bank dividend policy, and shareholder and creditor rights over the period 2001-2014

Dependent: DP	(1)	(2)
ShareholderRights	-4.39***	-7.09***
	(-4.54)	(-4.78)
CreditorRights	2.32**	2.82**
	(2.07)	(2.18)
HighCapString	5.14***	5.60***
	(6.89)	(6.94)
HighMarketFund/TF	1.39***	1.54***
	(2.62)	(2.78)
Undercapitalized1	-4.08***	-3.82***
	(-7.78)	(-7.05)
Competitive	4.30***	4.15***
	(7.37)	(6.70)
HighCapDepth	7.19***	
	(4.35)	
HighDisclosure		5.88**
		(2.52)
Size	4.10***	5.15***
	(7.73)	(7.50)
ROA	2.16***	2.47***
	(7.39)	(7.95)
AssetGrowth	-0.05***	-0.06***
	(-3.52)	(-4.00)
LnZscore	1.62***	1.43***
	(7.42)	(6.39)
Crisis	2.45***	1.87**
	(3.02)	(2.22)
Constant	-35.59*	-42.24***
	(-1.45)	(-4.55)
Year fixed effects	Yes	Yes
No. Obs.	7336	6757
No. Banks	1148	1034
Hausman test FE vs. HT	8.5	3.65
p-value	0.902	0.997

Variable definitions: Dependent variables: DP (dividend payout) = cash dividend related to the period/earnings; ShareholderRights = Revised anti director index (Djankov at al. 2008); CreditorRights = Creditor Rights Index (Djankov et al. 2007); HighMarketFund/TF = takes the value of one if long term market funding/total funding (MarketFund/TF) is higher than the country median; HighCapString = takes the value of one if the capital stringency index (CapString) is higher than the sample median; Undercapitalized1 = takes the value of one if its equity to total assets ratio (Equity/TA) is lower than the country median; Competitive = takes the value of one if the country level Lerner Index is lower than the sample median; HighCapDepth = takes the value of one if the value of market capitalization/GDP (CapDepth) is higher than the sample median; HighDisclosure = takes the value of one if the disclosure index (Disclosure) is higher than the sample median; Size = log of total assets; ROA = Return on assets; AssetsGrowth = Annual growth of total assets; LnZScore = Log of z score, calculated over 3-year rolling windows; Crisis = dummy variable takes value of one if the country at a period of time experiencing banking crisis. t-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***.*

3.2. Impact of further bank and market specific factors

In order to examine whether additional factors might impact on the relationship between shareholder and creditor rights and dividend policy, we run further, more refined regressions, based on the specification of the first column of Table 3, using relevant subsamples of the previous data set.[16]

3.2.1. Capital stringency

We first analyze if greater capital stringency can be a substitute mechanism for dividend payments in countries with weak legal protections. If this were the case, we would expect dividend payments to be used by managers to reinforce their reputation, for both shareholders and creditors, only in countries with weak legal protection. Table 4 presents the results we obtain when we run Eq. (1) on separate samples for countries with either lower or higher capital stringency. We find a significant and positive relationship between the level of creditor rights and the dividend payout ratio, but only in countries with lower capital stringency. The substitution hypothesis between dividend payments and weak creditor rights of Brockman and Unlu (2009) that we observed as holding for the full sample now only applies in countries where capital stringency is relatively low. This is consistent with the hypothesis that high capital stringency can override managers' incentives to signal their reputation by paying less dividends in countries with weaker creditor protection. We also find that the substitution hypothesis between dividend payments and shareholder rights only holds in countries with higher levels of capital stringency. This implies that, from the perspective of shareholders, potential for managers to expropriate them is not reduced by higher degrees of capital stringency, in contrast to debtholders.

Examination of the economic significance of our results reconfirms that shareholder rights have a stronger impact than creditor rights in the case of low capital stringency. A ten percent increase in the shareholder rights index corresponds to a decrease in the payout ratio of 3.68% on average, and a similar increase in the creditor rights index increases the dividend payout ratio by 2.24% on average, *ceteris paribus*.

[16] We resort to estimations by subsamples as interaction terms are inherently difficult to manage using HT estimations.

3.2.2. Funding structure

We next examine if a larger role played by market funding has an impact on the relationship between dividend payments and legal protection of creditors and shareholders. Results on separate samples for banks with either lower or higher level of long term market funding are provided in Table 4. We again find that the substitution hypothesis between dividend payments and weak shareholder rights holds irrespective of the level of market funding. This indicates that shareholders consider that the level of market funding does not affect the willingness of managers to expropriate them. Our results further show that the substitution hypothesis between dividend payments and weak creditor rights only applies for banks with a low level of market funding. This result is not in line with the argument that a larger proportion of funds provided by uninsured debtholders might put pressure on managers to pay less dividends in countries with weaker creditor rights. However, this result might indicate that higher levels of market funding imply greater exposure to market discipline, which may reduce the importance of creditor rights, in a way similar to the one played by capital stringency. Looking at the economic significance of our results, we again find that shareholder rights have a stronger impact than creditor rights in the case of low market funding.

3.2.3. Level of capitalization

We also similarly investigate the role played by the level of capitalization in this context. The results in Table 4 show that the relationship between dividend payments and shareholder rights is not affected by the level of bank equity. Again, this result indicates that shareholders do not consider that the level of bank equity might affect the incentives of managers to engage in expropriation. However, when we consider the level of capital adequacy ratio instead of the leverage ratio, we find that the substitution hypothesis between dividend payments and weak shareholder rights only holds for banks having a regulatory capital ratio well above minimum requirements. Similarly, we find that the substitution hypothesis between dividend payments and creditor rights, holds only for banks with a relatively high level of capitalization, irrespective of the measure of capitalization used. The reason for the substitution hypothesis not holding for banks with low level of capital requirement could be that shareholders and creditors realize that managers are restrained from using dividends as a signal instrument when regulatory capital levels are low. As for the economic significance of our results, we again observe that shareholder rights have a stronger impact than creditor rights when levels of capitalization are high.

Table 4. Bank dividend policy, shareholder and creditor rights, and further additionnal factors over the period 2001-2014

Dependent: DP	Capital stringency		Market funding		Capitalization		TCR	
	High	Low	High	Low	High	Low	High	Low
ShareholderRights	-6.73***	-1.59	-3.88***	-3.87***	-4.96***	-3.56***	-3.57***	-2.26
	(-3.92)	(-1.50)	(-2.86)	(-3.27)	(-3.91)	(-2.60)	(-3.18)	(-1.10)
CreditorRights	1.99	3.45***	-0.19	4.06***	3.29**	0.14	3.42***	3.76
	(1.18)	(2.89)	(-0.12)	(3.11)	(2.33)	(0.09)	(2.81)	(1.16)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. Obs.	4763	2573	3428	3908	3700	3636	6254	296
No. Banks	872	692	806	837	859	815	1042	149
Hausman test FE vs. HT	6.38	9.86	6.64	9.6	14.17	11.76	22.3	4.12
p-value	0.956	0.772	0.967	0.844	0.512	0.697	0.11	0.997

This table reports subsamples Hausman-Taylor estimations based on level of bank capital stringency, market funding, and bank capitalization. We categorize a country into high capital stringency regulation subsample if its capital stringency index (CapString) is higher than the sample median. We consider a bank with a high level of market funding if its long term funding to total funding ratio (MarketFund/TF) is higher than the country median. We consider a bank with a high level of capitalization when its equity to total assets ratio (Equity/TA) is higher than the country median. We consider a bank with a low total regulatory capital ratio (TCR) when its TCR is lower than the country regulatory threshold plus two percent. Variable definitions: Dependent variables: DP (dividend payout) = cash dividend related to the period/earnings; ShareholderRights = Revised anti director index (Djankov at al. 2008); CreditorRights = Creditor Rights Index (Djankov et al. 2007); t-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***.*

Table 5. Bank dividend policy, shareholder and creditor rights, and further aditionnal factors over the period 2001-2014

Dependent: DP	Competition		Capital Depth		Disclosure	
	High	Low	High	Low	High	Low
ShareholderRights	-3.69***	-4.47***	-11.29***	-5.72***	-14.53***	-4.86*
	(-2.84)	(-4.07)	(-3.68)	(-3.75)	(-4.38)	(-1.94)
CreditorRights	3.74***	1.25	4.80**	-1.12	7.85***	-2.52
	(2.76)	(0.93)	(2.14)	(-0.53)	(3.20)	(-0.99)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
No. Obs.	3061	4275	5552	1814	5791	966
No. Banks	903	1005	821	327	848	186
Hausman test FE vs. HT	9.47	15.97	2.95	18.18	3.28	12.38
p-value	0.852	0.384	0.99	0.254	0.998	0.65

This table reports subsamples Hausman-Taylor estimations based on level of competition, capital depth, and disclosure requirement. We categorize a country into high competition subsample if its country level Lerner index is lower than the sample median. We consider a country into high capital depth if its ratio of market capitalization to GDP (CapDepth) is higher than the sample median. We consider a country into high disclosure requirement of its disclosure requirement index (Disclosure) is higher than the sample median. Variable definitions: DP (dividend payout) = cash dividend related to the period/earnings; ShareholderRights = Revised anti director index (Djankov at al. 2008); CreditorRights = Creditor Rights Index (Djankov et al. 2007); t-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***.*

3.2.4. Competition

We now further investigate the role of competition in the banking industry as an external corporate governance mechanism, which, as outlined above, could either complement or substitute for legal rights in the disciplining of managers.

Our results in Table 5 indicate that the degree of competition in national banking markets does not have any impact on the relationship between dividend payments and shareholder rights. This is in contrast to Knyazeva and Knyazeva (2012) who find that complementarities between product market competition and shareholder rights exist for non-financial firms. However, creditor rights have an influence on dividend policy only in the presence of a competitive environment. This could be explained by the fact that the quality of managerial decisions will be more transparent in a competitive environment, thereby acting as a complement to legal protections that allow creditors to take action against underperforming managers. In terms of economic significance of our results, shareholder rights again have a stronger impact than creditor rights for high degrees of competition.

3.2.5. Financial market characteristics

We finally examine the impact of well-functioning financial markets on the relationship between dividend payments and shareholder and creditor rights.

The results in Table 5 highlight that once again the impact of shareholder rights on dividend payments does not depend on either the level of capital development or disclosure quality; this suggests that well-functioning financial markets are neither a substitute nor a complement to shareholder protection. In contrast, our results show that creditor rights have a significant and positive influence on dividend payments only in countries with higher levels of capital development or disclosure quality, consistent with the hypothesis of a complementary relationship between well-functioning financial markets and strong creditor rights. Looking at the economic significance of our results, we again find that shareholder rights have a stronger impact than creditor rights.

To sum up, the results show that dividend payments are substitute mechanisms for low levels of shareholder protection, independently of bank funding structure, functioning of financial markets or competition in the banking market. This shows that for shareholders, the potential to be expropriated by managers is not reduced by any of these factors. On the other hand, we find that dividend payments can be used as substitute mechanisms for low levels of creditor protection only in the presence of either strong competition in the banking market or well-

functioning financial markets. We furthermore find that higher levels of capital stringency and higher exposure to debtholders' disciplining behavior act as substitute mechanisms for creditor protection, but not for shareholder protection.

4. Further issues and robustness checks

4.1. Extensions

We now examine several additional factors that could also have an impact on how dividend payments are influenced by the relative importance of legal protection of shareholders and creditors.

First, as highlighted by Claessens and Yurtoglu (2013), while the formal definition of property rights matters, the degree of enforcement of these rights is also an important determinant of the strength of conflicts of interest between managers and their stakeholders; this could therefore have an impact on the relationship between dividend policy and shareholder and creditor rights. To examine that, we use two alternative indexes to measure the quality of enforcement of legal rights in the judicial system: an index measuring the quality of law enforcement (the rule of law index from Worldwide Governance Indicators (World Bank)) and an index of the efficiency of debt enforcement computed by Djankov *et al.* (2008). The rule of law index, ROL_{jt} reflects perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts; it ranges from -2.5 to 2.5, with a higher index indicating stronger law enforcement. The efficiency of debt enforcement index, $DebtEnforcement_j$ is computed using detailed information on collateral systems, structure of appeals, efficiency of votes among creditors, and bankruptcy systems. It ranges from 0 (weak enforcement) to 100 (strong enforcement).

As previously, we run Eq. (1) using subsamples based on high and low values of each index; results are presented in Table 6. We find a positive relationship between dividend payments and creditor rights, but only in countries with either higher levels of quality of law enforcement or higher efficiency of debt enforcement. Higher levels of legal rights enforcement are therefore a complement to creditor rights in disciplining managers. Our results also show that the substitution hypothesis between dividend payments and weak shareholder rights holds in countries with either high or low levels of legal rights enforcement; this indicates that for shareholders the potential for managers to expropriate them is not reduced by higher quality of law enforcement more generally.

Table 6. Subsample regression based on rule of law and debt enforcement over the period 2001-2014.

Dependent: DP	Rule of Law		DebtEnforcement	
Level of Rule of Law:	High	Low	High	Low
ShareholderRights	-6.88***	-6.41***	-6.14***	-9.23***
	(-3.09)	(-3.47)	(-2.54)	(-3.37)
CreditorRights	6.10***	-2.11	4.62**	-0.12
	(3.22)	(-0.75)	(2.05)	(-0.04)
Year fixed effects	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
No. Obs.	5898	1438	5758	1177
No. Banks	900	265	866	222
Hausman test FE vs. HT	4.77	25.12	5.06	23.01
p-value	0.994	0.05	0.991	0.1

This table reports subsample Hausman-Taylor estimation based on rule of law and debt enforcement. We categorize a country into high rule of law subsample if its Rule of Law score (ROL) is greater than the sample median. We categorize a country into high debt enforcement subsample if its debt enforcement efficiency index (DebtEnforcement) is higher than the sample median. Variable definitions: Dependent variables: DP (dividend payout) = cash dividend related to the period/earnings; ShareholderRights = Revised anti director index (Djankov at al. 2008); CreditorRights = Creditor Rights Index (Djankov et al. 2007). t-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***.*

Secondly, we use two other alternative indices to measure if financial markets are well-functioning and efficient. We use the turnover ratio, defined as the ratio of the value of total shares traded to market capitalization, to measure the efficiency of the stock market ($CapEfficiency_{jt}$). Higher turnover compared to capitalization represents relatively higher volumes of trading in the market, and thus more liquidity and greater scope for price discovery, improved transmission of information through prices, and greater market efficiency. We also use a synthetic measure of corporate governance quality, the Corporate Governance Quality index (CGQ_j) by De Nicolò *et al.* (2008). This country-level index is an average of three proxies of accounting disclosure and transparency that reflects how accounting statements are being provided, how earnings are being smoothed, and how stock prices behave and reflect information about the firm.[17]

While we find that the substitution hypothesis between dividend payments and weak shareholder rights holds both in countries with high and low levels of financial market efficiency, this hypothesis only holds in countries with a low quality of corporate governance (see Table 7). This result might indicate that incentives for managers to pay high dividends to shareholders, to signal they will not be expropriated, may act as a substitute mechanism in

[17] As this index was only computed for the 1999-2003 period, we use the value of the index for the last year available in 2003.

environments with weak corporate governance quality. We furthermore find a positive relationship between dividend payments and creditor rights, but only in countries with either higher financial market efficiency or stronger quality of corporate governance, indicating a complementary relationship between these two factors and strong creditor rights.

Table 7: Subsample regression based on capital market efficiency and corporate governance quality over the period 2001-2014.

Dependent: DP	Capital Market Efficiency		Corporate Governance Quality	
	High	Low	High	Low
ShareholderRights	-2.85**	-4.55**	1.63	-4.59***
	(-2.28)	(-1.94)	(0.62)	(-4.19)
CreditorRights	2.65**	-2.95	4.33**	1.43
	(2.12)	(1.13)	(2.38)	(0.93)
Year fixed effects	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
No. Obs.	6669	667	5226	1917
No. Banks	1110	173	826	297
Hausman test FE vs. HT	2.95	18.17	3.2	16.16
p-value	0.99	0.254	0.99	0.378

This table reports subsample Hausman-Taylor estimation based on capital market efficiency and corporate governance quality. We categorize a country into high capital market efficiency if the value of total share traded to market capitalization (CapEfficiency) is higher than the sample median. We categorize a country into high corporate governance subsample if its corporate governance opacity index (CGQ) is higher than the sample median. Variable definitions: Dependent variables: DP (dividend payout) = cash dividend related to the period/earnings; ShareholderRights = Revised anti director index (Djankov at al. 2008); CreditorRights = Creditor Rights Index (Djankov et al. 2007). t-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***.*

Thirdly, we also investigate whether the balancing strategy of managers' dividend policy between shareholder and creditor interests is different during crisis periods compared to normal periods. As already explained in Section 3.1., we define a crisis period as one where a country experiences a banking crisis. Results in Table 8 show a negative and significant impact of shareholder rights on bank dividend payments both during crisis and non-crisis periods, indicating that incentives of managers to use dividends to signal minority shareholders they will not be expropriated are effective in both normal and troubled times. However, we find evidence in line with the substitution hypothesis between dividend payments and weak creditor rights only in normal times, indicating that during banking crisis, managers do not use dividends as a corporate governance mechanism to reassure creditors they will not transfer wealth to shareholders through higher dividends. This result might indicate that during crisis periods, either creditors do not pressure managers to cut dividends, or managers do not consent to use dividends to build their reputation in financial markets. The presence of a deposit insurance

scheme or implicit government guarantees might furthermore weaken incentives of creditors to pressure on managers, as creditors might be confident they will recover their claims in cases of bank default.

Table 8. Subsample regression based on crisis vs non-crisis and Z-score over the period 2001-2014.

Dependent: DP	Crisis		Z Score	
Crisis:	Yes	No	High	Low
ShareholderRights	3.91	-4.26***	-6.04***	-3.93***
	(0.73)	(-4.42)	(-4.51)	(-3.80)
CreditorRights	5.80	2.27**	0.78	2.99**
	(1.50)	(2.08)	(0.52)	(2.41)
Year fixed effects	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
No. Obs.	1688	5668	3671	3665
No. Banks	569	1123	915	964
Hausman test FE vs. HT	2.79	8.93	5.3	19.78
p-value	0.733	0.835	0.989	0.181

This table reports subsample Hausman-Taylor estimation based on crisis vs non-crisis period and level of z score. We define crisis as the period of a country experiencing banking crisis, as in Global Financial Development Database of the World Bank. We categorize a bank into high z score subsample if its z score is higher than the country median. Variable definitions: Dependent variables: DP (dividend payout) = cash dividend related to the period/earnings; ShareholderRights = Revised anti director index (Djankov at al. 2008); CreditorRights = Creditor Rights Index (Djankov et al. 2007) t-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***.*

Finally, we also investigate if the level of bank default risk shapes the influence of legal rights on dividend policy. As paying dividends affects the ability of banks to build solid capital buffers (Acharya *et al.* 2013; Onali *et al.* 2015), creditors might fear an increase in risk leading to a bank's default. In weak legal protection environments, managers of banks with a high level of default risk may have stronger incentives to cut dividends to reinforce their regulatory capital. By contrast, these incentives could be weaker for banks with a low level of risk. In this case, creditors are more confident to recover their claims and do not consider dividend payments as an expropriation process. We find a negative and significant impact of shareholder rights on dividend payments for both banks with high and low default risk (see Table 8). However, the effect of creditor rights on dividend payout ratios is only significant for banks with higher default risk (the low Z-score subsample). This result indicates that in weak creditor rights environments, managers of riskier banks have greater incentives to cut dividends to signal creditors that they will not be expropriated. When bank default risk is lower, creditors are more confident to be paid back their claims, and thus do not view the payment of dividends as a transfer of wealth.

4.2. Robustness checks

We carry out several additional robustness checks on our empirical results. First, we use the ratio dividends to total assets (Div/TA_{ijt}) as an alternative variable to measure the dividend payout. Tables A4-A6 in Appendix A shows that we obtain similar results to those obtained in Tables 3 to 5 when we use this alternative measure as dependent variable.

We then control for additional institutional and financial market features in the baseline regressions used in Table 3, including the rule of law, corporate governance quality and financial market efficiency. We also use the growth rate of total loans instead of the growth rate of total assets to measure investment opportunities of banks, as in Kanas (2013) and Onali (2014). Again, our results remain unchanged.[18]

We further examine if our results regarding the role played by market funding in the relationship between dividend payments and legal protection of creditor changes when we consider both long term and short term market funding. The results are similar to those obtained before, where we only considered long term market funding (see Table A7 in Appendix A).

Finally, we test whether our results are driven by the large presence of U.S., Japanese and Russian banks. We create three subsamples: Panel A that excludes U.S. banks, Panel B that excludes Japanese banks, and Panel C that excludes Russian bank. We rerun our Eq. (1) for the full (as in Table 3) and different subsamples considered in Section 3 (as in Table 4 and 5). These estimations are reported in Tables A8-A14 (Appendix A); we obtain results that are very similar to our previous findings.

5. Conclusion

We empirically investigate whether banks' dividend payments depend on the relative strength of the various agency conflicts occurring between different stakeholders. More specifically, we analyze whether shareholder and creditor rights are significant determinant of banks' dividend policy around the world, and to what extent this relationship is shaped by banks' specific funding structure and the regulatory environment faced by the banking industry. We carry out this investigation using a panel of 1,153 banks from 51 countries over the 2001-2014 period.

[18] The estimation results not included in this section are available on request.

We find that both shareholder and creditor rights significantly influence banks' dividend policy. Our results are consistent with the substitution hypothesis between dividend payments and both weak shareholder and creditor rights. These two results indicate that managers use dividends as a corporate governance mechanism to signal their unwillingness to expropriate either shareholders or creditors when their respective legal rights are weak. Looking at the economic significance of these two effects, we find that shareholders rights have a more substantial impact on dividend policy than creditor rights. This result, robust to various specifications, is in contrast to what it is observed for non-financial firms; it can be explained by the unique structure of banks' funding and the pervasive safety net policies protecting creditors.

Furthers investigations show that dividend policy can be used as a substitute mechanism to weak creditor rights only in the presence of either strong competition in the banking market, well-functioning financial markets with strong levels of development and high disclosure quality, or strong levels of legal rights enforcement. On the other hand, higher exposure to market discipline and stricter capital stringency act as a substitute mechanism to dividend policy when creditor rights are weak. Regarding the pressure exerted by shareholders on managers, we find that the substitution hypothesis between dividend payments and weak shareholder rights holds independently of the competitive environment, financial markets characteristics and banks' funding structure. In other words, shareholders do not consider that these different factors affect the incentives of managers to engage in expropriation. This could be explained by it being more difficult for shareholders to detect expropriation behavior in financial firms compared to non-financial firms, due to their inherent opacity. We furthermore find there is no significant impact of shareholder and creditor rights on dividend payments for banks with low capital adequacy ratios, indicating that shareholders and creditors realize that managers are restrained from using dividends as a signaling instrument when regulatory capital levels are low.

Overall our study contributes to the corporate payout literature by showing the existence of the substitution hypothesis based on the agency costs of equity and of debt for the important realm of financial firms. Our study highlights that bank managers strike a balance in their dividend policy that depends, not only, on the relative strength of the agency conflicts faced by their shareholders and creditors, with a more decisive role played by the agency cost of equity than the one of debt, but also on a variety of bank and market specific factors and the institutional environment. Our results for financial firms are opposite to the ones found in the literature on non-financial firms, where creditors play a more determinant role than shareholders in dividend

policy decisions. This striking difference can be explained by the fact that banks are "special" in the sense that they benefit from pervasive safety net policies protecting creditors, and also that creditors of banks, unlike those of non-financial firms, cannot obtain additional control rights through formal covenants in credit agreements or by forming large syndicates.

The stronger pressure exerted by shareholders on the dividend decisions of managers, relative to the one of debtholders, could be viewed as harmful for banks as the interests of shareholders, unlike those of debtholders, are not generally aligned with the preferences of regulators and deposit insurers. Shareholders, particularly in countries with weak shareholder rights, prefer earnings to be distributed as dividends, reducing banks' ability to generate capital internally with a potential transfer of default risk to creditors and the deposit insurer. As our findings, however, show that undercapitalized banks do not appear to face pressures from shareholders to use dividends as a signalling mechanism, this stronger influence of shareholders on banks' dividend policy might not pose a substantial risk for banks' financial health from a prudential standpoint, and thus mitigate the need to redress this balance with further regulatory intervention.

Appendix A

Table A1. Distribution of banks by country and summary statistics for the period of 2001 – 2014

Country Name	No. of Banks	Obs.	DP (%)	Shareholder Rights	Creditor Rights	CapString
Australia	10	71	66.79	4	3	10
Austria	7	49	17.21	2.5	3	5
Belgium	3	12	32.09	3	2	5.5
Canada	8	60	39.99	4	1	7
China	11	61	22.36	1	2	6
Croatia	4	16	48.50	2.5	3	9
Denmark	24	116	22.08	4	3	7
Ecuador	2	16	31.62	2	0	8
Egypt	7	27	39.93	3	2	9
El Salvador	3	12	21.32	2	3	6
France	22	109	19.09	3.5	0	9
Germany	6	21	24.01	3.5	3	8
Ghana	3	17	50.00	5	1	7
Hong Kong	5	46	38.04	5	4	7
India	34	264	20.09	5	2	10
Indonesia	17	89	30.09	4	2	10
Ireland	3	17	18.97	5	1	5
Israel	5	23	11.09	4	3	9
Italy	17	66	33.91	2	2	7
Jamaica	2	10	32.06	4	2	10
Japan	84	685	20.83	4.5	2	8
Jordan	6	32	42.15	1	1	10
Kazakhstan	7	25	3.63	4	2	9
Kenya	7	54	30.68	2	4	7
Lithuania	4	24	4.83	4	2	7
Malaysia	7	42	26.03	5	3	5
Morocco	5	20	44.01	2	1	9
Netherlands	4	13	41.68	2.5	3	9
Nigeria	9	38	47.01	4	4	5
Norway	18	92	22.59	3.5	2	8
Pakistan	7	28	30.60	4	1	9
Peru	3	25	45.00	3.5	0	9
Philippines	8	68	24.17	4	1	9
Poland	11	50	37.13	2	1	9
Portugal	3	24	36.68	2.5	1	8
Republic of Korea	10	52	22.19	4.5	3	7
Romania	3	19	36.36	5	1	9
Russian Federation	55	289	0.00	4	2	8
Singapore	7	45	39.07	5	3	8
Slovakia	2	13	61.25	3	2	7
South Africa	5	40	35.52	5	3	6
Spain	14	81	33.80	5	2	9

Sri Lanka	7	47	19.15	4	2	6
Sweden	2	22	42.90	3.5	1	4
Switzerland	11	61	42.30	3	1	8
Taiwan	13	37	37.67	3	2	8
Thailand	8	46	35.96	4	2	10
Turkey	11	60	13.18	3	2	11
Ukraine	4	23	0.00	3	2	9
United Kingdom	9	51	42.99	5	4	8
United States	611	4,128	28.23	3	1	9
Full sample median	7	42	32.06	4	2	8
Total	1148	7336				

DP (dividend payout) = cash dividend related to the period/earnings; Shareholder Rights = Revised anti director index (Djankov at al. 2008); Creditor Rights = Creditor Rights Index (Djankov et al. 2007); CapString = Capital stringency index (CapString)

Table A2. Correlation matrix

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	*ShareholderRights*	1.00													
2	*CreditorRights*	0.50*	1.00												
3	*HighCapString*	-0.30*	-0.48*	1.00											
4	*HighMarketFund/TF*	-0.02	-0.02	0.02	1.00										
5	*Undercapitalized1*	-0.01	-0.01	0.01	0.07*	1.00									
6	*Competitive*	0.07*	0.04*	-0.04*	0.01	0.00	1.00								
7	*HighCapDepth*	-0.16*	-0.44*	0.21*	0.02	0.01	-0.16*	1.00							
8	*HighCapEfficiency*	-0.06*	-0.25*	0.15*	0.03*	-0.01	-0.04*	0.50*	1.00						
9	*HighDisclosure*	0.04*	-0.38*	0.20*	0.03*	-0.00	-0.09*	0.65*	0.34*	1.00					
10	*Size*	0.30*	0.34*	-0.26*	0.10*	0.07*	0.00	-0.14*	-0.04*	-0.21*	1.00				
11	*ROA*	0.02	0.11*	-0.03*	-0.00	-0.14*	-0.01	-0.25*	-0.21*	-0.18*	0.04*	1.00			
12	*AssetGrowth*	0.05*	0.11*	-0.02	-0.01	-0.06*	0.02*	-0.26*	-0.18*	-0.08*	-0.04*	0.22*	1.00		
13	*Ln Zscore*	-0.04*	-0.09*	0.05*	-0.04*	-0.11*	-0.09*	0.13*	0.08*	0.08*	-0.00	0.27*	0.02	1.00	
14	*Crisis*	-0.17*	-0.18*	0.20*	0.00	-0.02	0.42*	0.13*	0.10*	0.07*	-0.14*	-0.21*	-0.12*	-0.19*	1.00

*Variable definitions: Dependent variables: DP (dividend payout) = cash dividend related to the period/earnings; ShareholderRights = Revised anti director index (Djankov at al. 2008); CreditorRights = Creditor Rights Index (Djankov et al. 2007); HighMarketFund/TF = takes the value of one if long term market funding/total funding (MarketFund/TF) is higher than the country median; HighCapString = takes the value of one if the capital stringency index (CapString) is higher than the sample median; Undercapitalized = takes the value of one if the value of equity/total assets (Equity/TA) is lower than the country median; Competitive = takes the value of one if the country level Lerner Index is lower than the sample median; HighCapDepth = takes the value of one if the value of market capitalization/GDP (CapDepth) is greater than the sample median; HighCapEfficiency = takes the value of one if the value of total share traded to market capitalization (CapEfficiency) is greater than the sample median; HighDisclosure = takes the value of one if the disclosure index (Disclosure) is greater than the sample median; size = log of total assets; ROA = Return on assets; AssetsGrowth = Annual growth of total assets; Ln Z Score = Log of z score, calculated over 3-year rolling windows; Crisis = dummy variable takes value of one if the country at a period of time experiencing banking crisis. p<0.05**

Table A3. Baseline regression, FE, RE, and HT estimation.

Dependent: *DP*	FE	RE	HT
ShareholderRights		-3.94***	-4.39***
		(-5.95)	(-4.54)
CreditorRights		3.79***	2.32**
		(4.25)	(2.07)
HighCapString	4.75***	4.32***	5.14***
	(3.68)	(4.15)	(6.89)
HighMarketFund/TF	1.40**	1.30**	1.39***
	(2.20)	(2.27)	(2.62)
Undercapitalized1	-4.06***	-4.31***	-4.08***
	(-5.26)	(-6.33)	(-7.78)
Competitive	4.35***	3.81***	4.30***
	(6.45)	(5.98)	(7.37)
HighCapDepth		6.97***	7.19***
		(5.44)	(4.35)
Size	2.11***	2.78***	2.16***
	(5.86)	(8.57)	(7.39)
ROA	3.29**	2.03***	4.10***
	(2.49)	(8.11)	(7.73)
AssetGrowth	-0.05***	-0.09***	-0.05***
	(-2.86)	(-5.80)	(-3.52)
LnZscore	1.62***	2.20***	1.62***
	(5.55)	(8.39)	(7.42)
Crisis	2.69**	2.01**	2.45***
	(2.55)	(1.97)	(3.02)
Constant	-35.59*	-15.44***	-42.24***
	(-1.45)	(-2.60)	(-4.55)
Year fixed effects	Yes	Yes	Yes
No. Obs.	7336	7336	7336
No. Banks	1148	1148	1148
R-squared within	0.11	0.11	
R-squared between	0.11	0.21	
R-squared overall	0.10	0.16	
Hausman test FE vs. RE		200.1	
p-value		0.000	
Hausman test FE vs. HT			8.5
p-value			0.902

This table reports Fixed Effects (FE), Random Effects (RE), and Hausman-Taylor (HT) estimation.Variable definitions: Dependent variables: DP (dividend payout) = cash dividend related to the period/earnings; ShareholderRights = Revised anti director index (Djankov at al. 2008); CreditorRights = Creditor Rights Index (Djankov et al. 2007); HighMarketFund/TF = takes the value of one if long term market funding/total funding (MarketFund/TF) is higher than the country median; HighCapString = takes the value of one if the capital stringency index (CapString) is higher than the sample median; Undercapitalized = takes the value of one if its equity to total assets ratio (Equity/TA) is lower than the country median; Competitive = takes the value of one if the country level Lerner Index is lower than the sample median; HighCapDepth = takes the value of one if the value of market capitalization/GDP (CapDepth) is higher than the sample median; Size = log of total assets; ROA = Return on assets; AssetsGrowth = Annual growth of total assets; LnZScore = Log of z score, calculated over 3-year rolling windows; Crisis = dummy variable takes value of one if the country at a period of time experiencing banking crisis. t-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***.*

Table A4. Bank dividend policy, and shareholder and creditor rights over the period 2001-2014

Dependent: *Div/TA*	(1)	(2)
ShareholderRights	-0.05***	-0.06***
	(-3.46)	(-3.12)
CreditorRights	0.03*	0.05***
	(1.80)	(3.07)
HighCapString	-0.01	-0.00
	(-0.65)	(-0.46)
HighMarketFund/TF	0.00	-0.00
	(0.15)	(-0.07)
Undercapitalized	-0.03***	-0.03***
	(-5.50)	(-5.12)
Competitive	0.03***	0.02***
	(3.92)	(3.31)
HighCapitalDepth	-0.02	
	(-0.77)	
HighCapEfficiency		
HighDisclosure		-0.05*
		(-1.66)
Size	0.02	-0.00
	(1.60)	(-0.10)
ROA	0.07***	0.08***
	(20.60)	(23.37)
AssetGrowth	-0.00***	-0.00***
	(-6.31)	(-6.68)
Ln Zscore	0.01***	0.01***
	(5.24)	(3.76)
Crisis	-0.01	-0.01
	(-0.56)	(-1.29)
Constant	0.29***	0.33***
	(5.36)	(5.92)
Year fixed effects	Yes	Yes
No. Obs.	7851	7457
No. Banks	1155	1047
Hausman test FE vs. HT	8.5	3.65
p-value	0.902	0.997

Variable definitions: Dependent variables: Div/TA = cash dividend related to the period/total assets; ShareholderRights = Revised anti director index (Djankov at al. 2008); CreditorRights = Creditor Rights Index (Djankov et al. 2007); HighMarketFund/TF = takes the value of one if long term market funding/total funding (MarketFund/TF) is higher than the country median; HighCapString = takes the value of one if the capital stringency index (CapString) is higher than the sample median; Undercapitalized = takes the value of one if the value of equity/total assets (Equity/TA) is lower than the country median; Competitive = takes the value of one if the country level Lerner Index is lower than the sample median; HighCapDepth = takes the value of one if the value of market capitalization/GDP (CapDepth) is higher than the sample median; HighDisclosure = takes the value of one if the disclosure index (Disclosure) is higher than the sample median; Size = log of total assets; ROA = Return on assets; AssetsGrowth = Annual growth of total assets; Ln Z Score = Log of z score, calculated over 3-year rolling windows; Crisis = dummy variable takes value of one if the country at a period of time experiencing banking crisis. t-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***.*

Table A5. Bank dividend policy, shareholder and creditor rights, and further additional factors over the period 2001-2014

Dependent: *Div/TA*	Capital stringency		Market funding		Capitalization		TCR	
	High	Low	High	Low	High	Low	High	Low
ShareholderRights	-0.10***	-0.03*	-0.05**	-0.05***	-0.06***	-0.05***	-0.04**	-0.01
	(-4.66)	(-1.77)	(-2.57)	(-2.60)	(-2.93)	(-2.99)	(-2.27)	(-0.38)
CreditorRights	0.01	0.06***	-0.02	0.05**	0.04*	-0.01	0.03*	0.04
	(0.26)	(2.78)	(-0.93)	(2.40)	(1.75)	(-0.71)	(1.87)	(0.81)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. Obs.	5157	2694	3741	4110	3989	3862	6690	307
No. Banks	872	700	817	845	869	826	1046	156
Hausman test FE vs. HT	21.81	12.98	3741	19.33	21.58	13.08	17.4	4.35
p-value	0.149	0.674	817	0.199	0.115	0.596	0.295	0.996

This table reports subsamples Hausman-Taylor estimations based on level of bank capital stringency, market funding, and bank capitalization. We categorize a country into high capital stringency regulation subsample if its capital stringency index (CapString) is higher than the sample median. We consider a bank with a high level of market funding if its long term funding to total funding ratio (MarketFund/TF) is higher than the country median. We consider a bank with a high level of capitalization when its equity to total assets ratio (Equity/TA) is higher than the country median. We consider a bank with a low total regulatory capital ratio (TCR) when its TCR is lower than the country regulatory threshold plus two percent. Variable definitions: Dependent variables: Div/TA = cash dividend related to the period/total assets; ShareholderRights = Revised anti director index (Djankov at al. 2008); CreditorRights = Creditor Rights Index (Djankov et al. 2007); t-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***.*

Table A6. Bank dividend policy, shareholder and creditor rights, and further additional factors over the period 2001-2014

Dependent: *Div/TA*	Competition		Capital Depth		Disclosure	
	High	Low	High	Low	High	Low
ShareholderRights	-0.06***	-0.06***	-0.16***	-0.04*	-0.26***	-0.04
	(-3.10)	(-3.52)	(-4.88)	(-1.92)	(-7.00)	(-0.99)
CreditorRights	0.04*	-0.01	0.09***	-0.02	0.14***	-0.02
	(1.93)	(-0.57)	(3.31)	(-0.67)	(4.98)	(-0.47)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
No. Obs.	3446	4405	6053	1798	6307	973
No. Banks	925	1011	828	327	855	186
Hausman test FE vs. HT	13.3	15.97	22.23	15.3	9.38	6.37
p-value	0.184	0.384	0.102	0.502	0.856	0.97

This table reports subsamples Hausman-Taylor estimations based on level of competition, capital depth, and disclosure requirement. We categorize a country into high competition subsample if its country level Lerner index is lower than the sample median. We consider a country into high capital depth if its ratio of market capitalization to GDP (CapDepth) is higher than the sample median. We consider a country into high disclosure requirement of its disclosure requirement index (Disclosure) is higher than the sample median. Variable definitions: Div/TA = cash dividend related to the period/total assets; ShareholderRights = Revised anti director index (Djankov at al. 2008); CreditorRights = Creditor Rights Index (Djankov et al. 2007); t-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***.*

Table A7. Subsample regression based on proportion of total market funding

Dependent: *DP*	Total Market Funding	
	High	Low
ShareholderRights	-3.69***	-4.23***
	(-2.69)	(-3.34)
CreditorRights	-0.23	4.77***
	(-0.16)	(3.37)
Year fixed effects	Yes	Yes
Controls	Yes	Yes
No. Obs.	3630	3706
No. Banks	809	808
Hausman test FE vs. HT	4.93	6.07
p-value	0.992	0.978

This table reports subsample Hausman-Taylor estimation based on the proportion of total market funding. We define a bank into high total market funding subsample if the ratio of long term + short term market funding/total funding is greater than the country median. Variable definitions: Dependent variables: DP (dividend payout) = cash dividend related to the period/earnings; ShareholderRights = Revised anti director index (Djankov at al. 2008); CreditorRights = Creditor Rights Index (Djankov et al. 2007) t-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***.*

Table A8 Bank dividend policy, and shareholder and creditor rights over the period 2001-2014.

Dependent: DP	Panel A (without U.S.)		Panel B (without Japan)		Panel C (without Russian Federation)	
ShareholderRights	-4.16***	-4.01***	-4.39***	-7.09***	-4.16***	-4.01***
	(-4.37)	(-2.90)	(-4.54)	(-4.78)	(-4.37)	(-2.90)
CreditorRights	2.14**	2.47**	2.32**	2.82**	2.14**	2.47**
	(2.12)	(2.23)	(2.07)	(2.18)	(2.12)	(2.23)
HighCapString	1.07	0.30	2.65***	2.65***	4.51***	5.60***
	(1.12)	(0.29)	(3.41)	(3.12)	(5.73)	(6.94)
HighMarketFund/TF	1.03	1.37*	1.30**	1.50**	1.37**	1.54***
	(1.38)	(1.70)	(2.29)	(2.51)	(2.51)	(2.78)
Undercapitalized	-4.21***	-3.66***	-4.06***	-3.76***	-4.02***	-3.82***
	(-5.31)	(-4.22)	(-7.44)	(-6.63)	(-7.47)	(-7.05)
Competitive	2.34***	2.23**	4.47***	4.56***	4.38***	4.15***
	(2.83)	(2.53)	(6.93)	(6.44)	(7.20)	(6.70)
HighCapDepth	6.43***		9.05***		5.87***	
	(2.58)		(5.17)		(3.26)	
HighDisclosure		0.32		4.87**		5.88**
		(0.13)		(2.12)		(2.52)
Size	2.74***	3.73***	3.12***	3.40***	4.17***	5.15***
	(3.76)	(3.99)	(5.49)	(4.67)	(7.07)	(7.50)
ROA	1.41***	2.26***	2.27***	2.60***	2.57***	2.47***
	(2.88)	(3.71)	(7.63)	(8.18)	(8.34)	(7.95)
Asset growth	-0.06***	-0.09***	-0.04***	-0.05***	-0.06***	-0.06***
	(-2.60)	(-3.17)	(-2.80)	(-3.12)	(-4.10)	(-4.00)
LnZscore	0.98***	0.47	1.96***	1.78***	1.49***	1.43***
	(2.82)	(1.27)	(8.30)	(7.28)	(6.65)	(6.39)
Crisis	-1.37	-1.28	2.30**	1.66*	2.69***	1.87**
	(-1.11)	(-0.87)	(2.43)	(1.65)	(3.23)	(2.22)
Constant	6.01	-15.68	-31.89***	-27.65***	-41.53***	-48.70***
	(0.24)	(-1.22)	(-3.66)	(-2.71)	(-4.87)	(-5.28)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
No. Obs.	3208	2629	6651	6072	7047	6757
No. Banks	537	423	1064	950	1093	1034
Hausman test FE vs. HT	16.78	3.84	11.07	5.61	4.93	3.65
p-value	0.332	0.996	0.211	0.985	0.992	0.998

Variable definitions: Dependent variables: DP (dividend payout) = cash dividend related to the period/earnings; ShareholderRights = Revised anti director index (Djankov at al. 2008); CreditorRights = Creditor Rights Index (Djankov et al. 2007); HighMarketFund/TF = takes the value of one if long term market funding/total funding is higher than the country median; HighCapString = takes the value of one if the capital stringency index (Barth et al. 2013) is higher than the sample median; Undercapitalized = takes the value of one if the value of equity/total assets is lower than the country median; Competitive = takes the value of one if the country level Lerner Index is lower than the sample median; HighCapDepth = takes the value of one if the value of market capitalization/GDP is greater than the sample median; HighDisclosure = takes the value of one if the disclosure index (World Bank) is greater than the sample median; size = log of total assets; ROA = Return on assets; Assets growth = Annual growth of total assets; LnZScore = Log of z score, calculated over 3-year rolling windows; Crisis = dummy variable takes value of one if the country at a period of time experiencing banking crisis. t-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***.*

Table A9 Panel A. Bank dividend policy, shareholder and creditor rights, and further additional factors over the period 2001-2014, without U.S.

Dependent: *DP*	Capital stringency		Market funding		Capitalization		TCR	
	High	Low	High	Low	High	Low	High	Low
ShareholderRights	-3.70*	-2.77**	-2.07*	-4.27***	-3.60***	-3.29***	-5.63***	-2.19
	(-1.75)	(-2.05)	(-1.67)	(-3.76)	(-2.90)	(-2.61)	(-3.59)	(-0.73)
CreditorRights	3.02	3.21***	0.67	3.16***	2.80**	0.81	2.75*	3.52
	(1.42)	(2.67)	(0.53)	(2.67)	(2.27)	(0.64)	(1.68)	(1.12)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. Obs.	1153	2055	1439	1769	1642	1566	1254	226
No. Banks	277	411	384	413	402	384	2169	109
Hausman test FE vs. HT	10.33	9.84	13.13	14.13	12.52	11.76	24.76	3.87
p-value	0.378	0.776	0.593	0.516	0.639	0.697	0.06	0.998

This table reports subsamples Hausman-Taylor estimations based on level of bank capital stringency, market funding, and bank capitalization, without U.S. We categorize a country into high capital stringency regulation subsample if its capital stringency index (CapString) is higher than the sample median. We consider a bank with a high level of market funding if its long term funding to total funding ratio (MarketFund/TF) is higher than the country median. We consider a bank with a high level of capitalization when its equity to total assets ratio (Equity/TA) is higher than the country median. We consider a bank with a low total regulatory capital ratio (TCR) when its TCR is lower than the country regulatory threshold plus two percent. Variable definitions: Dependent variables: DP = cash dividend related to the period/earnings; ShareholderRights = Revised anti director index (Djankov at al. 2008); CreditorRights = Creditor Rights Index (Djankov et al. 2007); t-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***.*

Table A10 Panel B. Bank dividend policy, shareholder and creditor rights, and further additionnal factors over the period 2001-2014, without Japan.

Dependent: *DP*	Capital stringency		Market funding		Capitalization		TCR	
	High	Low	High	Low	High	Low	High	Low
ShareholderRights	-6.73***	-1.95	-2.33*	-2.55*	-3.30**	-2.41*	-3.57***	-2.26
	(-3.92)	(-1.27)	(-1.68)	(-1.86)	(-2.29)	(-.1.76)	(-3.18)	(-1.10)
CreditorRights	1.99	3.39**	-0.10	4.85***	3.96***	0.67	3.41***	3.76
	(1.18)	(2.26)	(-0.06)	(3.36)	(2.62)	(0.46)	(2.81)	(1.16)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. Obs.	4763	1888	3166	3535	3326	3325	6254	296
No. Banks	872	608	734	768	796	756	1042	149
Hausman test FE vs. HT	6.38	13.73	6.14	19.23	21.93	3.81	22.3	4.12
p-value	0.956	0.271	9.77	0.203	0.101	0.998	0.1	0.997

This table reports subsamples Hausman-Taylor estimations based on level of bank capital stringency, market funding, and bank capitalization, without Japan. We categorize a country into high capital stringency regulation subsample if its capital stringency index (CapString) is higher than the sample median. We consider a bank with a high level of market funding if its long term funding to total funding ratio (MarketFund/TF) is higher than the country median. We consider a bank with a high level of capitalization when its equity to total assets ratio (Equity/TA) is higher than the country median. We consider a bank with a low total regulatory capital ratio (TCR) when its TCR is lower than the country regulatory threshold plus two percent. Variable definitions: Dependent variables: DP = cash dividend related to the period/earnings; ShareholderRights = Revised anti director index (Djankov at al. 2008); CreditorRights = Creditor Rights Index (Djankov et al. 2007); t-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***.*

Table A11 Panel C. Bank dividend policy, shareholder and creditor rights, and further additional factors over the period 2001-2014, without Russian Federation.

Dependent: *DP*	Capital stringency		Market funding		Capitalization		TCR	
	High	Low	High	Low	High	Low	High	Low
ShareholderRights	-6.64***	-0.30	-3.68***	-3.49***	-4.20***	-3.74**	-2.77**	-1.62
	(-3.84)	(-0.28)	(-2.45)	(-2.87)	(-3.18)	(-2.40)	(-2.40)	(-0.76)
CreditorRights	2.03	2.49**	-0.18	3.54***	3.06**	-0.73	2.71**	3.69
	(1.19)	(2.25)	(-0.11)	(2.70)	(2.18)	(-0.43)	(2.27)	(1.10)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. Obs.	4719	2328	3275	3772	3551	3496	5983	278
No. Banks	857	638	376	804	815	775	987	141
Hausman test FE vs. HT	5.8	7.05	5.88	5.05	10.24	5.89	13.53	4.71
p-value	0.971	0.936	0.981	0.991	0.804	0.981	0.566	0.994

This table reports subsamples Hausman-Taylor estimations based on level of bank capital stringency, market funding, and bank capitalization, without Russian Federation. We categorize a country into high capital stringency regulation subsample if its capital stringency index (CapString) is higher than the sample median. We consider a bank with a high level of market funding if its long term funding to total funding ratio (MarketFund/TF) is higher than the country median. We consider a bank with a high level of capitalization when its equity to total assets ratio (Equity/TA) is higher than the country median. We consider a bank with a low total regulatory capital ratio (TCR) when its TCR is lower than the country regulatory threshold plus two percent. Variable definitions: Dependent variables: DP = cash dividend related to the period/earnings; ShareholderRights = Revised anti director index (Djankov at al. 2008); CreditorRights = Creditor Rights Index (Djankov et al. 2007); t-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***.*

Table A12 Panel A. Bank dividend policy, shareholder and creditor rights, and further additional factors over the period 2001-2014, without U.S.

Dependent: *DP*	Competition		Capital Depth		Disclosure	
	High	Low	High	Low	High	Low
ShareholderRights	-4.48***	-4.17***	-9.23**	-5.72***	-12.19**	-4.86*
	(-2.94)	(-3.73)	(-2.23)	(-3.75)	(-2.55)	(-1.94)
CreditorRights	3.53**	-0.16	4.57*	-1.12	7.53***	-2.52
	(2.53)	(-0.12)	(1.81)	(-0.53)	(3.03)	(-0.99)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
No. Obs.	1507	1701	1394	1814	1663	966
No. Banks	430	410	210	327	237	186
Hausman test FE vs. HT	9.94	19.33	5.53	18.18	10.06	12.38
p-value	0.823	0.199	0.986	0.254	0.852	0.65

This table reports subsamples Hausman-Taylor estimations based on level of competition, capital depth, and disclosure requirement, without U.S. We categorize a country into high competition subsample if its country level Lerner index is lower than the sample median. We consider a country into high capital depth if its ratio of market capitalization to GDP (CapDepth) is higher than the sample median. We consider a country into high disclosure requirement of its disclosure requirement index (Disclosure) is higher than the sample median. Variable definitions: DP = cash dividend related to the period/earnings; ShareholderRights = Revised anti director index (Djankov at al. 2008); CreditorRights = Creditor Rights Index (Djankov et al. 2007); t-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***.*

Table A13 Panel B. Bank dividend policy, shareholder and creditor rights, and further additional factors over the period 2001-2014, without Japan.

Dependent: *DP*	Competition		Capital Depth		Disclosure	
	High	Low	High	Low	High	Low
ShareholderRights	-4.29***	-2.11*	-8.35***	-5.72***	-9.93**	-4.86*
	(-3.07)	(-1.84)	(-2.24)	(-3.75)	(-2.19)	(-1.94)
CreditorRights	3.67***	1.37	3.78*	-1.12	5.70**	-2.52
	(2.68)	(1.03)	(1.69)	(-0.53)	(2.14)	(-0.99)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
No. Obs.	2965	3683	4837	1814	5106	966
No. Banks	836	921	737	327	764	186
Hausman test FE vs. HT	10.15	19.01	2.88	18.18	3.1	12.38
p-value	0.81	0.213	0.998	0.254	0.995	0.65

This table reports subsamples Hausman-Taylor estimations based on level of competition, capital depth, and disclosure requirement, without Japan. We categorize a country into high competition subsample if its country level Lerner index is lower than the sample median. We consider a country into high capital depth if its ratio of market capitalization to GDP (CapDepth) is higher than the sample median. We consider a country into high disclosure requirement of its disclosure requirement index (Disclosure) is higher than the sample median. Variable definitions: DP = cash dividend related to the period/earnings; ShareholderRights = Revised anti director index (Djankov at al. 2008); CreditorRights = Creditor Rights Index (Djankov et al. 2007); t-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***.*

Table A14 Panel C. Bank dividend policy, shareholder and creditor rights, and further additional factors over the period 2001-2014, without Russian Federation.

Dependent: *DP*	Competition		Capital Depth		Disclosure	
	High	Low	High	Low	High	Low
ShareholderRights	-4.29***	-2.11*	-11.29***	-4.59***	-14.53***	-4.86*
	(-3.07)	(-1.84)	(-3.68)	(-3.41)	(-4.38)	(-1.94)
CreditorRights	3.67***	1.37	4.80**	-3.01	7.84***	-2.52
	(2.68)	(1.03)	(2.14)	(-1.50)	(3.20)	(-0.99)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
No. Obs.	2965	3683	5552	1525	5791	966
No. Banks	836	921	821	272	848	186
Hausman test FE vs. HT	10.15	19.01	2.95	11.18	3.28	12.38
p-value	0.81	0.213	0.99	0.739	0.99	0.65

This table reports subsamples Hausman-Taylor estimations based on level of competition, capital depth, and disclosure requirement, without Russian Federation. We categorize a country into high competition subsample if its country level Lerner index is lower than the sample median. We consider a country into high capital depth if its ratio of market capitalization to GDP (CapDepth) is higher than the sample median. We consider a country into high disclosure requirement of its disclosure requirement index (Disclosure) is higher than the sample median. Variable definitions: DP = cash dividend related to the period/earnings; ShareholderRights = Revised anti director index (Djankov at al. 2008); CreditorRights = Creditor Rights Index (Djankov et al. 2007); t-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***.*

Appendix B

We follow Love and Peria (2015) to estimate the Lerner index. We first estimate the marginal cost by using translog cost function; we then compute the Lerner Index as the difference between price and marginal costs relative to the price:

$$lnTC_{i,t} = \alpha_0 + \alpha_1 lnTA_{i,t} + \frac{1}{2}\alpha_2 (lnTA)^2_{i;t} + \sum_{j=1}^{3} \beta_j \, lnw_{j\,i,t} + \sum_{j=1}^{3}\sum_{k=1}^{3} \beta_{jk} \, ln\, w_{j\,i,t} lnw_{k\,i,t}$$

$$+ \sum_{j=1}^{3} \gamma_j \, lnTA_{i,t} lnw_{j\,i,t} + \gamma_t + \varepsilon_{i,t} \qquad (i)$$

$$MC_{i,t} = \frac{TC_{i,t}}{TA_{i,t}} \left(\alpha_1 + \alpha_2 lnTA_{i,t} + \sum_{j=1}^{3} \gamma_j lnw_{j\,i,t} \right) \qquad (ii)$$

$$Lerner_{i,t} = \frac{Price_{i,t} - MC_{i,t}}{Price_{i,t}} \qquad (iii)$$

Where subscript i and t denote bank i and time t; *lnTC* is the logarithm of total cost; *lnTA* is the logarithm of total assets; *lnw* is the logarithm of input cost, where inputs are w_1 the ratio of interest expenses to total deposits, w_2 the ratio of personnel expenses to total assets, and w_3 the ratio of other operating and administrative expenses to total assets. *MC* is the marginal cost, and Price is *Revenues*. The equation (i) is estimated for each country using fixed effects, then we compute the countries' Lerner for each year (year t) by averaging the Lerner indices of banks from equation (iii) for the year t.

Chapter 2: Do Asymmetric Information and Ownership Structure Matter for Dividend Payout Decisions? Evidence from European Banks[19]

[19] This chapter was co-written with Laetitia Lepetit and Céline Meslier.

1. Introduction

Dividend policy has been an area of intense research in corporate finance, with theoretical and empirical analysis showing that firms follow well considered payout strategies (Lintner 1956; Fama & French 2001; Banerjee *et al.* 2007). Within this literature, the role of dividend policy dealing with asymmetric information and agency conflicts between corporate insiders and outsiders has received a great deal of attention. The payment of dividends decreases the level of funds available for perquisite consumption and investment opportunities and requires insiders to seek financing in capital markets. Dividend payouts can therefore be used as a control mechanism by outside shareholders to prevent entrenchment or empire-building (Jensen & Meckling 1976; Easterbrook 1984; Zwiebel 1996).

While there is an extensive literature analyzing whether dividend policy is used as a corporate mechanism to reduce agency conflict in the case of non-financial firms, few empirical papers analyze this issue for financial firms, despite its regulatory relevance. This issue is of particular interest because the distribution of earnings as dividends obviously reduces banks' ability to generate capital internally, and then transfers default risk to their creditors and deposit insurer (Acharya *et al.* 2009; Acharya *et al.* 2013). Moreover, banks distributed large scale dividend payouts during the 2007-2008 financial crisis despite widely unanticipated losses, shedding light on the severe malfunctioning of banks corporate governance mechanisms. In this context, the objective of this paper is to empirically examine whether dividend payments are used by banks' insiders as a corporate mechanism, allowing for different agency conflicts and different levels of asymmetric information.

As pointed out in La Porta *et al.* (1998), the level of ownership concentration is a key determinant of the nature of agency conflicts between the different firm stakeholders. In the U.S., the United-Kingdom, Canada and Australia where the ownership is dispersed, the main corporate governance problem is the misalignment of shareholders' and managers' interests. When the ownership is concentrated, as is prevalent in continental Europe and Asia, the conflict of interest shifts away from manager vs. shareholders to majority vs. minority shareholders, as large shareholders have incentives to maximize their own benefits at the cost of other shareholders (Shleifer & Vishny 1997). In both cases, dividend payouts can be used to create shareholder value by reducing free cash flow that can be spent by insiders (managers or majority

shareholders) on value-decreasing projects (Lang & Litzenberger 1989; Chae *et al.* 2009). Higher dividend payouts can then signal that insiders will refrain from expropriation (signaling behavior). Such signaling behavior can be of importance as the potential expropriation of outside investors can be costly to insiders in terms of higher equity financing costs (Chen *et al.* 2009; Chu *et al.* 2014) and lower firm valuation and returns (Claessens *et al.* 2002; Lemmon & Lins 2003; Lins 2003). On the other hand, insiders might have incentives to only pay small dividends in order to increase the amount of free cash flow they can divert for their private consumption (entrenchment behavior[20]) (Jensen 1986; Gomes 2000). The intensity of the agency conflict between insiders and outsiders may be stronger in the presence of concentrated ownership (Sáez & Riaño 2013; Sáez & Gutiérrez 2015). Indeed, in dispersed ownership, different corporate governance mechanisms can be put into place to give top managers strong incentives to discourage entrenchment behaviors, such as, compensation mechanism, dismissal threats or the threat of a hostile takeover. These different corporate mechanisms aiming to rein in managers' behavior are much less relevant when the ownership structure is concentrated, as large investors can elect their representative(s) to the board of directors who will appoint a manager that will act in the interest of these controlling shareholders.

The empirical literature analysing the effectiveness of dividend policy to reduce agency conflicts when there is dispersed ownership structure provides mixed results. Some studies on non-financial firms find that dividends are used by managers to communicate information to shareholders when there is a conflict of interest (Healy & Palepu 1988; Denis *et al.* 1994; Yoon & Starks 1995), whereas other studies do not observe evidence that dividends are used as a signaling device (Benartzi *et al.* 1997; Li & Zhao 2008). Empirical studies dedicated to the banking industry, mostly on U.S. bank holding companies, find evidence that dividends are used as a signaling mechanism (Filbeck & Mullienaux 1993; Bessler & Nohel 1996; Filbeck & Mullienaux 1999; Dickens *et al.* 2002; Theis & Dutta 2009; Abreu & Gulamhussen 2013; Floyd *et al.* 2015). In contrast, Onali *et al.* (2015) find, for a sample a European listed banks, a negative relationship between CEO power and dividend payments, indicating that entrenched CEOs do not

[20] Entrenchment happens when managers (insiders) fail to experience discipline from governance and control mechanisms, and entrenched manager (insiders) have discretions to decide firm's policies (e.g. dividend policy) for their own benefit (Berger *et al.* 1997).

have incentives to increase payout ratios to discourage monitoring from minority shareholders.

Even if the intensity of the agency conflict may be stronger when insiders are controlling shareholders (instead of managers), the empirical literature analyzing the impact of a concentrated ownership on dividend policy is scarcer and provides mixed results. Berzins *et al.* (2012) and De Cesari (2012) find that higher dividends are paid in non-financial firms when the agency conflict between large and small owners is stronger, consistent with signaling behavior. However, Faccio *et al.* (2001) and Gugler and Yurtoglu (2003) find that dividends are higher in non-financial firms with the presence of multiple large shareholders; the other large shareholders impede the controlling shareholder's expropriation of minority shareholders. La Porta *et al.* (2000) further find that this happens only to firms located in countries with better protection of minority shareholders, as asset diversion is legally riskier and more expensive in such countries, thereby raising the relative incentives of large shareholders to grant dividends to minority shareholders.

Despite the importance of the degree of asymmetric information faced by outsiders to explain the intensity of the agency conflict with either managers or majority shareholders, only few studies examine the relationship between the level of asymmetric information and dividend policy. The empirical results on the effects of asymmetric information on dividends are mixed, focusing only on listed non-financial firms which have generally a dispersed ownership structure. While Li and Zhao (2008) and Leary and Michaely (2011) find that U.S. firms with higher levels of asymmetric information distribute lower dividends, Von Eije and Megginson (2008) find in contrast that European firms with higher asymmetric information pay higher dividends. Brockman and Unlu (2011) further find a U-shaped relationship between dividend payments and disclosure quality.

Our paper complement the existing literature by exploring further the linkages between asymmetry of information, corporate governance and dividend payout decisions for the banking industry. We examine if agency conflicts between stakeholders influence banks' dividend policy differently depending on the level of asymmetric information faced by stakeholders and the ownership structure (dispersed vs. concentrated). We use for that a panel of listed and non-listed European commercial banks over the 2004-2012 period, with heterogeneity in term of agency conflicts. While the influence of asymmetric information on dividend payouts is of particular importance for banks as

their financial structure combined with high leverage makes them inherently more opaque than other firms (Morgan 2002), this aspect has not been explicitly taken into account in existing studies. Whether the dividend policy can help to alleviate agency problems between insiders and outsiders is not a clear cut issue when outsiders are confronted with a high level of asymmetric information. One could argue that in the presence of high opacity, it might be much easier for insiders, both managers and majority shareholders, to extract private benefits of their control. In the presence of such entrenchment behavior, we could then expect a stronger contraction of dividends as the level of opacity increases. However, if insiders want to signal to outsiders that they will not be expropriated, we expect banks to distribute higher dividends with dividends increasing with the level of opacity faced by investors. We test if these two alternative hypotheses of entrenchment or signaling behavior depend on who is involved in managerial decisions, i.e. managers in a dispersed ownership structure and majority shareholders in a more concentrated ownership. We further examine if the institutional and regulatory environment, more specifically the level of shareholder protection and supervisory actions, can constrain any opportunistic entrenchment behavior. Our period of investigation also allows us to determine whether banks' payout behavior is different in normal times and during the financial crisis period.

We find that European banks with either a concentrated or a dispersed ownership structure pay lower dividends when they present high degrees of opacity. These results would be consistent with the entrenchment behavior for banks, with insiders (either managers or majority shareholders) paying lower dividends to extract higher levels of private benefits when outsiders face higher degrees of asymmetric information as it might be more difficult to detect such opportunistic behavior. We find that this entrenchment behavior is observed before and during the crisis period; higher levels of shareholder protection help to constrain it but only when insiders are majority shareholders, whereas stronger supervisory regimes contribute to moderate the entrenchment behavior of both managers and majority shareholders.

Our paper makes several contributions to the existing literature. We contribute to the literature exploring the determinants of dividend policy by analyzing if the levels of asymmetric information combined with different ownership structures influence the dividend payout policy. We also add to the literature investigating the dividend payout decisions of banks. Few empirical papers analyze the determinants of dividend policy of banks, while the Federal Reserve Board (FRB 2011) and the Basel Committee on

Banking Supervision (BCBS 2011) have been emphasizing the necessity to increase oversight of banks' dividend payouts. Indeed, as pointed out by Abreu and Gulamhussen (2013), while imposing constraints on bank dividend payments may reduce equity-debt agency conflicts and avoid wealth transfer from debt to equity-holders, it may also reduce the ability of banks to signal their future growth perspectives to investors. We also highlight that such constraints on dividend payments might facilitate insiders' entrenchment behavior when stakeholders face high levels of asymmetric information. By analyzing the relationship between the degree of opacity and dividend payouts for different levels of ownership concentration, using detailed bank level data especially on their ownership structure, and examining a wider dataset containing both listed and unlisted banks, we further aim to obtain a better understanding of the underlying mechanisms at work. For this we focus on a European dataset which provides a substantial amount of variability between individual levels of ownership concentration given the lack of regulatory limitations on the percentage of bank capital owned by a single entity in Europe.

Section 2 describes our sample, the ownership characterization and the measures of opacity used. Section 3 presents our methodology. Section 4 discusses our main results. Section 5 tests the robustness of those results and Section 6 concludes the paper.

2. Data and variable construction

2.1. Sample

Our sample covers listed and non-listed commercial banks from 15 European countries (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the United Kingdom). Our data set covers the period 2004–2012. We extracted bank financial statement data from BvD Bankscope. We consider consolidated data but also use unconsolidated data when consolidated balance sheets are not available. All the banks in our sample publish their annual financial statements at the end of the calendar year. As for the ownership structure of banks, we compute time-varying variables by combining data from several sources, i.e. BvD Bankscope, Thomson Reuters Advanced Analytics and hand-collected annual reports, in order to obtain information as complete as possible.

BvD Bankscope provides financial statement data for 1,062 active European commercial banks for at least some of the period considered. We limit our sample to

European commercial banks which provide information on our variables of interest and we clean the data by dropping the lowest and highest 1% observations. We further apply specific cleaning criteria for the variable measuring the dividend payout ratio, defined as total dividends paid related to the period divided by net income.[21] We check if there are banks that have non-positive earnings but still pay dividends. We find 96 observations for which banks have negative earnings, with 42 among them that pay dividends.[22] We also have 16 observations for which banks have zero earnings, with 4 that still pay dividends. We drop the 46 observations in our data cleaning corresponding to banks with non-positive earnings which pay dividends, to avoid negative dividends and infinite numbers.

We end up with a final sample of 1,150 annual observations corresponding to 330 European commercial banks (see Table 1 for a breakdown by country). Table 2 presents some general descriptive statistics for our sample of commercial banks. The median data coverage of our sample, as measured in percent of total assets in the wider BvD Bankscope one, lies at almost 54%.

[21] We do not include preferred dividends because we argue that unlike common dividends, payouts for preferred stocks are hardly similar to common dividend payout decisions where the payout is fixed. Thus, the controlling shareholder cannot influence the decision of preferred dividend payments. The only decision that could be influenced is whether to issue preferred stocks or not in the first place. Consequently, for example, assuming that most of preferred stocks are cumulative, the controlling shareholder may be able to expropriate the other shareholders by not paying dividends, but they cannot do it to preferred shareholders. There are only 21 observations in our sample that have share repurchase. Including share repurchase do not change our results.

[22] We have 21 banks that paid dividends while having negative earnings during the financial crisis of 2007-2008 (among them Royal Bank of Scotland, Lloyds Bank and Credit Agricole), while only 3 banks paid dividends with negative earnings before 2007.

Table 1. Distribution of banks by country

Country	Our sample of commercial banks	Full sample of commercial banks in Bankscope	Percent of total assets
Austria	12	80	56.18
Belgium	7	38	36.11
Denmark	34	58	53.31
Finland	4	10	72.52
France	53	147	45.45
Germany	21	151	60.94
Greece	9	20	61.65
Ireland	5	18	44.06
Italy	58	142	54.63
Luxembourg	36	88	26.79
Netherlands	12	40	44.45
Portugal	7	27	41.32
Spain	18	69	81.54
Sweden	11	26	72.25
U.K.	43	148	50.31
Total	330	1062	Median = 53.31

Percent of total assets represents the average of total assets of commercial banks in our sample for the year 2004-2012 divided by the average of total assets of commercial banks of the full sample of banks provided by BvD Bankscope for the year 2004-2012.

Table 2. General descriptive statistics, on average over the period 2004-2012

	Deposit	*ETA*	*Loan*	*LLP*	*ROA*	*ROE*	*NII*	*Expenses*	*TA*	*DP*
All banks (330 banks, 1,150 observations)										
Mean	53.90	7.02	56.35	0.28	0.86	12.99	40.05	58.10	143,122	46.08
Std. Dev.	20.05	3.68	23.60	0.43	0.81	9.40	15.95	13.15	404,462	29.71
Minimum	10.46	0.42	0.40	-6.06	-7.00	-59.04	-26.67	10.00	50	0
Maximum	91.97	21.30	94.13	4.14	9.26	77.91	87.50	87.37	3,424,403	100
Cluster 1 Dispersed ownership (89 banks, 294 observations)										
Mean	51.20	7.20	61.96	0.31	0.85	12.34	38.22	58.32	306,390	32.32
Std. Dev.	18.54	3.84	17.24	0.43	0.77	6.91	13.10	10.78	650,455	22.48
Cluster 2 Concentrated ownership (119 banks, 307 observations)										
Mean	51.85	7.83	60.13	0.36	0.80	10.96	37.62	58.91	86,902	46.29
Std. Dev.	18.35	3.84	24.04	0.37	0.70	8.94	14.36	13.28	288,810	28.71
Cluster 3 Highly concentrated ownership (187 banks, 549 observations)										
Mean	56.42	6.47	51.15	0.22	0.90	14.50	42.62	57.58	87,429	53.88
Std. Dev.	21.50	3.39	25.20	0.46	0.88	10.53	17.72	14.20	227,734	30.95

Variable definitions (all variables are expressed in percentages, except TA which is in millions of USD): Deposit = deposits/total assets; ETA = total equity/total assets; Loan = net loans/total assets; LLP = loan loss provisions/total assets; ROA = net income/total assets; ROE = net income/total equity; NII = non-interest income/operating profit; Expenses = operating expenses/operating profit; TA = total assets; DP = cash dividend related to the period/earnings.

Clusters 1-3 are determined using a hierarchical agglomerative clustering (HAC) approach that uses three ownership measures in the construction of clusters of banks with "similar" ownership characteristics: the percentage held by the largest shareholder, the percentage held by the second-largest shareholder, and a Herfindahl index computed for a bank's ownership distribution.

2.2. Ownership measures

To classify banks according to the level of concentration of their ownership structure, we follow Bouvatier *et al.* (2014) and use a hierarchical agglomerative clustering (HAC) approach to account more accurately for several dimensions of banks' ownership characteristics. Three ownership measures are considered to identify banks which have similar characteristics in the construction of different clusters: the percentage of shares held by the largest shareholder ($Share1_{ij,t}$), the percentage of shares held by the second-largest shareholder ($Share2_{ij,t}$),[23] and the Herfindahl-Hirschman index ($Concentration_{ij}$).[24] The first two measures give information on the presence of one or two large shareholders, and the Herfindahl index captures the concentration of the ownership. The HAC uses Euclidean distance to compute similarity between two banks. The Ward method is used to determine the distance between clusters consisting of several banks (see Appendix A in Bouvatier *et al.* (2014) for more details). We obtain three distinct bank clusters, labelled Cluster 1, 2 and 3. Banks can change cluster over time if their ownership structure changes accordingly. 89 banks belong to Cluster 1, 119 banks to Cluster 2 and 187 to Cluster 3 at some point in time amongst the 330 banks in our sample, with 65 banks that change between clusters during the sample period. General descriptive statistics for banks in these clusters are provided in Table 2, and Table 3 provides statistics for the ownership measures for each of the three clusters.

With the largest and the second largest shareholder holding on average respectively 15.39% and 10.32% of the shares, banks in Cluster 1 (dispersed ownership) are characterized by a dispersed ownership structure with a large number of shareholders that do not hold controlling shares (see Table 3). We assume that the conflict of interest between managers and shareholders is highest in this cluster as there is a separation between ownership and control. Banks in Cluster 2 (concentrated ownership) have a concentrated ownership structure with either one shareholder or two shareholders that hold a controlling stake (for a control threshold of 50%), and some smaller

[23] We alternatively use the ratio of the shares held by the second largest shareholder to those held by the largest shareholder ($Share2_{ij,t}/Share1_{ij,t}$) instead of $Share2_{ij,t}$ to construct our clusters. This ratio measures the relative power of the second largest shareholder compared to the largest shareholder, with the highest value implying comparable size between the controlling stakes of the two largest shareholders. The classification of banks are very similar when we use either ($Share2_{ij,t}/Share1_{ij,t}$) or $Share2_{ij,t}$.

[24] We compute for each bank i the variable OS_i, defined by the ratio of the percentage of equity held by each shareholder n to the total percentage of equity held by all shareholders; we then compute *Concentration* as $\sum_{n=1}^{N} OS_n^2$ with N the total number of shareholders. The higher the Herfindahl index, the higher the concentration of bank ownership.

shareholders. Banks in Cluster 3 (highly concentrated ownership) display a very strong level of ownership concentration. The controlling shareholder holds on average around 98.5% of the shares, with other shareholders holding a corresponding small percentage. Hence, in Clusters 2 and 3, the conflict of interest is between majority and minority owners.

We build on this classification to construct our ownership structure variables. We compute the dummy variables $Ck_{i,t}$ that takes the value of one if the bank *i* is in Cluster *k* for the year *t* and zero otherwise, with *k*=1,2,3.

Table 3. Descriptive statistics on ownership measures by cluster, on average over the period 2004–2012.

	Share1	*Share2*	*Share2/Share1*	*Dispersion*
All banks (1,150 observations)				
Mean	68.12	8.53	0.26	0.61
Std. Dev.	35.24	11.83	0.34	0.39
Minimum	0.01	0	0	0.00
Maximum	100	50.00	1.00	1.00
Cluster 1 Dispersed ownership (294 observations)				
Mean	15.39	10.32	0.65	0.06
Std. Dev.	12.85	9.04	0.3	0.08
Minimum	0.01	0.01	0.006	0
Maximum	42.18	41.00	1.00	0.34
Cluster 2 Concentrated ownership (307 observations)				
Mean	62.69	20.18	0.34	0.46
Std. Dev.	12.31	13.53	0.26	0.15
Minimum	43.37	0.01	0.0002	0.20
Maximum	85.83	50.00	1.00	0.75
Cluster 3 Highly concentrated ownership (549 observations)				
Mean	98.70	0.59	0.006	0.97
Std. Dev.	2.64	1.79	0.019	0.05
Minimum	86.67	0	0	0.75
Maximum	100	10.00	0.11	1.00

Variable definitions: Share1 = percentage held by largest shareholder; Share2 = percentage held by second-largest shareholder; Share2/Share1 = relative (voting) power of the second largest shareholder compared to the largest shareholder; Dispersion = Herfindahl index on bank's ownership distribution (we compute for each bank i the variable OS_i, defined by the ratio of the percentage of equity held by each shareholder n to the total percentage of equity held by all shareholders; we then compute Concentration as $\sum_{n=1}^{N} OS_n^2$ with N the total number of shareholders).
Clusters 1-3 are determined using a hierarchical agglomerative clustering (HAC) approach that uses three ownership measures (Share1, Share2 and Concentration) in the construction of clusters of banks with "similar" ownership characteristics

2.3. Opacity measures

We define opacity as information asymmetry between more or less informed stakeholders. We build on the existing literature to compute a composite index based on proxies that capture four components of opacity.

Our first information asymmetry component ($EF_{ij,t}$) measures the disconnection between insiders' and outsiders' information about firms' financial condition. A firm's information opacity is expected to affect the properties of financial analysts' forecasts, with higher analyst earnings forecast error and dispersion in analyst forecasts (Krishnaswami & Subramaniam 1999; Diether *et al.* 2002). We build an earnings prediction model based on publicly available information and use the residual of the regression as a measure of insiders' private information, following Park (1999) and Crouzille *et al.* (2004) (see Appendix B for more details). The higher the forecast error $EF_{ij,t}$, the higher is the opacity.

Our second information asymmetry component ($EM_{ij,t}$) is related to the opacity of financial statements. A decrease in the quality of financial statements is likely to widen the asymmetric information about firm financial position between insiders and outsiders. Since Dechow and Dichev (2002), the accepted view is that insiders' discretion influences accrual quality and reduces the information that outside investors can collect from financial statements. Moreover, insiders can hide their self-serving behaviors through earnings management (Leuz *et al.* 2003; Cornett *et al.* 2009; Bouvatier *et al.* 2014). Accounting numbers no longer reflect the economic reality of underlying risk conditions in this case and it is difficult for outsiders to accurately assess the fundamental value of the bank. We follow Hutton *et al.* (2009) and Lang and Maffett (2011) and use the degree of earnings management as a measure of accounting opacity. Previous studies regarding earnings management at banks measure it via loan loss provisions because these are relatively large accruals and therefore have a significant impact on banks' earnings (Ahmed *et al.* 1999).[25] We use a similar approach to Bouvatier and Lepetit (2008) to measure the discretionary element of loan loss provisions that are used for earnings management (see Appendix B for more details). The higher the earnings management $EM_{ij,t}$, the higher is the opacity.

[25] Earnings management could also be measured by discretionary realizations of security gain or losses(Cornett *et al.* 2009). However, the net gain on securities only represents around 4% of the total operating income in our sample for European commercial banks, leaving little scope for earnings management.

Our third information asymmetry component is the negative of the ratio of short term and long term market funding to total assets ($MF_{ij,t}$), which shows the degree of banks' exposure to the market. When banks have greater exposure to the market, there will be more market participants to assess the fair value of the bank, thus reducing asymmetric information. The proportion of market funding on the liability side of the balance-sheet is considered as a signal for outsiders of lower opacity (Crouzille *et al.* 2004). The higher $MF_{ij,t}$ (lower market funding), the higher is the opacity.

Our last information asymmetry component is the proportion of loans in total assets ($Loan_{ij,t}$). Theoretical analyses all lead to the same conclusion that bank loans are opaque (Campbell & Kracaw 1980; Berlin & Loeys 1988; Diamond 1991). These theories show that bank loans are unusually difficult for outside investors to value as insiders have privileged information about the characteristics of the loan contracts and the creditworthiness of the borrowers.[26] The higher the loan proportion, the higher is the opacity.

We use the four variables $EF_{ij,t}$, $EM_{ij,t}$, $MF_{ij,t}$, and $Loan_{ij,t}$ to construct our opacity composite index ($Opacity_{ij,t}$). We check that the four components of our composite index capture different dimensions of information asymmetry. The low correlations among the variables $EF_{ij,t}$, $EM_{ij,t}$, $MF_{ij,t}$ and $Loan_{ij,t}$ show that this is the case (see Table A1 in Appendix A). We associate the four components $EF_{ij,t}$, $EM_{ij,t}$, $MF_{ij,t}$ and $Loan_{ij,t}$, with the value of one for the first decile, the value of two for the second decile and so on. We then sum these four proxies and we divide it by four to scale our composite index $Opacity_{ij,t}$. It ranges in principle from one to ten, with the highest value representing the highest level of opacity that outsiders can face. This index provides a robust measure of opacity because it averages across several measures of asymmetric information.[27] For our sample of European commercial banks, the index has a mean of

[26] Trading assets also represent an important source of opacity for banks (Morgan 2002). However, in our sample, trading assets are concentrated primarily at the largest banks. On average, less than 1.14 percent of assets are held as trading assets, whereas loans represent on average around 56 percent of the total assets and are therefore the primary assets for most banks.

[27] We tried to use a hierarchical agglomerative clustering approach to classify banks according to their degree of opacity, based on the four variables $EF_{ij,t}$, $EM_{ij,t}$, $MF_{ij,t}$, and $Loan_{ij,t.}$ But we were not able to classify banks in a limited number of groups as they can have a low/high value for one component, but not for the other ones, and so on. The low correlation between these four components actually shows that each variable captures a specific aspect of opacity. It is then better to use a composite index that takes into account all dimensions of opacity.

5.62 and ranges from 2.25 to 9.25 (see Table 4). The opacity composite index is significantly higher in Cluster 2 compared to Cluster 3, but not compared to Cluster 1.[28] We compute the dummy variable *High Opacity*$_{ij,t}$, that takes the value of one if the index *Opacity*$_{ij,t}$ of a bank is greater than the sample median value and zero otherwise, to differentiate banks which have a relatively high and low degree of opacity.

Table 4. Descriptive statistics of opacity measures, on average over the period 2004-2012.

	Opacity	*EM*	*EF*	*MF*	*Loan*
All banks (1,150 observations)					
Mean	5.62	0.60	0.34	13.80	57.45
Std. Dev.	1.37	0.70	0.45	14.11	22.91
Minimum	2.25	-4.86	0	0	0.40
Maximum	9.25	6.86	6.26	79.61	94.13
Cluster 1 Dispersed ownership (294 observations)					
Mean	5.44	0.58	0.30	18.46	62.13
Std. Dev.	1.34	0.76	0.41	15.46	16.34
Cluster 2 Medium ownership concentration (307 observations)					
Mean	5.80	0.62	0.37	14.55	60.12
Std. Dev.	1.43	0.53	0.57	13.81	23.24
Cluster 3 High ownership concentration (549 observations)					
Mean	5.62	0.59	0.34	10.94	53.36
Std. Dev.	1.33	0.74	0.39	12.87	24.99

Variable definitions: Opacity = composite index of four opacity measures (EF, EM, MF, and Loan as defined in section 2.3); EM=earning Management; EF = earning forecast error; MF= the negative value of (long term + short term market funding)/total assets; Loan = net loans/total assets,
Clusters 1-3 are determined using a hierarchical agglomerative clustering (HAC) approach that uses three ownership measures in the construction of clusters of banks with "similar" ownership characteristics: the percentage held by the largest shareholder, the percentage held by the second-largest shareholder, and a Herfindahl index computed for a bank's ownership distribution.

3. Specifications and hypotheses tested

3.1. Baseline specification

We first investigate whether the decision of insiders to pay dividends depends on the inter-connection between the degree of opacity faced by outsiders and the level of ownership concentration. For that, we estimate the following equation[29]

[28] Mean tests are available on request.

[29] Equation (1) can be equivalently be expressed as follows: $DP_{ij,t} = \sum \gamma_k Ck_{ij,t} + \sum \delta_k Ck_{ij,t} * HighOpacity_{ij,t} + \theta\ HighOpacity_{ij,t} + \sum \beta_k Controls_{ij,t} + \alpha_t + \varepsilon_{ij,t}$ (Equation (1bis)). We can drop the dummy variable HighOpacity, however, as we include the three Cluster dummy variables (and drop the constant) and High Opacity is a dummy variable. Equation (1) facilitates interpretation as the

$$DP_{ij,t} = \sum_{k=1}^{3} \gamma_k Ck_{ij,t} + \sum_{k=1}^{3} \delta_k Ck_{ij,t} * High\ Opacity_{ij,t} + \sum_{k=1}^{10} \beta_k Controls_{ij,t} + \alpha_t + \varepsilon_{ij,t} \quad (1)$$

where *i*, *j*, *t* stand respectively for bank, country and time.

The dividend payout ($DP_{ij,t}$) is defined as total dividends paid related to the period divided by net income. The dividend to earnings ratio is the most commonly used measure of dividend payouts as it captures the key element of the payout policy (La Porta *et al.* 2000; Fidrmuc & Jacob 2010). We include the three cluster dummy variables altogether instead of considering a reference category (we then drop the constant). We also include interaction terms between the Cluster dummy variables $Ck_{ij,t}$ and the dummy variable $High\ Opacity_{ij,t}$. The dividend payouts of banks in Cluster *k* with a low degree of opacity is given by (γ_k), while those of banks with a relatively high degree of opacity is given by ($\gamma_k + \delta_k$).

We test two alternative hypotheses. If insiders signal their unwillingness to extract private benefits when the opacity is relatively high by granting dividends to outsiders (*signaling hypothesis*), we expect δ_k to be significantly positive. If alternatively insiders decide to decrease dividends as it increases the funds at their discretion when the opacity is relatively high (*entrenchment hypothesis*), we expect δ_k to be significantly negative. We further test if, for the same degree of opacity, the dividend payout ratio is increasing or decreasing with the level of ownership concentration. If we follow Sáez and Riaño (2013) and Sáez and Gutiérrez (2015), we would expect that agency conflicts are stronger in concentrated ownership than in dispersed ownership. We would then observe either an increase of dividends between clusters if insiders in a more concentrated ownership want to signal their unwillingness to expropriate outsiders, or on the contrary, a decrease of dividends if they use their controlling power to increase funds they have at their discretion.

We build on the existing literature and include control variables that might have an impact on the dividend policy of firms. Size, profitability and growth opportunities are important determinants of dividend payout ratios of non-financial firms (La Porta *et al.*

coefficient of banks with high levels of opacity in Cluster *k* is ($\gamma_k + \delta_k$) rather than ($\gamma_k + \delta_k + \theta$) in Equation (1bis).

2000; Fama & French 2001; Von Eije & Megginson 2008). We measure bank size ($Size_{ij,t}$) through the natural logarithm of total assets and use the return on asset ($ROA_{ij,t}$) to measure the profitability. We expect large and more profitable banks to pay higher dividends. In order to measure investment opportunities, we use the growth rate of total assets ($Assets\ Growth_{ij,t}$) to measure investment opportunities of banks. Banks with high growth opportunities are expected to plowback their earnings to avoid costly equity and debt financing. We further include the dummy variable $M\&A_{ij,t}$ that identifies banks which were involved in operations of acquisition during our period of analysis, as the dividend policy should be reviewed to reflect the dividend policy of the combined entity and satisfy both acquirer and target firm shareholders.[30] We also control for macroeconomic condition differences across countries by including the GDP growth rate ($GDP\ growth_{j,t}$).

The banking literature suggests that other variables might have an impact on banks' dividend payouts. Onali (2014) finds that banks having higher default risk have higher payout ratios. We use a time-varying Z-score based on 3-year rolling windows to proxy bank default risk.[31] We follow Lepetit and Strobel (2015) and use its natural logarithm in our specifications ($LnZscore_{ij,t}$). Acharya *et al.* (2013) show that the optimal dividend policy also depends on the bank's franchise value. In line with this theoretical finding, Onali (2014) shows that the bank charter value has a negative impact on dividend payouts. Banks with higher charter have an incentive to pay lower dividends in order to preserve the charter. We use the ratio customer deposits to total assets ($Deposit_{ij,t}$) to proxy the charter value based on the banking literature showing that customer deposits contribute to a bank's charter value (James 1991; Goyal 2005). We compute the dummy variable $High\ Charter_{ij,t}$ that takes the value one if the ratio customer deposits to total assets is larger than the sample median, and zero otherwise. We further control for the level of capitalization by introducing the dummy variable $High\ Capitalized_{ij,t}$ that takes the value of one if the previous year's risk-weighted capital ratio is larger than the sample median, and zero otherwise. Banks with lower regulatory capital ratios are expected to have lower dividend payouts than well-capitalized banks, as dividends paid affect the ability of banks to build a solid capital buffer (Rossi and Volpin (2004);

[30] We use the database Thomson Reuters Advanced Analytics to identify mergers and acquisitions involving European commercial banks.

[31] The Zscore is defined as: $(MROA(3)_{ijt} + ETA_{ij,t})/ SDROA(3)_{ij,t}$, where $MROA(3)_{ij,t}$ and $SDROA(3)_{ij,t}$ are the moving average and standard deviation of return on assets (with a window width of 3), and $ETA_{ij,t}$ is the equity to total assets ratio at the date *t*. Higher Z-score means lower probability of default.

Acharya *et al.* 2013; Onali 2014). As our period of analysis includes the financial crisis period of 2007-2008, we also control for banks that were in distress during this period by including the dummy variable $Distress_{ij,t}$ equal to one if a bank was in distress, and zero otherwise. A bank is classified as in "distress" over the period 2008-2012 if it bankrupted, received financial support from the government, or was absorbed by another bank due to financial difficulties.[32] We expect these banks to distribute fewer dividends due to financial constraints.

Finally, we consider an index measuring the level of minority shareholder protection for each country ($Protect_j$). We follow Rossi and Volpin (2004) and Hagendorff *et al.* (2008) and compute an index of shareholder protection that combines an index measuring the level of shareholder rights (revised anti-director index of Djankov *et al.* (2008b)) and an index measuring the quality of law enforcement (the rule of law index from the Worldwide Governance Indicators (World Bank)). The anti-director index measures how strongly the legal system favors minority shareholders against managers or majority shareholders in the corporate decision making process, including the voting process; it ranges from from 0 to 5. The rule of law index reflects perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts; it ranges from -2.5 to 2.5.[33] The index $Protect_j$ is defined as the revised anti-director rights index multiplied by the rule of law index, and ranges from 0.7 to 8.84, with a higher index indicating a higher level of shareholder protection. We compute the dummy variable $High\ Protect_j$ that takes the value of one if the level of shareholder protection for the country *j* is larger than the sample median, and zero otherwise. A positive relationship between $High\ Protect_j$ and dividend payouts is expected if minority shareholders having higher power force insiders to pay more dividends, in line with the outcome model proposed by La Porta *et al.* (2000). On the contrary, a negative relationship will support the substitute model of La Porta *et al.* (2000), where dividends are considered as a substitute for legal protection. It means that dividend payouts should be higher in countries with lower levels of minority shareholder protection than in countries with stronger levels of protection.

[32] We have 19 banks in distress in our sample (out of 65 distress banks identified in the largest sample of BvD Bankscope). Only one of these 19 distress banks distributed dividends when having negative earnings.

[33] We compute the average value of the rule of law index over the period 2004-2012 for each country. It is almost time-invariant for our panel of European countries.

We ensure the absence of multicollinearity problems by computing the correlation matrix (see Table A2 in Appendix A). We test for the presence of endogeneity between dividend payouts and the default risk variable $LnZscore_{ij,t.}$. We use the lags of *LnZscore* and rule of law index as instruments to perform the Durbin-Wu-Hausman test; the results show that $LnZscore_{ij,t}$ is not endogenous.[34] We also test for the presence of endogeneity between dividend payouts and our cluster dummy variables. Indeed, one could argue that investors could have incentives to buy shares of banks which pay higher dividends. We use as instruments the lagged values of the ownership variable. The results show that none of these variables are endogenous. Finally, we also test the potential endogeneity of our opacity index by using the lagged values of the opacity index as instruments, and we find that there is no endogeneity problem.[35]

3.2. Augmented specification

We further analyze whether external factors (*FACT*) might influence the relationship between dividend policy, opacity and ownership structure. More specifically, we examine if the institutional and regulatory environment, through the level of shareholder protection and the strength of the supervisory regime, is effective in shaping insiders' behavior (signaling or entrenchment). For this, we augment Equation (1) with interaction terms between the cluster dummy variables $Ck_{ij,t}$, the dummy variable $High\ Opacity_{ij,t}$ and a dummy variable *FACT* as follows:

$$DP_{ij,t} = \sum_{k=1}^{3} \gamma_k Ck_{ij,t} + \sum_{k=1}^{3} \delta_k Ck_{ij,t} * High\ Opacity_{ij,t} + \sum_{k=1}^{3} \varphi_k Ck_{ij,t} * FACT + \sum_{k=1}^{3} \varsigma_k Ck_{ij,t} * High\ Opacity_{ij,t} * FACT + \sum_{k=1}^{9} \beta_k Controls_{ij,t} + \alpha_t + \varepsilon_{ij,t} \quad (2)$$

We first consider *FACT* as a dummy variable that differentiates countries with high and low levels of shareholder protection, using the dummy variable $High\ Protect_j$ defined above. The payout ratios are given by the parameter (γ_k) for banks with low degrees of opacity in countries with low levels of shareholder protection, by ($\gamma_k + \delta_k$) for banks with high degrees of opacity in countries with low levels of shareholder protection, by ($\gamma_k + \varphi_k$) for banks with low degrees of opacity in countries with high levels of

[34] The test is available from the authors.
[35] Tests are available from the authors.

shareholder protection, and by $(\gamma_k + \delta_k + \varphi_k + \varsigma_k)$ for banks high degrees of opacity in countries with high levels of shareholder protection.

Our aim is to examine whether the level of shareholder protection can influence the way European commercial banks determine their dividend policy in a context of agency conflict and information asymmetry. In line with La Porta *et al.* (2000), Equation (2) first allows us to determine whether European banks' dividend policy is consistent with either the substitution or the outcome hypothesis of dividend payments. According to the first hypothesis, dividend payments are substitute for weak shareholders protection. Paying dividends is a way to establish a reputation of good treatment of shareholders in country with low levels of shareholders protection. With the second hypothesis, dividend payments are considered as an outcome of an effective system of legal protection of shareholder. Secondly, we also test with Equation (2) whether dividend decisions of opaque banks is altered by the level of shareholders protection. On the one hand, if our results with Equation (2) confirms the entrenchment hypothesis, payout ratios of banks with higher degrees of opacity are expected to be lower than the ones of banks with lower degrees of opacity. We then expect that higher levels of shareholder protection can constraint such opportunistic behavior. In this case, payout ratios of banks with higher degrees of opacity located in countries with higher levels of shareholder protection should be lower than those in countries with lower levels of shareholder protection. On the other hand, if our results support the signaling hypothesis, payout ratios of banks with higher degrees of opacity will be higher than those with lower degrees of opacity. In this case, the expected impact of the level of shareholder protection on banks' behavior is not a clear cut issue. One might consider that the level of shareholder protection will not interfere in the relationship between the degree of opacity and payout ratios. However, higher levels of shareholder protection might reduce the need for more opaque banks to use dividends to signal to outsiders that they will not be expropriated.

We alternatively examine whether the strength of supervisory regime has an influence on banks' dividend payouts when outsiders are under asymmetry of information. We use the index of supervisory power computed by Barth *et al.* (2004) to measure propensities of regulatory authorities to do on-site examinations in order to make an overall assessment of banks to determine their economic condition, and their ability to remove and replace managers and directors or to force a bank to change its internal

organizational structure when problems are detected. The index $Supervisory_j$ ranges in principle from 0 to 10, with a higher index indicating stronger supervisory strength. In our sample, the index has a median of 5 and ranges from 4 to 9. We compute the dummy variable $Strong\ Supervisory_j$ that takes the value of one if the index of supervisory regime for the country *j* is larger than the sample median, and zero otherwise. We expect that stronger supervisory regimes limit the entrenchment behavior of insiders. In this case, we should observe no significant differences between payout ratios for banks with high and low degrees of opacity in countries with stronger supervisory regimes, whereas these differences should be significant in countries with weaker supervisory regimes.

4. Results

4.1 Opacity, ownership concentration and dividend policy

The estimation results are given in Table 5. We use panel data regression with random effects to estimate Equation (1) as the variable $High\ Protect_j$ is time invariant (column 1).[36] We also run an Equation (1) without the interaction terms between the Cluster dummy variables $Ck_{ij,t}$ and the dummy variable $High\ Opacity_{ij,t}$ (column 2). We conduct Wald tests to determine whether payout ratios significantly differ across Clusters C1, C2 and C3 depending on the degree of opacity. Results are provided in Table 6 (computed based on estimation results of column 1).

[36] As the variable $High\ Protect_j$ is time invariant, we cannot use a fixed-effects model. Moreover, our ownership variables display little variation over time (small within variation). According to Plumper and Troeger (2007), a fixed-effects model is inefficient in estimating the effect of variables that have such limited within variance. This inefficiency might lead to highly unreliable point estimates and may thus cause wrong inferences. Another argument is provided by Allison (2009, p.3), "*If predictor very greatly across individuals but have little variation over time for each individual, then fixed effects estimates will be very imprecise.*" We therefore decide to use random effects model.

Table 5. Degree of opacity, ownership & dividend policy of European banks for the period 2004-2012.

Dependent: *DP*	(Equation 1)	(Equation 1 without interaction terms)
C1	30.98***	32.90***
	(3.45)	(3.19)
C2	39.05***	39.97***
	(4.46)	(3.89)
C3	40.50***	44.45***
	(4.52)	(4.19)
*C1*High Opacity*	-6.45**	-
	(-2.27)	
*C2*High Opacity*	-8.51***	-
	(-3.08)	
*C3*High Opacity*	-1.51	-
	(-0.55)	
Opacity	-	-6.40**
		(-2.28)
High Protect	-8.34***	-7.97***
	(-3.98)	(-3.80)
ROA	1.88	2.16
	(1.17)	(1.33)
Assets growth	-0.08*	-0.08*
	(-1.72)	(-1.65)
Size	-0.38	-0.11
	(-0.61)	(-0.17)
M & A	-3.43	-3.46
	(-1.26)	(-1.28)
LnZScore	4.12***	4.19***
	(4.10)	(4.15)
High Capitalized	3.96*	4.27*
	(1.78)	(1.90)
High Charter	1.50	2.19
	(0.57)	(0.82)
Distress	-4.71	-4.91
	(-0.80)	(-0.82)
GDP growth	0.74	0.72
	(1.24)	(1.23)
Year Fixed Effects	Yes	Yes
No. Obs.	1150	1150
No. Banks	330	330

Variable definitions: Dependent variable: DP = cash dividend related to the period/earnings. Independent variables: C1-C3 = clusters dummy variables; Opacity = composite index of four opacity measures (EF, EM, MF, and Loan as defined in section 2.3); High Opacity = dummy variable equals one if the opacity composite index of a bank is higher than the sample median; High Protect = dummy variable equals one if the index for degree of minority shareholders protection is higher than the sample median; ROA = Return on Assets; Assets growth = annual growth of total assets; size = log of total assets; M&A = dummy variable equals one the year a bank acquires another financial institutions; LnZScore = log of z score, calculated over 3-year rolling windows; High Capitalized = dummy variables equals one if the bank risk-weighted capital ratio at the beginning of the period is larger than sample median; High Charter = dummy variable equals one if the ratio of customer deposits to total assets is larger than the sample median; Distress=dummy variable takes value of one if banks are distressed; GDP growth = annual GDPgrowth. z-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***. Standard error is adjusted for clustering on bank.*

Table 6. Dividend payout of banks according to the degree of opacity.

	High Opacity	Low Opacity	High - Low Opacity
C1	24.52***	30.98***	-6.45**
	(3.11)	(3.45)	(0.02)
C2	30.54***	39.95***	-8.51***
	(3.56)	(4.46)	(0.00)
C3	38.98***	40.50***	-1.51
	(4.10)	(4.52)	(0.56)

C1-C3 = clusters dummy variables; High Opacity = Banks with high opacity (opacity composite index of a bank is gretaer than the sample median). The coefficient represents the average of dividend payout of banks in each Cluster. It is computed form Equation (1), where the average dividend payout of banks with low and high opacity is given by γ_k *and* $\gamma_k + \delta_k$, *respectively. t-statistics are in parentheses, with p<0.1*, p<0.05** and p<0.01***.*

Results in Table 6 show that the average of the dividend payout ratio is increasing from Cluster 1 to 3 for banks with lower degrees of opacity, while we do not find any significant differences for banks with higher degrees of opacity.[37] It means that dividend payments increase with the level of ownership concentration for banks with lower degree of opacity. This is consistent with majority shareholders trying to signal their unwillingness to expropriate minority shareholders, but only in banks where there is a low level of asymmetric information and where extraction of private benefit might be therefore easier to detect.

We further find that banks in Cluster 1 and Cluster 2 display significantly lower dividends when they have higher degrees of opacity compared to those with lower degrees of opacity. These results are in line with an entrenchment behavior either from managers (Cluster 1) or from majority shareholders (Cluster 2) when there is a high level of asymmetric information. However, we do not find such an entrenchment behavior for banks having a highly concentrated ownership structure (Cluster 3), as we do not observe significant differences in payout ratios for banks with high and low degrees of opacity. This difference of behavior between banks in Cluster 2 and Cluster 3 could be explained by the specific ownership characteristics of the latter. As highlighted in Table 3, majority shareholders of banks in Cluster 3 hold 100% of the shares for half of the observations and more than 98% of the shares for 75% of the observations. When majority shareholders hold such high levels of shares, they would act to maximise shareholders' wealth and not engage in expropriation of minority

[37] Wald tests are available on request.

shareholders who are non-existent (or almost non-existent). Hence, there might be no incentives for an entrenchment behavior for banks in Cluster 3.

Taking all together, these results suggest that the entrenchment behavior we observe is related to higher degree of asymmetric information but not to higher levels of ownership concentration. We find that banks with either a dispersed or a concentrated ownership (but not highly concentrated) pay lower dividends when they display higher levels of information asymmetry compared to those with lower degrees of opacity. Our results therefore support the hypothesis of an entrenchment behavior of insiders when outsiders face high levels of asymmetric information, independently of the nature of the conflict of interest, be it either between managers/shareholders or majority shareholders/minority shareholders.

4.2 Effects of the institutional and regulatory environment

We now examine whether the institutional and regulatory environment, more specifically the level of shareholder protection and the strength of the supervisory regime, could impede the entrenchment behavior observed for banks with higher degrees of opacity.

The estimation results, using random effects estimators, are given in the first two columns of Table 7. Table 8 and 9 report dividends payout ratios and Wald tests for banks with high and low degrees of opacity across clusters, according to the level of shareholder protection (Table 8) and the strength of the supervisory regime (Table 9).

Firstly, we observe from Table 8 (Wald tests in column (a)) that banks belonging to Cluster 2 in countries with lower levels of shareholder protection have lower payout ratios when they have higher degrees of opacity compared to banks with lower degrees of opacity, in line with the entrenchment behavior. However, our results show that such opportunistic behavior does not exist in countries with higher levels of shareholder protection. This result does not hold for banks with a dispersed ownership (Cluster 1) as we find that they pay lower dividends when they are more opaque in countries with higher levels of shareholder protection. Our findings therefore show that higher levels of shareholder protection help to constraint the entrenchment behavior of majority

shareholders but not the one of managers when the level of asymmetric information faced by outsiders is relatively high.

Wald tests in row (b) furthermore show that, for the same degree of opacity, banks dividend payments are higher in countries with lower levels of shareholder protection. This is consistent with the substitute model of La Porta *et al.* (2000), with dividends considered as a substitute for legal protection.

Secondly, we find for countries with weaker supervisory regimes that banks in Cluster 1 and Cluster 2 pay lower dividends when they display higher degrees of information asymmetry compared to those with lower degrees of opacity, in line with the entrenchment behavior (Table 9, column (a)). We do not observe such significant differences between dividend payouts for banks located in countries with stronger supervisory regimes. These results are consistent with the entrenchment behavior of insiders, managers and majority shareholders, being impeded in countries with stronger supervisory regimes. Higher propensities of regulatory authorities to conduct on-site examinations, greater ability of regulator to constrain banks' corporate governance when problems are detected help to mitigate insiders' entrenchment behavior and then reduce minority shareholder expropriation.

Table 7. Degree of opacity, ownership concentration and dividend policy for different levels of shareholder protection and supervisory regime strength, before/during the crisis period, for European commercial banks over the period 2004-2014 (equation 2).

	FACT		
Dependent: *DP*	Protect	Supervisory	Crisis
C1	32.32***	27.72***	25.11***
	(3.68)	(3.16)	(2.82)
C2	43.97***	37.92***	36.78***
	(5.33)	(4.47)	(4.22)
C3	43.91***	40.55***	37.39***
	(5.33)	(4.73)	(4.19)
*C1*High Opacity*	0.02	-8.29**	-5.48
	(0.00)	(-2.12)	(-1.58)
*C2*High Opacity*	-9.69***	-10.85***	-12.41***
	(-2.78)	(-3.19)	(-3.90)
*C3*High Opacity*	-0.48	-1.30	-3.23
	(-0.15)	(-0.33)	(-1.03)
*C1*FACT*	-4.68	1.20	2.82
	(-0.93)	(0.24)	(0.91)
*C2*FACT*	-12.48***	-3.43	-1.54
	(-2.85)	(-0.79)	(-0.35)
*C3*FACT*	-7.76**	-4.68	0.17
	(-1.97)	(-0.98)	(0.04)
*C1*High Opacity*FACT*	-9.90*	4.88	-1.92
	(-1.94)	(0.89)	(-0.53)
*C2*High Opacity*FACT*	3.42	7.04	9.00*
	(0.68)	(1.39)	(1.71)
*C3*High Opacity*FACT*	-2.69	0.12	4.90
	(-0.57)	(0.02)	(1.10)
Year Fixed Effects	Yes	Yes	Yes
Control variables	Yes	Yes	Yes
No. Obs.	1150	1150	1150
No. Banks	330	330	330

Variable definitions: Dependent variable is DP (dividend payouts) = cash dividend related to the period/earnings. High Opacity= dummy variable equals one if the opacity composite index is higher than the sample median. FACT: High Protect = dummy variable equals one if the index for degree of minority shareholders protection is higher than the sample median; Strong Supervisory=dummy variable equals one if the supervisory regime index is higher than the sample median; Crisis=dummy variable equals one during the financial crisis period 2007 -2012. z-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***. Standard error is adjusted for clustering on bank.*

Table 8. Wald tests for differences in dividend payout ratios for high vs. low opacity and for different levels of shareholder protection (computed from Table 7).

			Opacity		Difference in Coefficient
			Low	High	High - Low Opacity **(a)**
Protect	Low	C1	32.32***	32.34***	0.02
		C2	43.97***	34.28***	-9.69***
		C3	43.91***	43.43***	-0.48
	High	C1	27.64***	17.76**	-9.88***
		C2	31.49***	25.22***	-6.27
		C3	36.15***	32.98***	-3.17
Difference in Coefficient High - Low Protect **(b)**			-4.68	-14.58***	
			-12.48***	-9.06**	
			-7.76**	-10.45***	

p<0.1*, p<0.05** and p<0.01***

Variable definitions: The opacity measure is the opacity composite index (Opacity); Protect is the level of shareholder protection. The number in the Table is sum of coefficients from Equation (2), depending on each cluster, the degree of opacity, and the level of shareholder protection.

Table 9. Wald tests for differences in dividend payout ratios for high vs. low opacity and for different levels of supervisory strength (computed from table 7).

			Opacity		Difference in Coefficient
			Low	High	High - Low Opacity **(a)**
Supervisory	Weak	C1	27.72***	19.43***	-8.29**
		C2	37.92***	27.07***	-10.85***
		C3	40.55***	39.25***	-1.3
	Strong	C1	28.92***	25.51***	-3.41
		C2	34.49***	30.68***	-3.81
		C3	35.87***	34.69***	-1.18
Difference in Coefficient High - Low Protect **(b)**		C1	1.2	6.08	
		C2	-3.43	3.61	
		C3	-4.68	-4.56	

p<0.1*, p<0.05** and p<0.01***

Variable definitions: The opacity measure is the opacity composite index (Opacity); Supervisory is the level of the supervisory regime index. The number in the Table is sum of coefficients from Equation (2), depending on each cluster, the degree of opacity, and the strength of supervisory regimes.

4.3 Impact of the 2008 global financial crisis

We further investigate whether European banks change their dividend policy during the financial crisis of 2007-2008 and the following sovereign debt crisis. Acharya *et al.* (2009) report that banks in the U.S. and in Europe had been paying out significant dividends before the crisis period, but also during the crisis period. The authors explain the persistence of dividend payments during the crisis period by the conflict of interest between shareholders and debtholders that leads shareholders to prefer immediate payouts when banks are financially distressed. Dividends are then paid to shareholders at the expense of debtholders, including regulators and taxpayers who fund bailouts. Kanas (2013) also provides evidence that the Prompt Corrective Action framework was ineffective in curbing dividend behavior. However, he also shows that the introduction of the Troubled Asset Relief Program and the increase in the deposit insurance cap in 2008 entail the elimination of both effects. Abreu and Gulamhussen (2013) find that even U.S. bank holding companies that were undercapitalized before the financial crisis of 2007-2008 paid higher dividends, but they stop doing so during the financial crisis when regulators pressure was greater.

In line with this literature, we examine whether European banks have changed their dividend policy during the financial crisis compared to the non-crisis period; more specifically we aim to address whether banks with high degrees of opacity relax or amplify their entrenchment behavior during the crisis period. In order to address this issue, we rely on the specification in Equation (2) where the variable *FACT* now represents the dummy variable $Crisis_t$, taking the value of one during the financial crisis period 2007-2012 and zero otherwise. The estimation results are given in the third column of Table 7 and Table 10 provides dividend payout ratios and Wald tests for banks with high and low degrees of opacity across clusters, before and during the financial crisis period.

Our results show that banks in Clusters 1 and 2 do not change their behavior during the crisis period compared to the non-crisis period (see Wald tests in Table 10, column (a)). For these two clusters, we observe as previously that banks with higher degrees of opacity pay fewer dividends than banks with lower degrees of opacity, not just during the non-crisis period but also during the crisis period. The persistence of the entrenchment behavior of insiders (either managers or majority shareholders) during

the crisis period indicates that benefits of any private extraction dominate those of increasing immediate payments during a period of financial trouble.

Table 10. Wald tests for differences in dividend payout for high vs. low opacity in crisis and non-crisis time (computed from table 7).

			Opacity		Difference in Coefficient
			Low	High	High - Low Opacity **(a)**
Crisis	No	C1	34.93***	26.49***	-8.44*
		C2	44.41***	29.80***	-14.60***
		C3	42.56***	39.36***	-2.7
	Yes	C1	28.79***	23.82***	-4.96*
		C2	36.27***	28.88***	-7.39**
		C3	37.27***	35.60***	-1.67
Difference in Coefficient Crisis – no crisis **(b)**		C1	-6.14	-2.67	
		C2	-8.13	-0.92	
		C3	-5.29	-4.26	

p<0.1*, p<0.05** and p<0.01***

Variable definitions: The opacity measure is the opacity composite index (Opacity); Crisis is the dummy variable that takes the value of one in 2007-2012 and zero otherwise. The number in the Table is sum of coefficients from Equation (2), depending on each cluster, the degree of opacity, and the economic condition.

5. Robustness checks

We carry out several additional robustness checks on our empirical results.

Firstly, we employ the ratio dividends to total assets as an alternative variable to measure the dividend payout. The results obtained in Tables 5 to 10 are similar when we use this measure as dependent variables (see Tables A3-A6).

Secondly, we include alternatively two other controlling variables: (i) the dummy variable $Listed_{ij,t}$ that takes the value of one if a bank is listed on a stock market, and zero otherwise; (ii) the creditor rights index ($CreditorRights_j$) of La Porta *et al.* (1998) and Djankov *et al.* (2007); this index measures the legal protection of creditors in case of reorganization or liquidation of the debtor,[38] and ranges from 0 to 4, with higher values indicating stronger creditor protection. Luxembourg is excluded from our sample when we include the creditor rights index as the value of this index is not

[38] The creditor rights index represents several elements: (i) if creditors' consent is required to file for reorganization, (ii) if secured creditors are able to take possession of collateral assets once the reorganization petition has been approved (no automatic stay), (iii) if secured creditors are ranked first in the distribution of the proceeds that result from the disposition of the assets of a bankrupt firm, and (iv) whether the debtor does not retain the administration of its property pending the resolution of the reorganization.

provided for this country. Our results are robust when we include these additional control variables (see Table A7 Appendix A).

We then rerun our Equations (1) and (2) by excluding banks that change clusters during the sample period. Results are reported in Table A8 for Equation (1) and Tables A9 and A10 for Equation (2) when we consider the level of shareholder protection and the supervisory strength, respectively (Appendix A); we only report the test of difference between payout ratios for banks with high and low opacity, for each Cluster (column (a) of Tables 8 and 9). This leaves again our results unchanged.

We further use the third quartile of the index $Opacity_{ij,t}$ and $Protect_j$ instead of the median of the sample to define the dummy variables $High\ Opacity_{ij,t}$ and $High\ Protect_j$. Our results are unchanged with high levels of shareholder protection that help to constraint the opportunistic entrenchment behavior of majority shareholders in banks that display high degrees of opacity, while stronger supervisory regimes moderate the opportunistic behavior of both managers and majority shareholders (see Tables A8-A10 in Appendix A).

Then, we also exclude banks of which share 1 (the largest shareholder) is greater than 98% from *Cluster 3*. We find similar results, and our conclusion remains unchanged (see Tables A8-A10 in Appendix A).

Finally, we investigate whether the type of the majority shareholder has an impact on the dividend policy of banks. The existing literature highlights that dividend payments are dependent on the identity of the largest shareholder. Institutional investors as majority shareholder have the resources, expertise and incentives to monitor and influence dividend payments. Prior empirical studies show that institutional investors require firms to pay dividends to enjoy preferential tax treatment, but without demanding higher payout ratios (Grinstein & Michaely 2005). Banking firms are also often credited with having a comparative advantage in monitoring firms. In line with this hypothesis, Goergen *et al.* (2005) find that firms with banks as major shareholder are more willing to omit dividend payments than firms controlled by other types of shareholder. Families as majority shareholders, on the other hand, might have stronger incentives to pursue private benefits (Claessens *et al.* 2002). However, prior empirical studies find that dividend payout ratios are lowest in firms controlled by individuals or families (Gugler 2003; Renneboog & Trojanowski 2006). This can be linked to reputational effects and controlling families caring about the long-term viability of the firm, resulting in higher monitoring of managers. Impact of government ownership on

bank dividend payments might also be ambiguous (Gugler 2003; Onali *et al.* 2015). On one hand, one could argue that governments pursue a maximizing shareholder value objective and therefore require higher dividend payments. On the other hand, if the objective of governments is to protect depositors' interest and to avoid economic and political/reputational costs in case of bank default, government ownership may also lead to lower dividend payouts. Onali *et al.* (2015) find, for a sample of European listed banks, that government ownership and presence of government officials in the board reduce dividend payments.

To investigate the impact of the type of the majority shareholder on dividend payout ratios, we follow the BvD Bankscope classification in differentiating between the shareholder types. We compute five different dummy variables taking the value of one if the majority shareholder is either a bank, an institutional investor, an industrial firm, a state, or an individual/family. We put all the remaining categories of shareholders (managers, public, foundations, and unnamed shareholders) in the category "others".[39] In our sample, banks' dominant shareholders fall predominantly into the categories of banks, institutional investors and industrial firms. Dominant shareholdings by the government and individuals/families, on the other hand, are much less common in our sample. As we only have 9 banks where the majority shareholder is state and 33 banks where the majority shareholder is an individual/family, we can only run Equation (1) by replacing the cluster dummy variables by the shareholder type dummy variables, but we cannot run Equation (2) where we need to further differentiate banks according to their degree of opacity. Table A11 in Appendix A shows that banks which pay the lowest dividends are those where the majority shareholder is an individual or a family. This is consistent with the hypothesis that the incentives for expropriation might be stronger for individuals/families as they are more able to efficiently divert benefits to themselves (Claessens *et al.* 2002). The highest dividends are paid when the majority shareholder is a bank, in line with the findings of Goergen *et al.* (2005).

We then test that are our results are not driven by banks where the dominant shareholder is an individual/a family or a government by excluding them. We find similar results, with significantly higher payout ratios for banks in Clusters 1 and 2 having higher degrees of opacity (see Tables A8-A10 in Appendix A).

[39] We do not have enough observations for this to consider them as separate groups.

6. Conclusion

We empirically examined whether dividend payout decisions of banks depend on the degree of asymmetric information faced by their outsiders, and on the level of ownership concentration. For this, we built a novel database on listed and non-listed European commercial banks for the period 2004–2012 with detailed information on banks' individual ownership structure. We used a clustering approach to distinguish between banks with different degrees of ownership concentration. We also constructed a synthetic measure of banks' opacity for listed and non-listed banks based on four sources of information asymmetry.

We find that banks with either a concentrated or a dispersed ownership structure have lower payout ratios when they have higher degrees of opacity. These results support the entrenchment behavior for banks displaying higher degree of opacity and where extraction of private benefit might be therefore more difficult to detect, with insiders (either managers or majority shareholders) decreasing dividends to potentially increase the amount of free cash flow they can divert for their private consumption. Our results therefore support the hypothesis of an entrenchment behavior of insiders, independently of the nature of the conflict of interest, be it either between managers/shareholders or majority shareholders/minority shareholders.

Further analysis shows that a higher level of shareholder protection helps to constrain the entrenchment behavior of majority shareholder but not the one of managers. However, we find that stronger supervisory regimes where regulatory authorities do on-site examinations in order to make an overall assessment of banks, contribute to moderate the entrenchment behavior of both majority shareholders and managers. We also find that banks' dividend payout decisions are not modified during the crisis period compared to the non-crisis period.

Our results provide therefore robust empirical support for the entrenchment behavior for banks with either a concentrated or a dispersed ownership structure when outsiders face a relatively high degree of asymmetric information. This is a problem that might make it more difficult for banks to raise capital. It is therefore worthwhile to determine governance mechanisms that could lead to an optimal dividend policy to protect and attract minority shareholders.

Our findings are in line with the recommendation of the Federal Reserve Board (FRB, 2011) and the Basel Committee on Banking Supervision (BCBS, 2011) of having

greater oversight over the dividend policy of banks. The reform of Basel 3 suggests imposing restrictions on dividends for banks that do not satisfy regulatory solvency requirements. However, our findings suggest that such restrictions might have an unintended impact by amplifying the entrenchment behavior of banks with high degrees of opacity.

If regulators want to allow signaling and agency mechanisms to function, this requires a lessening of information asymmetry by doing on-site examinations and imposing more transparency and strict information disclosures. Our findings also suggest that existing corporate mechanisms need to be improved to mitigate agency conflicts between insiders (managers or majority shareholders) and outsiders. Overall, to arrive at more efficient capital markets in Europe, better corporate governance mechanisms and increased transparency are called for.

Appendix A

Table A1. Correlation matrix of opacity measures

Variables	Opacity	EM	EF	MF	Loan
Opacity	1.000				
EM	0.285*	1.000			
EF	0.343*	0.056	1.000		
MF	-0.380*	-0.135*	-0.049	1.000	
Loan	0.373*	0.052	-0.092*	0.301*	1.000

Variable definitions: Opacity = composite index of opacity measures (EM, EF, MF and Loan); EM=earnings management; EF=earnings forecast error; MF= the negative value of (long term + short term market funding)/total assets; Loan = net loans/total assets. With p<0.05.*

Table A2. Correlation Matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 C1	1.000														
2 C2	-0.349*	1.000													
3 C3	-0.553*	-0.575*	1.000												
4 Opacity	-0.079*	0.077*	-0.002	1.000											
5 Protect	0.142*	-0.206*	0.047	0.107*	1.000										
6 Supervisory	0.050	-0.243*	0.159*	0.035	0.600*	1.000									
7 ROA	0.005	-0.054	0.048	0.489*	0.109*	0.063*	1.000								
8 Assets growth	0.086*	0.001	-0.079*	0.092*	0.091*	0.092*	0.120*	1.000							
9 Size	0.145*	-0.129*	-0.016	-0.473*	-0.060*	0.058*	-0.342*	-0.023	1.000						
10 M&A	0.175*	-0.014	-0.136*	-0.174*	0.024	0.082*	-0.037	0.078*	0.356*	1.000					
11 Ln Z Score	-0.010	0.052	-0.032	0.005	-0.013	-0.008	0.056*	0.008	-0.112*	-0.008	1.000				
12 High Capitalized	-0.287*	-0.014	0.262*	0.193*	0.182*	0.133*	0.130*	-0.137*	-0.362*	-0.164*	-0.045	1.000			
13 High Charter	-0.106*	-0.045	0.128*	0.344*	0.089*	-0.000	0.229*	-0.022	-0.480*	-0.164*	-0.002	0.288*	1.000		
14 Distress	0.055	-0.017	-0.032	-0.086*	-0.073*	-0.029	-0.065*	-0.036	0.103*	0.132*	-0.091*	-0.063*	-0.021	1.000	
15 GDP growth	0.016	-0.074*	0.058*	0.059*	0.182*	0.134*	0.173*	0.179*	-0.027	0.006	0.076*	0.012	-0.013	-0.105*	1.000

Variable definitions: C1-C3 = clusters dummy variables; Opacity= composite index of opacity measures (EM, EF, MF and Loan); Protect = Index of degree of minority shareholders protection, which is Rule of Law index multipied by revised Anti Director index (Djankov et al. 2008); Supervisory=banks supervisory regime index; ROA = Return on Assets; Assets growth = annual growth of total assets; Size = log of total assets; M&A = dummy variable equals one the year a bank acquires another financial institutions; Ln ZScore = log of z score, calculated over 3-year rolling windows; High Capitalized = dummy variables equals one if the bank risk-weighted capital ratio at the beginning of the period is larger than sample median; High Charter = dummy variable equals one if the ratio of customer deposits to total assets is larger than the sample median; Distress=dummy variable takes value of one if banks are distressed; GDP growth = annual GDP growth. p<0.05.*

Table A3. Degree of opacity, ownership & dividend policy of European banks for the period 2004-2012.

Dependent: *Div/TA*	(Equation 1)	(Equation 1 without interaction terms)
C1	0.60***	0.46*
	(5.66)	(1.72)
C2	0.60***	0.46**
	(3.79)	(2.01)
C3	0.77***	0.68**
	(6.58)	(2.21)
*C1*High Opacity*	-0.15**	
	(-2.52)	
*C2*High Opacity*	-0.16***	
	(-2.75)	
*C3*High Opacity*	-0.26*	
	(-1.96)	
Opacity		0.03
		(0.58)
High Protect	-0.14**	-0.13**
	(-2.18)	(-2.27)
ROA	0.34***	0.32***
	(7.22)	(6.42)
Assets growth	-0.01***	-0.01***
	(-3.47)	(-3.66)
Size	-0.15*	-0.14*
	(-1.68)	(-1.70)
M & A	0.11	0.09
	(1.04)	(1.24)
LnZScore	-0.04	-0.04
	(-1.11)	(-1.05)
High Capitalized	0.09**	0.10**
	(2.50)	(2.36)
High Charter	-0.15	-0.12
	(-1.04)	(-1.09)
Distress	-0.06	-0.07
	(-0.78)	(-0.90)
GDP growth	0.01	0.01
	(0.79)	(0.68)
Year Fixed Effects	Yes	Yes
No. Obs.	1277	1277
No. Banks	345	345

Variable definitions: Dependent variable: Div/TA = cash dividend related to the period/total assets. Independent variables: C1-C3 = clusters dummy variables; Opacity = composite index of four opacity measures (EF, EM, MF, and Loan as defined in section 2.3); High Opacity = dummy variable equals one if the opacity composite index of a bank is higher than the sample median; High Protect = dummy variable equals one if the index for degree of minority shareholders protection is higher than the sample median; ROA = Return on Assets; Assets growth = annual growth of total assets; size = log of total assets; M&A = dummy variable equals one the year a bank acquires another financial institutions; Ln ZScore = log of z score, calculated over 3-year rolling windows; High Capitalized = dummy variables equals one if the bank risk-weighted capital ratio at the beginning of the period is larger than sample median; High Charter = dummy variable equals one if the ratio of customer deposits to total assets is larger than the sample median; Distress=dummy variable takes value of one if banks are distressed; GDP growth = annual GDPgrowth. z-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***. Standard error is adjusted for clustering on bank.*

Table A4. Wald tests for differences in dividend payout ratio for high vs. low opacity and for different levels of shareholder protection.

			Opacity		Difference in Coefficient
Dependent: *Div/TA*			Low	High	High - Low Opacity **(a)**
Protect	Low	C1	1.37***	1.09***	-0.28***
		C2	1.22***	1.07***	-0.15***
		C3	1.49***	1.36***	-0.13
	High	C1	1.04***	1.04***	0
		C2	1.08***	1.16***	0.08
		C3	1.38***	1.1***	-0.28**
Difference in Coefficient High - Low Protect **(b)**			-0.33***	-0.05	
			-0.14*	0.09	
			-0.11	-0.26	

p<0.1*, p<0.05** and p<0.01***

Variable definitions: The opacity measure is the opacity composite index; Protect is the level of shareholder protection.

The number in the Table is sum of coefficients from Equation (2), depending on each cluster, the degree of opacity, and the level of shareholder protection.

Table A5. Wald tests for differences in dividend payout ratios for high vs. low opacity and for different level of supervisory strength.

			Opacity		Difference in Coefficient
Dependent : *Div/TA*			Low	High	High - Low Opacity **(a)**
Supervisory	Weak	C1	0.91***	0.76***	-0.15*
		C2	0.89***	0.76***	-0.13*
		C3	1.23***	1.09***	-0.14
	Strong	C1	0.89***	0.73***	-0.16
		C2	1.11***	1***	-0.11
		C3	0.95***	1.08***	0.13*
Difference in Coefficient High - Low Protect **(b)**		C1	-0.02	-0.03	
		C2	0.22*	0.24**	
		C3	-0.28	-0.01	

p<0.1*, p<0.05** and p<0.01***

Variable definitions: The opacity measure is the opacity composite index; Supervisory is the level of the supervisory regime index.

The number in the Table is sum of coefficients from Equation (2), depending on each cluster, the degree of opacity, and the strength of supervisory regimes.

Table A6. Wald tests for differences in dividend payout for high vs. low opacity in crisis and non-crisis time.

			Opacity (OPX)		Difference in Coefficient
Dependent : *Div/TA*			Low	High	High - Low Opacity **(a)**
Crisis	Yes	C1	0.96***	0.81***	-0.15**
		C2	0.94***	0.82***	-0.12*
		C3	1.18***	1.08***	-0.1
	No	C1	0.95***	0.91***	-0.04
		C2	0.99***	0.93***	-0.06
		C3	1.01***	1.11***	0.1
Difference in Coefficient Crisis – no crisis **(b)**		C1	-0.01	0.1	
		C2	0.05	0.11	
		C3	-0.17	0.03	

p<0.1*, p<0.05** and p<0.01***

Variable definitions: The opacity measure is OPX the opacity composite index; Supervisory is the level of the supervisory regime index.
The number in the Table is sum of coefficients from Equation (2), depending on each cluster, the degree of opacity, and the economic condition.

Table A7. Degree of opacity, ownership & dividend policy of European banks for the period 2004-2012.

Dependent: *DP*	(Equation 1)	(Equation 1 without interaction terms)
C1	33.83***	37.30***
	(3.47)	(3.19)
C2	41.67***	43.11***
	(4.38)	(3.69)
C3	43.27***	47.25***
	(4.39)	(3.89)
*C1*High Opacity*	-5.63**	
	(-2.00)	
*C2*High Opacity*	-9.80***	
	(-3.46)	
*C3*High Opacity*	-4.10	
	(-1.38)	
Opacity		-1.93**
		(-2.28)
High Protect	-4.81**	-4.41*
	(-2.07)	(-1.92)
CreditorRights	-4.92***	-4.83***
	(-4.71)	(-4.57)
Listed	-8.32***	-8.53***
	(-2.77)	(-2.79)
ROA	2.80	3.01*
	(1.62)	(1.71)
Assets growth	-0.10*	-0.10*
	(-1.87)	(-1.85)
Size	0.11	0.42
	(0.16)	(0.58)
M & A	-3.53	-3.60
	(-1.15)	(-1.19)
LnZScore	4.60***	4.71***
	(4.39)	(4.46)
High Capitalized	3.34	3.60
	(1.47)	(1.57)
High Charter	2.22	2.99
	(0.81)	(1.08)
Distress	-6.36	-6.41
	(-1.09)	(-1.05)
GDP growth	0.46	0.46
	(0.71)	(0.72)
Year Fixed Effects	Yes	Yes
No. Obs.	1150	1150
No. Banks	330	330

Variable definitions: Dependent variable: DP = cash dividend related to the period/earnings. Independent variables: C1-C3 = clusters dummy variables; Opacity = composite index of four opacity measures (EF, EM, MF, and Loan as defined in section 2.3); High Opacity = dummy variable equals one if the opacity composite index of a bank is higher than the sample median; High Protect = dummy variable equals one if the index for degree of minority shareholders protection is higher than the sample median; CreditorRights = Creditor Rights Index (La Porta et al. 1998; Djankov et al. 2007); Listed = dummy for listed banks; ROA = Return on Assets; Assets growth = annual growth of total assets; size = log of total assets; M&A = dummy variable equals one the year a bank acquires another financial institutions; LnZScore = log of z score, calculated over 3-year rolling windows; High Capitalized = dummy variables equals one if the bank risk-weighted capital ratio at the beginning of the period is larger than sample median; High Charter = dummy variable equals one if the ratio of customer deposits to total assets is larger than the sample median; Distress=dummy variable takes value of one if banks are distressed; GDP growth = annual GDPgrowth. z-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***. Standard error is adjusted for clustering on bank.*

Table A8. Degree of opacity, ownership & dividend policy of European banks for the period 2004-2012.

	(1)	(2)	(3)	(4)
Dependent: *DP*	Fixed cluster only	*High Opacity* > 3rd quartile of *Opacity*	Share1 in C3< 99%	No family & no gov. ownership
C1	31.61***	30.50***	29.00***	31.67***
	(3.43)	(3.39)	(3.73)	(3.45)
C2	42.64***	37.76***	35.64***	40.48***
	(4.91)	(4.29)	(4.86)	(4.56)
C3	44.21***	40.31***	34.44***	41.42***
	(5.05)	(4.42)	(4.38)	(4.57)
*C1*High Opacity*	-6.63**	-10.49***	-6.44**	-6.07**
	(-2.06)	(-3.40)	(-2.25)	(-1.99)
*C2*High Opacity*	-6.45*	-9.34***	-8.26***	-9.66***
	(-1.78)	(-3.34)	(-3.03)	(-3.39)
*C3*High Opacity*	-1.51	-2.65	-5.22	-1.73
	(-0.47)	(-1.09)	(-1.37)	(-0.63)
High Protect	-8.98***	-8.08***	-7.87***	-8.09***
	(-3.98)	(-3.88)	(-3.38)	(-3.82)
Controls	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
No. Obs.	905	1150	750	1108
No. Banks	301	330	226	322

We estimate equation 1 on: (1) Subsample without banks that move from one cluster to other clusters (fixed cluster only); (2) Full sample with different definition of variable High Opacity, defined as: a bank is categorized in high opacity subsample if its opacity index (OPX) is greater than sample 3rd quartile; (3) Subsample of which share1 in Cluster 3 must be lower than 99%; and (4) Subsample without family owned and government owned banks. Variable definitions: Dependent variable: DP = cash dividend related to the period/earnings. Independent variables: C1-C3 = clusters dummy variables; Opacity = composite index of four opacity measures (EF, EM, MF, and Loan as defined in section 2.3); High Opacity = dummy variable equals one if the opacity composite index of a bank is higher than the sample median; High Protect = dummy variable equals one if the index for degree of minority shareholders protection is higher than the sample median. z-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***. Standard error is adjusted for clustering on bank.*

Table A9. Robustness test - Degree of opacity, ownership concentration and dividend policy for different levels of shareholder protection and supervisory regime strength, for European commercial banks over the period 2004-2014 (equation 2).

		(1)	(2)	(3)	(4)
Dependent: *DP*		Fixed cluster only	*High Opacity* > 3rd quartile of *Opacity*	Share1 in C3< 99%	No family & no gov. Ownership
Low Protect	C1	1.16	-2.66	-0.74	1.21
	C2	-5.1*	-6.28**	-9.17***	-10.27***
	C3	-0.84	-2.77	1.04	-0.53
High Protect	C1	-10.07**	-12.98**	-9.6***	-10.49***
	C2	-9.21*	-22.38***	-6.81	-7.39*
	C2	-2.66	-13.55**	-9.07	-3.33

This table reports the difference of dividend payout ratio between banks with high opacity and banks with low opacity, either in low or high shareholder protection environment (column a of table 8). We estimate equation 2 and compute the average payout ratio for each group and each cluster on; (1) Subsample without banks that move from one cluster to other clusters (fixed cluster only); (2) Full sample with different definition of variable High Opacity, defined as: a bank is categorized in high opacity subsample if its opacity index (OPX) is greater than sample 3rd quartile; (3) Subsample of which share1 in Cluster 3 must be lower than 99%; and (4) Subsample without family owned and government owned banks. Dependent variable: DP = cash dividend related to the period/earnings. C1-C3 = clusters dummy variables.

Table A10. Robustness test - Degree of opacity, ownership concentration and dividend policy for different levels of shareholder protection and supervisory regime strength, for European commercial banks over the period 2004-2014 (equation 2).

		(1)	(2)	(3)	(4)
Dependent: *DP*		Fixed cluster only	*High Opacity* > 3rd quartile of *Opacity*	Share1 in C3< 99%	No family & no gov. Ownership
Weak Supreg	C1	-9.37**	-10.47**	-7.53**	-6.6*
	C2	-7.05*	-9.58**	-9.97***	-11.89***
	C3	-1.16	0.32	-2.78	-1.55
Strong Supreg	C1	-2.53	-2.48	-4.28	-6.17
	C2	-6.37	-7.69*	-4.11	-3.45
	C2	-1.31	-7.09*	-5.38	-1.1

This table reports the difference of dividend payout ratio between banks with high opacity and banks with low opacity, either in weak or strong supervisory strength regime (column a of table 8). We estimate equation 2 and compute the average payout ratio for each group and each cluster on: (1) Subsample without banks that move from one cluster to other clusters (fixed cluster only); (2) Full sample with different definition of variable High Opacity, defined as: a bank is categorized in high opacity subsample if its opacity index (OPX) is greater than sample 3rd quartile; (3) Subsample of which share1 in Cluster 3 must be lower than 99%; and (4) Subsample without family owned and government owned banks. Dependent variable: DP = cash dividend related to the period/earnings. C1-C3 = clusters dummy variables.

Table A11. Ownership type and dividend payout of European commercial banks for the period 2004-2012

Dependent: *DP*						
Bank	5.52***					
	(2.91)					
Institutional		-0.79				
		(-0.30)				
Industrial			-5.47***			
			(-2.65)			
State				-9.39		
				(-0.75)		
Individual/Family					-8.95**	
					(-2.11)	
Others						1.81
						(0.39)
High Opacity	-2.30***	-2.36***	-2.28***	-2.33***	-2.34***	-2.34***
	(-3.07)	(-3.16)	(-3.05)	(-3.13)	(-3.13)	(-3.15)
High Protect	-3.35***	-3.55***	-3.51***	-3.58***	-3.50***	-3.57***
	(-6.93)	(-7.20)	(-7.23)	(-7.29)	(-7.18)	(-7.25)
Constant	69.75***	74.24***	73.71***	73.65***	74.63***	73.92***
	(7.22)	(7.79)	(7.75)	(7.74)	(7.82)	(7.78)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
No. Observation	1,150	1,150	1,150	1,150	1,150	1,150
No. Bank	330	330	330	330	330	330
R-squared (overall)	0.15	0.12	0.14	0.13	0.13	0.12

Variable definitions: The dependent variable is DP (dividend payouts) = cash dividend related to the period/earnings; Bank, Institutional, Industrial, State, Individual/Family = dummy variable equals one if the largest owner is a bank, an institutional investor, an industrial firm, the state or an individual/family, respectively; Others= dummy variable equals one if the largest shareholder is either a manager, the public, a foundation or an unnamed shareholders; High Opacity= dummy variable equals one if the opacity composite index is higher than the sample median; High Protect = dummy variable equals one if the index for degree of shareholder protection is higher than the sample median. z-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***. Standard error is adjusted for clustering.*

Appendix B

1. Estimation of an earnings prediction model

The capacity of investors to forecast the profitability of a firm relies on the information they have. We assume that the rational prediction of stock markets may be captured by the prediction of a well-specified regression model based on publicly available information. Under this assumption, a positive residual of the regression means that stock markets underestimated banks' earnings. In this case, the actual earning turns out to be larger than the ones predicted by the stock market model. On the contrary, the residual of regression is negative when the earning predicted by the stock market is larger than the actual earning. In both cases, publicly available information do not permit to perfectly forecast the profitability. We follow Park (1999) and Crouzille *et al.* (2004) by considering that the residual of an earnings prediction model can be used as a proxy to measure banks private information. We build on an empirical specification that is close to those in Crouzille *et al.* (2004), that we augment with other explanatory variables following Dietrich and Wanzenried (2014):

$$\begin{aligned} ROA_{ij,t} = \ & \alpha_0 + \beta_1 ROA_{ij,t-1} + \beta_2 Expenses_{ij,t-1} + \beta_3 Deposit_{ij,t-1} + \beta_4 ETA_{ij,t-1} \\ & + \beta_5 Loan_{ij,t-1} + \beta_6 NII_{ij,t-1} + \beta_7 Cost\ of\ Fund_{ij,t-1} + \beta_8 Dispersion_{ij,t-1} \\ & + \beta_9 Bank\ Concentration_{j,t-1} + \beta_{10} ROAI_{j,t-1} + \beta_{11} GDPgrowth_{j,t-1} \\ & + \varepsilon_{i,t+1} \qquad (A1) \end{aligned}$$

where $ROA_{ij,t}$ is the return on asset of bank i at time t. *Expenses* is operating expense to operating profit that reflects operational efficiency; $Deposit_{ij,t-1}$ is customer deposit divided by total assets; $ETA_{ij,t-1}$ is the ratio of equity to total assets measuring bank liquidity and leverage; $Loan_{ij,t-1}$ is the ratio of net loan to total assets; $NII_{ij,t-1}$ is the ratio of non-interest income to total income, measuring income diversification; $Cost\ of\ Fund_{i,t}$ is the ratio of interest expenses over total deposits; $Dispersion_{ij,t-1}$ is a measure of ownership dispersion; $Bank\ Concentration_{j,t-1}$ is the Herfindahl-Hirschman Index of total assets for each year on each country; $ROAI_{j,t-1}$ is the average ROA of the banking Industry for the whole country for each year; $GDPgrowth_{jt-1}$ is the growth rate of gross domestic product of each country.

We perform the estimation each year using OLS and we use the absolute value of the residual from the regression estimations to generate our measurement for bank opacity *EF*. The asymmetric information between insiders and outsiders should be relatively high for a bank i when the absolute value of residual of the regression ε_i is relatively high.

2. Degree of earnings management

We build on an empirical panel specification that is close to those in Greenawalt and Sinkey (1988), Bikker and Metzemakers (2005), Anandarajan *et al.* (2007) and Bouvatier *et al.* (2014) to measure the degree of earning management:

$$LLP_{ij,t} = \alpha_0 + \beta_1 LLP_{ij,t-1} + \beta_2 Loan_{ij,t} + \beta_3 NL\ growth_{ij,t} + \beta_4 GDP\ growth_{j,t} + \beta_5 COM_{ij,t} + \beta_6 ER_{ij,t} + \beta_7 SIGN_{ij,t} + \beta_8 ETA_{ij,t-1} + \alpha_t + \varepsilon_{ij,t} \qquad (A2)$$

where $LLP_{ij,t}$ is the ratio of loan loss provision to total assets.

The non-discretionary component represents loan loss provisions made to cover expected credit losses. In our specification it is identified by $Loan_{ij,t}$ the ratio of net loan to total assets, $NL\ growth_{ij,t}$ the net loan growth, $COM_{ij,t}$ the ratio of commission and fee income to total assets and $GDPgrowth_{jt}$ the growth rate of gross domestic product.

The earnings management results from two different management objectives. Banks can use their loan loss provisions (LLP) to smooth their income; banks understate (overstate) LLP when earnings are expected to be low (high) relative to that of other years (inter-temporal smoothing). If banks use LLP to smooth earnings, then we would expect a significantly positive relation between earnings before taxes and loan loss provisions $ER/TA_{ij,t}$ and LLP. Banks can also use LLP to signal their financial strength. If signaling is an important incentive in choosing LLP, then we should observe a significantly positive relation between LLP and changes in future earnings before taxes and LLP, with $SIGN_{ij,t}$ defined as $((ER_{it+1} - ER_{it})/0.5(TA_{i,t} + TA_{i,t+1}))$. We also control for a possible capital management behavior, even if scope for such behavior is more limited since Basel 1 and even more so under Basel 2. Banks with low regulatory capital could be more inclined to make loan loss provisions to keep their capital ratio adequate. To control for such behavior, we include the lagged ratio of equity to total assets ($ETA_{ij,t-1}$).

We use GMM system estimation to estimate Equation (A2) with forward orthogonal deviations transformation of the original equation as suggested by Arellano and Bover (1995) and the two-step estimator including the Windmeijer (2005) finite-sample correction. We only instrument the lagged dependent variable and assuming the other explanatory variables are strictly exogenous.

Our results show that European commercial banks use their LLP to smooth their earnings and signal their financial strength. We then compute our earning management variable (*EM*) as follows: $EM_{ij,t} = \beta_6 ER_{ij,t} + \beta_7 SIGN_{ij,t}$.

Chapter 3: Do We Need to Regulate Dividends? The Case of Indonesian Firms, in the Light of Mandatory Dividend Regulation Discussions[40]

[40] This chapter was co-written with Eduardus Tandelilin and Eddy Junarsin.

1. Introduction

A vast literature of studies on dividend policies is readily available, especially for developed countries, yet for over fifty years it has still been one of the most puzzling subjects in corporate finance. Meanwhile, there is less empirical evidence available from developing countries, taking into consideration that there might be a significant difference in the practice of the corporate governance and the dividend policy decision (Mitton 2004). Beside the different practice of corporate governance, the different legal constraints also makes the dividend policy vary widely among countries (La Porta *et al.* 2000; Goyal & Muckley 2013). In their seminal paper, La Porta *et al.* (1998) argue that countries with a civil law origin tend to have lower investor protection and higher barriers to the development of the capital market. Nevertheless, concentrated ownership and family business entrenchment exacerbate the problem of agency conflict coming from the expropriation risk, thus downgrading the soundness of the investment environment. Such a situation implies a high social cost, and it might be necessary for countries with weak investor protection to find alternative ways to reduce this social cost, for example by applying mandatory dividend regulations (Martins & Novaes 2012)[41]. According to Jensen (1986), dividends can solve this issue because paying dividends would reduce free cash flows and thus reduce the possibility of expropriation or managerial perks. However, some argue that mandatory dividend rules would limit companies' abilities and opportunities to invest, consequently hampering the firms' growth. Hence, there is a trade-off between cost and benefit, i.e. protecting minority shareholders' rights vs. firms' growth opportunities.

In this paper, we test the dividend life cycle hypothesis in Indonesia, following the recent issue regarding the proposal of mandatory dividend in response to the declining number of dividend payers in Indonesia Stock Exchange (IDX). Implementing the regulation is not a clear-cut issue, there are pro and contra arguments from the stakeholders. Indonesia, like many other emerging market countries in Asia, is indeed experiencing high economic growth. Yet, Indonesia is also facing some problems of governance, e.g. concentrated ownership structures, pyramidal ownership structures, weak investor protection, and the issue of massive corruption that might exacerbate the risk of expropriation. One might argue that dividends are the shareholders' right, and paying dividends might help to keep long-term investors and reduce the speculators in the stock market. From the agency theory perspective, not paying dividends

[41] Countries with weak shareholder protection that have adopted the mandatory dividend regulations are Brazil, Chile, Colombia, Venezuela, and Greece. However, some other countries have dropped this law, for instance Egypt.

might suggest an expropriation by the majority shareholders, i.e. diverting cash for their private benefit (Faccio *et al.* 2001), particularly in countries with weak investor protection (La Porta *et al.* 2000). In this case, mandatory dividends could be a solution. Moreover, Brazil has been successfully applying mandatory dividends, and an empirical research by Martin and Novaes (2012) show that such a regulation does not hamper firms' growth. On the contrary, paying high dividends could be an indication of tunneling or risk shifting by the insiders, which often also happens in countries with low shareholder protection (Johnson *et al.* 2000). One can also argue that in a high economic growth rate emerging market like Indonesia, perhaps retaining profits to re-invest in the growth opportunities is the best decision. The later argument might explain why many listed firms in Indonesia have not paid dividends recently.

The dividend life-cycle hypothesis might shed some light on this conundrum as there are plenty empirical evidences that explain the declining dividend using dividend life-cycle hypothesis. From the firms' life-cycle point of view, firms possibly have different circumstances, .e.g. the need for more capital for business expansion in the earlier phases of the life-cycle while there is an abundant free cash flow, as there are generally fewer investment opportunities in the later stages. It may also give some hints as to when a firm is expropriating minority shareholders through its dividend policy, and when it is not. Finally, one cannot expect all companies with positive earnings to pay dividends as in the proposed regulations, because this may harm the shareholders. A firm in growth phase may need more fund to realize their projects, and paying dividend involuntarily may impede the growth. Designing dividend regulations will prolong the endless debate between the stakeholders since the purpose of the regulation itself is not aimed at an optimal dividend policy that maximizes the firms' values, but to ensure the minority shareholders' protection. However, most of the empirical evidences available are from developed markets. Thus, this study will test the life-cycle hypothesis in developing market with weak investor protection.

Different from the policy paper of Martins and Novaes (2012) where the mandatory dividend regulation has been applied on, this paper aims to provide empirical evidence using dividend life-cycle hypothesis to assess whether mandatory dividend regulation is necessary. This study provides an analysis based on a novel measure of the life-cycle, namely the life-cycle index, which captures the characteristics of non-financial listed firms on the IDX to test the dividend life-cycle hypothesis in Indonesia.

We find evidence that non-financial firms[42] on the Indonesian Stock Exchange (IDX) tend to follow the life-cycle hypothesis. We find that during the observation period from 1995 to 2011, the dividend payment is more prevalent among big firms, and we show that the propensity to pay dividends declined over the period. It indeed confirms the IDX's concern that many firms do not pay dividends. Finally, our findings have a policy implication. Based on our findings, we recommend that the regulation should take into account the firms' life-cycle. Firms should only be required to pay dividends when they reach a particular stage or meet certain characteristics. Any punative action should be taken only against firms who do not pay dividends, although they should be able to, according to their development stage or characteristics. We suggest that the IDX and the Security Exchange Commission stay clear of a one-fits-all policy approach regarding dividend payments.

The remainder of the paper is organized as follows. Section 2 presents a literature review. Section 3 discusses the characteristics of listed Indonesian firms. Section 4 provides data and methods. Section 5 reports the empirical results of the dividend life-cycle hypothesis. Section 6 presents robustness check. Section 7 discusses the results and policy implications. Section 8 summarizes and concludes.

2. Related Literature

There is a declining trend of dividend payments of non-financial firms in the US as well as in other countries, including Indonesia as mentioned above. This trend is initially shown by Fama and French (2001) in the United States. They find that dividend payers have reduced by 46% between 1978 and 1999 due to various reasons, such as the firms are not, by nature, payers of dividends, firms' negative earnings, small sizes, and large investment needs. They argue that there are three characteristics of firms that determined the firms' propensity to pay dividends, i.e. their profitability, investment opportunities and size. After a comprehensive look at the findings of Fama and French (2001), Grullon *et al.* (2002) and DeAngelo *et al.* (2004); DeAngelo *et al.* (2006) come to the conclusion that these findings led to a life-cycle explanation. DeAngelo *et al.* (2006) report that the proportion of non-financial firms in the capital market that pay dividends is higher when the proportion of retained earnings in their total equity are higher, but most of the firms do not pay dividends when their proportion of retained earnings in their total equity is low. They argue that in the early stage of their life-cycle, firms' investment opportunities exceeded the internally generated or earned funds, i.e.

[42] Firms in this study refers to non-financial firms only.

retained earnings, and they therefore either do not pay, or pay less dividends. While, at a more mature stage of the life-cycle, firms' internal funds exceed their investment opportunities, and firms pay more dividends to avoid wasting the cash flow in non-maximizing value investments.

Mueller (1972) is the first to introduce the life-cycle theory of firms. His theory questions whether managers maximized shareholder value or pursued growth in the context of the agency problem between owners and managers. Lease *et al.* (2000) illustrates a more complex dividend life-cycle scenario by considering all the market frictions: the severity of the agency problem, information asymmetry levels, shareholders' equity tax, the flotation costs of issuing new equity, and transaction costs, at each stage. At the very beginning (stage) of the firm (start-up), the investment opportunities are very promising, and thus firms pursue a high growth strategy. Consequently, the capital requirements are enormous. Meanwhile, as a new small business, floatation costs and transaction costs are very high. The equity tax during this stage is also high, and thus paying dividends would make the owners pay even higher taxes. In such conditions, paying no dividends would be an optimal decision to fulfill the investment needs using internally generated capital, which is the cheapest source of capital. At this stage, the asymmetric information between insider and outsider is extremely high; however the agency costs are almost nonexistent as the managers and the owners are still the same. This condition means there is no need for firms to pay dividends. Whereas in the more mature stages, investment opportunities are declining, and the agency conflict is getting higher as the operating cash flow is exceeding investment requirements. At the same time, shareholders' equity tax is declining with institutional ownership, while floatation costs and transaction costs are also getting lower. In such a situation, the firm will pay more in dividends due to the built-up free cash flow as the investment opportunities decline and reduce the agency conflict.

Denis and Osobov (2008), Von Eije and Megginson (2008), and Brockman and Unlu (2011) find similar evidence that dividend policy of non-financial firms follow the firms' life-cycle and age. Bulan *et al.* (2007) also find that firms' ages explained the probability of dividend initiation. More recently, Fairchild *et al.* (2014) also find evidence that supported the life-cycle and free cash flow hypothesis in Thailand. The dividend life-cycle hypothesis seems to gain in popularity by explaining firms' dividend policies and the worldwide disappearing dividend phenomena. More importantly, the dividend life-cycle hypothesis should be a normative model of dividend policy which maximizes firms' values, and at the same time protects the minority shareholders rights. Thus, it will be an appropriate reference for dividend regulation although

none of the literature above discussed regulation implications and differences in institutional settings specifically.

A recent comprehensive survey of Indonesian firms conducted by Baker and Powell (2012) reports that managers of Indonesian firms believe that a dividend policy has an influence on their firms' value. The survey reveals the signaling, the catering, and the life-cycle hypothesis could help explain why managers pay dividends. To the best of our knowledge, there is no empirical research in Indonesia aims at providing a more comprehensive picture of dividend policy by considering the dividend life-cycle hypothesis that should maximize firms' values. Clearly, there is an important research gap that needs to be filled, and there is a need for empirical evidence to support regulation formulation if the regulator intends to regulate dividend payments on the IDX.

3. Listed Indonesian firms characteristics and institutional settings

We consider Indonesian institutional settings and firms' characteristics in our study in examining the dividend life-cycle hypothesis for non-financial firms, in the spirit of the dividend life-cycle hypothesis by Lease *et al.* (2000). By considering these factors, we will be able to disentangle dividend policy in the context of the Indonesian capital market for the purpose of regulatory action.

Indonesia is a developing country and the largest economy in South East Asia. It has emerged from the 2008 financial crisis without any substantial damage. Indonesia's gross domestic product has expanded at a steady rate for almost two decades while the rest of the world is in a recession between 2009 and 2012. The Business Confidence Index in Indonesia is averaged at 106.90[43], considerably higher than many developed countries including France (99) and the United States (58.7). Fitch Ratings rated Indonesia as "Investment grade" in 2011, followed by Moody's in 2012 while S&P's rating stays at BB+. It is deemed as less risky than many emerging markets while promising a high average annual return. Indonesia is also a member of Group of Twenty, signaling a recognition of its strong economic growth. However, in terms of governance, Indonesia is still below average on the world's index. For instance, for Rule of Law in 2012 Indonesia ranked 140th out of 212[44]. Regarding investor protection, Indonesia

[43] Source: OECD business confidence index: https://data.oecd.org/leadind/business-confidence-index-bci.htm
[44] Source: Authors' calculation from World Governance Indicator Database of the World Bank.

adopts France's civil law[45], which is associated with low investor protection (La Porta *et al.* 1998). Even though Indonesia's investment climate is getting better, the issue of corruption and corporate governance are still matters of concern. Due to such a situation, investors may perceive that the expropriation risk is relatively high and will be reluctant to invest in Indonesian firms.

The capital market was established by the colonial government in 1912 but suffered several closed or inactive periods due to World Wars (I and II), economic recessions, national wars, and political turbulence. It was reactivated in 1977, and it has grown rapidly since then. From 1977 to 1989, there were two stock exchanges in Indonesia, which were the Jakarta Stock Exchange and the Surabaya Stock Exchange. To boost the capital markets performance, capital market legislation was enacted by the Capital Market Act no. 8 in 1995. In 2007 the two stock exchanges were merged and named the Indonesian Stock Exchange (IDX). The single arrangement has strengthened the Indonesian capital market and attracted more investors. According to the IDX annual report, the number of listed companies on the IDX has grown substantially from 288 in 1998 to 502 in 2014. Since 1998, the amount of dividends paid by firms listed on the IDX has grown significantly as well. A brief illustration of the institutional settings' of Indonesian firms that are relevant to this study are discussed below.

3.1. Dividend regulation

Dividend policy in Indonesia is only regulated in general terms by the Indonesian Corporate Act Number 40 of 2007. The law mandates full authority for the use of net income and dividend payments to each company's charter. The *Rapat Umum Pemegang Saham* or RUPS (Annual General Meeting of Shareholders) decides on the amount of net income to be made available to the company for establishing compulsory reserve funds[46], and the amount of net income to be distributed to shareholders in the form of dividends[47]. The only condition is that dividends should only be paid if the company has a positive net income[48]. These articles imply that for the privately owned firms, there are no restrictions on the distribution of the net income recorded in the income statement. Consequently, a firm may or may not distribute it to the shareholders. It implies that what makes firms pay dividends is still a puzzle. In the past, the IDX used to have a regulation that required companies that reported a positive net income for

[45] Historically, Indonesia (whose name was Hindia Belanda) is a Dutch colony. This explains the adoption of the civil law system in Indonesia.
[46] Undang-undang Tentang Perseroan Terbatas (Limited Company Law) Number 40 year 2007 article 70 (1).
[47] Undang-undang Tentang Perseroan Terbatas (Limited Company Law) Number 40 year 2007 article 71 (2).
[48] Undang-undang Tentang Perseroan Terbatas (Limited Company Law) Number 40 year 2007 article 71 (3)

at least three years in a row to pay dividends. However, the regulation was revoked because of the market situation at the time. In the earlier years of the stock exchange, there were only a small number of listed companies, and they were still in need of capital to expand, thus paying dividends is seen as burdensome.[49]

As mentioned before, dividend policy has become an issue at the regulatory level, and with practitioners recently, in Indonesia. The IDX now sees this phenomenon as an unfavorable situation. They argue that (1) paying dividends is one of the indicators of good corporate governance practice, and (2) investors do not only want capital gains but also dividends. Therefore, in early 2013 the IDX proposed to enact a stricter regulation on the payment of dividends, that included: (1) The minimum frequency of paying dividends in a particular period of reported positive net income, (2) the minimum amount of net income to be distributed as dividends, and (3) the sanctions for non-compliance.[50]

Not surprisingly, this mandatory dividend plan faces much opposition. For instance, the two largest stakeholders in the capital market, the Indonesian Securities Company Association (Asosiasi Emiten Indonesia/AEI) and the Indonesia Corporate Secretary Association (ICSA) are not immediately on board with the idea of regulating dividend payments, but they finally agreed to consider the plan subject to the content.[51] However as we now near the end of 2015, the IDX has still not produced a finalized draft containing the technical and operational terms of the proposed regulation for further review and discussion. This provides us with the opportunity to investigate the situation further. We need to comprehend why companies do not pay dividends, before implementing this regulation without having a comprehensive understanding of the dividend behavior of listed firms. Although high agency conflict and low investor protection can be the strongest arguments for a mandatory dividend rule, we need to ensure that such a regulation will not hinder the optimal growth of the firms. Furthermore, the number of newly listed firms has grown since 1998 and, as mentioned before, firms do not pay dividends because of the promising growth opportunities in the earlier stages of their life-cycle.

[49] BEI Godok Aturan Pembagian Dividen ("Indonesia Stock Exchange discuss regulation on dividend payment"), Inilah.com, 22nd of February 2013, http://pasarmodal.inilah.com/read/detail/1960834/bei-godok-aturan-pembagian-dividen#.Up9kCsTuLX4

[50] *BEI Target Aturan Dividen Selesai Tahun Ini* ("Indonesian Stock Exchange aims to finalize regulations on dividend payments this year"), RepublikaOnline, 23rd of February 2013, http://www.republika.co.id/berita/ekonomi/bisnis/13/02/23/mimu6m-bei-target-aturan-dividen-selesai-tahun-ini

[51] *Pelaku Pasar Merespons Aturan Pembagian Dividen* ("Market participants responding to regulations on dividend payments"), Indonesia Finance Today, 19th of March 2012, http://www.indonesiafinancetoday.com/read/24004/Pelaku-Pasar-Merespons-Aturan-Pembagian-Dividen

3.2. Corporate governance and ownership structure in Indonesia

Now we discuss the potential agency conflict of firms on the IDX. Claessens *et al.* (2000) show that firms in East Asia, including Indonesia, have a concentrated ownership structure, and this causes potential agency conflicts between the majority and minority shareholders instead of between the owners and managers. The report of BAPEPAM-LK[52] (The Capital Market and Institution Supervisory Agency, i.e. Indonesia's Security Exchange Commission) in 2011[53] shows that the average public ownership from 2007 to 2011 is only 25%. The government has identified this concentrated ownership structure as a matter of concern. Their concern is understandable because such concentrated ownership structure, with low shareholder protection increases the expropriation risk by the majority shareholders, which increases agency costs, and finally it impacts on the soundness of the investment environment.

Large shareholders on the IDX are mainly in the form of corporations. Mahadwarta (2004)in Mahadwarta and Ismiyanti (2008) coined the term "Internal institutional ownership" to portray Indonesia's unique ownership structure[54]. Unlike institutional investors who are usually financial firms (e.g. Agrawal and Mandelker (1990)), according to this study, the term "Institutional investors" refers to both financial and non-financial firms (but mostly non-financial firms). Mahadwarta (2004) uses the term "Internal institutional ownership" because this particular ownership type keeps their majority share of the companies, acting as insiders and controlling the managers and boards of directors. This corporate ownership type usually has a relationship with the founding family of the firms. He reports this internal institutional ownership dominates ownerships on the IDX with average holdings of 48%, during 1995 to 2002. The empirical study of Barclay *et al.* (2009) find that non-financial corporate blockholders, namely the operating corporate blockholders do indeed actively influence the firms' decisions to improve their performance. In other words they also acted as monitoring

[52] BAPEPAM-LK is the Capital Market and Non-Bank Financial Institution Supervisory Agency under the Ministry of Finance Republic of Indonesia.

[53] Study report of BAPEPAM-LK 2011 (The Capital Market and Institution Supervisory Agency), entitled: Efektivitas PP Nomor 81 Tahun 2007 dan PMK Nomor 238/PMK.03/2008 Terhadap Peningkatan Jumlah Emiten. (The effectiveness of Government Regulation No. 81 year 2007 and Ministry of Finance Regulation No. 238/PMK.03/2008 in increasing the number of listed firms and public ownership).
Report study is available publicly at:
http://www.bapepam.go.id/pasar_modal/publikasi_pm/kajian_pm/index.htm

[54] Barclay *et al.* (2009) use the term "corporate blockholder", which is a corporation (either a financial or non-financial firm) that have a substantial amount of shares in a firm.

agents. Thus, they tend to decrease the dividend payout. On the other hand, they find that the financial corporate blockholders do not influence the payout policies.

A report from BAPEPAM-LK (2011) demonstrates that these large majority shareholders greatly influenced firms' policies[55]. The presence of a large powerful shareholder might have two possible outcomes. Either this large majority shareholder helps reduce the agency conflict with its monitoring role (Agrawal & Mandelker 1990), or the presence of this powerful shareholder escalates the agency conflict between the majority and minorities due to the expropriation risk (Gugler & Yurtoglu 2003; Berzins *et al.* 2012).

The aforementioned report concludes that most of the listed firms on the IDX are controlled by large shareholders, which in turn makes the expropriation risk relatively high. Thus, agency conflict between the majority shareholder and the minority shareholders has become an important issue in our case study. Lease *et al.* (2000) argue that agency conflict also evolved through the evolution of the firm's life-cycle. In this study, we consider the severity of the agency conflict in our life-cycle variables, which will be discussed in section 4.2.2.

4. Data and Methods

4.1. Data and sample

We use the year 1995 as a starting point for our observations, taking advantage of the availability of more accurate and reliable data, due to the automated system, as well as the fact that it is the year the capital market system is legally established. Moreover, by doing so, we are also able to examine the impact of the Asian crisis in 1997-1998 and the global financial crisis in 2008-2009.

Following Fama and French (2001), we exclude highly regulated industries, such as the financials and utility industries, and we exclude firms with negative equity. The number of firms that met our requirements is different for each year due to newly listed firms appearing. After excluding financial and utility industries, firms with negative equity, incomplete financial statement data, and samples with extreme values (we clean the data by dropping the lowest and

[55] Pedersen and Thomsen (2003) argue that concentration of ownership indicates the power of shareholders to control managers which was reflected in the firm's strategy, e.g. target profit, dividend policy, capital structure, and growth rate. In line with this argument, they also mention that the majority shareholder is the one who decided the dividend policy. In the case of Indonesia, dividend policy is one of the strategic decisions decided directly by the general shareholders' meeting; therefore, the majority or the controlling shareholder will be the one that makes the decision.

highest 1% observations) from Bloomberg's database, the final number of our sample for 1995 is 132 industrial firms and this number has become 309 for 2011. Then, we use the Indonesian Stock Exchange performance summary report for dividend payment information and firms' ages and merge it into our database, together with the final financial statement data from Bloomberg. For the ownership data, we hand collect the information from the firms' annual reports. Our final sample is 2,600 firm-years.

4.2. Variable definition

4.2.1. Dependent variable

The aim of this study is to examine whether the propensity of Indonesian firms to pay dividends follow the life-cycle hypothesis. We measure the propensity to pay dividends by using a dummy variable, taking the value of one if the firms paid dividends and zero otherwise (*DDIV*). Most of the previous dividend research in Indonesia use the dividend information reported in the audited financial reports, and measure dividend payouts as dividends paid in the current year divided by earnings in the current year. We argue that this measurement is bias. In Indonesia, the Annual General Meeting of shareholders (AGM) is usually conducted at least six months after the end of the Financial Year (FY). The dividend policy for the previous year is decided at this meeting. For example, the dividend policy for FY2012 is decided in the AGM held during June 2013 using earning reported by the 31st of December 2012. Then, the dividend for FY2012 will usually be paid one or two months after the AGM and this transaction is reported at the end of FY2013 together with the dividend interim paid in FY2013, if any, which is actually part of the dividend policy for FY2013. Accordingly, for firms that only pay dividends once a year, the dividend reported in the current financial statement would actually represent the previous year's dividend policy; and if firms pay dividends more than once in a year, the reported dividend in the current financial statement would contain both the previous year's dividend policy and the current year's one, i.e. the interim dividend of the current year. We trace the dividend information from the summary of the financial reports on the Indonesian Stock Exchange's database, which reported each dividend announcement and stated whether the dividend is interim or final.

4.2.2. Life-cycle proxies

Lease *et al.* (2000)propose that the dividend life-cycle give a more comprehensive look and accommodate market imperfections in explaining the dividend policy. However, finding a life-cycle proxy accommodating Lease et al.'s framework is difficult and tricky. The existing

literature provide some measures of life-cycles, but the results are inconsistent. First we discuss the life-cycle measures in the literature.

DeAngelo et al. (2006) argue that the level of contributed or earned equity (retained earnings to total equity – *RE/TE*) show the extent to which the firm is self-financing or reliant on external capital. In other words, more mature firms would have more retained earnings and they would be more self-financing. In such situations, their ability to generate cash overtake their ability to fund profitable investment opportunities, while their investment opportunities are declining. Thus, it makes them candidates for paying dividends. Denis and Osobov (2008) and Brockman and Unlu (2011) show that a firm's life-cycle measure of DeAngelo et al. (2006) has consistent explanatory power in explaining the dividend policy in various countries. One might suspect that *RE/TE* to some degree reflects profitability because a firm cannot have high retained earnings with no substantial profitability in the previous period. However, DeAngelo *et al.* (2006) argue that two firms with identical historical earnings can have different *RE/TE* ratios because the firm with the lower *RE/TE* has sold more equity to fund its investment program, which indicate an early infusion stage of its life cycle, rather than a later stage[56]. Based on this discussion, we also use age as one of our proxies for the life-cycle.

However, Von Eije and Megginson (2008) show that a firm's age is a better proxy for the firm's life-cycle than earned equity. They do not find that *RE/TE* is able to explain the firms' propensities to pay dividends. Based on the life-cycle theory, the progress of the firms' life-cycle stage is indeed the function of time. The longer the firm continues to operate, the more mature it will be. Therefore, the firm's age also can measure the advancement of the firm's maturity in its life-cycle. Nevertheless, it is also difficult to assign a company to the mature or declining phase based on merely a single proxy, and it cannot tell us in what phase of its life-cycle a firm is actually in.

We use a novel proxy, namely the life-cycle index to capture the firms' life-cycle which incorporate the severity of the agency conflict. In the conceptual framework of Lease *et al.* (2000), the less mature firms would have higher investment opportunities, higher information asymmetry, higher transaction and floatation costs but lower agency conflict and tax than the more mature firms. We try to make a proxy that captures this concept. We discuss our index in the following.

[56] The correlation between *RE/TE* and ROA in Table A1 (appendix) does not show a strong correlation (0.13).

Dividend policy could be used as a tool for taking private benefit (Faccio *et al.* 2001) or reducing agency conflict (Jensen 1986). Following the life-cycle model, we argue that more mature firms will have a higher free cash flow as they are more profitable and have less investment opportunities. Thus, firms with a high level of free cash flow are more mature than firms with a low level of free cash flow. When free cash flow is high the agency problem between the majority and the minority is more severe because high free cash flow would become the source of the agency conflict (Jensen 1986). For this reason, we use the amount of free cash flow to capture the life-cycle stage that incorporates the extent of agency conflict severity. Mahadwarta (2010) use cash in hand and asset growth levels to divide firms' life-cycle stages in Indonesia into four groups, i.e. growth, star, maturity, and decline, and to investigate manager corruption regarding free cash flow and dividends. We do not use this approach because it assumes a firm to have a low total assets growth and low cash level in the decline stage. Instead, we use an assumption that firms that are in the highest level of the life-cycle have a significant amount of cash and will pay a generous dividend because the agency conflict is very high.

Each of the three measures discussed previously catches a different aspect of the firms' maturity, which may be complementary to each other as well. Nevertheless, although the correlations among them are significant at the 5 percent level, the coefficients of the correlation itself are small (see the correlation matrix in Table A1). It indicates that each measure capture a different aspect of the firms' life-cycles. Therefore, we combine these various aspects to capture the firms' maturity by composing a life-cycle index (*LCIndex*). Nevertheless, the advantage of composing this life-cycle index is that we could have a simple index whose values show the relative stage of development in the life-cycle and more appropriately represent the firms' relative maturity level in the Indonesian market. We discuss the construction of the index in the following paragraph.

First we divide our sample, from 1995 to 2011, into quartiles based on earned equity, firm's age, and free cash flow. We measure earned equity as retained earnings to equity (*RE/TE*), age as how many years the firm has been established (*Age*), and free cash flow as the net operating cash flow minus capital expenditure divided by total assets (*FCF/TA*). Since three of them have the same direction, the higher the value the more mature a firm is, we assign a value equal to one for firms that are in the first quartile, two for the second quartile, and so on. Then, we sum these three variables and divided by three, resulting in an index that has value ranges from 1 to 4 with a higher value indicating firms in a more mature stage of their life-cycle on the IDX.

The advantage of this index, besides capturing several dimensions of the life-cycle measures, is we could map the firms on the IDX into four groups of maturity: Firms with *LCIndex* 1 are in the least mature stage. They are less mature than firms with *LCIndex* 2 and so on. Whereas, firms with an index of 4 would be in the most mature stage on the IDX.

4.2.3. Control variables

We also include variables influencing dividend policy from the literature in our model specification. First, concerning the regulation and ownership structure of Indonesian firms where the controlling shareholder has the power to lead the Annual General Meeting (AGM) and decide the firm's strategic decisions, including any dividend policy decisions for their private benefit, we use the ownership proportion of the largest shareholder to control its effect (*Largest SH*). Following Fama and French (2001), we control the three firms characteristics i.e. profitability, investment opportunities, and size. We use Return On Asset (*ROA*), the market value of equity to its book value (*M/B*), and the market capitalization of the firm over the total market capitalization (*Size*) as the measures of profitability, investment opportunities, and firm size respectively. We expect profitability and size to have a positive relationship with the propensity to pay dividends, and be negative for investment opportunities. The literature show that debt also determine dividend policy. Jensen (1986) suggests that the use of debt in capital structures would reduce the agency problem due to creditor monitoring, so it would reduce the need to distribute the free cash flow through a dividend payment. This argument raises the issue of endogeneity as financial leverage can be a substitute of the dividend (Jensen *et al.* 1992). However, Fidrmuc and Jacob (2010) provide a compelling argument that both are not simultaneously determined by it, as firms has less flexibility to choose their capital structure relative to their payout policies. To minimize this issue, we use the lag of *Debt/TA* in the estimation. Another important determinant is cash holdings. DeAngelo et al. (2006) argue that larger cash holdings (cash to total assets, *Cash/TA*) indicates a build-up of an excess of funds, which are suitable for distribution. Following their method, we measure the cash holdings as cash divided by total assets. Recent findings show that competition influences dividend policy through the disciplining mechanism coming from the competition (Grullon & Michaely 2012). Following Grullon and Michaely (2012) we use industry competition to capture the industry competition, as measured by the Herfindahl-Hirschman index of firms' assets in an industry (*HHI Inds.*). We use the year effect dummy to control the business cycle as well as to control the impact of the economic crises in 1998 and 2008 on the propensity to pay dividends. If the declining propensity to pay dividend happens, we expect that all the dummy years will have

significant negative effects on the probability to pay dividends. We expect the impact of the declining propensity to pay dividends to be more pronounced during the crisis period (2007 and 2008). Finally, we control the unobservable industry heterogeneity by including industries' fixed effects.

The descriptive statistics of the variables are presented in Table 1.

Table 1. Descriptive statistics

	N	Mean	sd	Min	p25	p50	p75	Max
DDIV	2,600	0.534	0.499	0	0	1	1	1
RE/TE	2,600	-0.264	2.126	-23.446	-0.079	0.211	0.486	0.947
Age	2,600	25.963	15.768	1	16	24	31	109
FCF/TA	2,600	0.002	0.111	-0.674	-0.039	0.000	0.049	0.756
LCIndex	2,600	2.557	0.645	1	2	2.5	3	4
ROA	2,600	0.035	0.118	-1.262	0.003	0.031	0.074	1.490
M/B	2,600	1.768	2.446	0.125	0.571	1.018	1.992	31.209
Cash/TA	2,600	0.115	0.114	0	0.026	0.076	0.167	0.945
Size (%)	2,600	0.179	0.620	0.000	0.004	0.024	0.102	9.848
Debt/TA	2,600	0.289	0.216	0	0.097	0.270	0.455	0.809
HHI Inds.	2.600	2,600	0.235	0.182	0.06	0.122	0.17	2,600
Largest SH	2,600	0.481	0.251	0.001	0.310	0.501	0.638	0.993
Corporate	2,600	0.504	0.500	0	0.000	1.000	1.000	1.000
State	2,600	0.030	0.170	0	0	0	0	1.000
Insider	2,600	0.012	0.109	0	0	0	0	1.000
Individual	2,600	0.009	0.097	0	0	0	0	1.000

DDIV = dummy variable equals one if firm pays dividend and zero otherwise. RE/TE = retained earnings to total equity; Age = firms' age; FCF/TA = free cash flow to total assets; LCIndex = life-cycle index; ROA = return on assets; M/B = market value of equity to its book value; Size = firm's market capitalization to total market capitalization; Debt/TA = long term debt to total assets; Cash/TA = cash holding to total assets; HHI Inds. = HHI market share (by total assets) of firms in the industry; Largest SH = the percentage of shares of the largest shareholder; Corporate, State, Insider, and individual are dummy variables equal one if the controlling shareholder (ownership >50%) is corporate, state, insider, and individual respectively.

4.3. Methodology

We test the dividend life-cycle hypothesis using regression estimation. As our dependent variable is a categorical variable, which is a dummy variable taking the value of one if the firm paid a dividend and zero otherwise, we follow Von Eije and Megginson (2008) and test the life cycle hypothesis using panel probit regression with random effect. Our specifications are the following.

$$DDIV_{i,t} = \beta_0 + \beta_1 Life\ Cycle\ Measures_{i,t} + \beta_2 ROA_{i,t} + \beta_3 M/B_{i,t} + \beta_4 Cash/TA_{i,t} + \beta_5 Size_{i,t} + \beta_6 Debt/TA_{i,t-1} + \beta_7 Largest\ SH_{i,t} + \beta_8 HHI\ Inds._{k,t} + \alpha_t + \gamma_k + \varepsilon_{i,t} \quad (1)$$

$$DDIV_{i,t} = \beta_0 + \sum_{k=1}^{3} \beta_k Life\ Cycle\ Measures_{i,t} + \beta_4 ROA_{i,t} + \beta_5 M/B_{i,t} + \beta_6 Cash/TA_{i,t} + \beta_7 Size_{i,t} + \beta_8 Debt/TA_{i,t} + \beta_9 Largest\ SH_{i,t} + \beta_8 HHI\ Inds._{k,t} + \alpha + \gamma + \varepsilon_{i,t} \quad (2)$$

$$DDIV_{i,t} = \beta_0 + \beta_1 LCIndex_{i,t} + \beta_2 ROA_{i,t} + \beta_3 M/B_{i,t} + \beta_4 Cash/TA_{i,t} + \beta_5 Size_{i,t} + \beta_6 Debt/TA_{i,t-1} + \beta_7 Largest\ SH_{i,t} + \beta_8 HHI\ Inds._{k,t} + \alpha_t + \gamma_k + \varepsilon_{i,t} \quad (3)$$

Subscript *i* and *t* indicate the value of the corresponding variable of firm i at time t, and subscript k indicates industry k. Where $DDIV_{i,t}$ is a dummy variable equal to one if firm paid a dividend and zero otherwise. Life-cycle measures are retained earnings to equity ($RE/TE_{i,t}$), free cash flow to total assets (*FCF/TAi,t*), natural logarithm of firm age ($Log\ Age_{i,t}$) and our life-cycle index ($LCIndex_{i,t}$). $ROA_{i,t}$ is the return on assets; $Growth\ TA_{i,t}$ is annual growth of total assets, for growth opportunities. $Size_{i,t}$ is the firm market capitalization over total market capitalization. $Debt/TA_{i,t-1}$ is long-term debt to total assets, a proxy for financial leverage. $Largest\ SH_{i,t}$ is the share ownership of the largest shareholders (in percent); α and γ are time and dummy fixed effects respectively.

In equation 1 we estimate three measures of life cycle, *RE/TE, FCF/TA*, and *Log Age* one by one. Then, in equation 2, we estimate *RE/TE, FCF/TA,* and *log Age* simultaneously. Finally, in equation 3 we estimate only our life-cycle index (*LCIndex*).

5. Results

5.1. Univariate analysis

5.1.1. Dividend payment trend

First, we display the dividend paying firms' pattern to show the declining trend of dividend payments. Figure 1 presents the dividend paying firms' trend on the Indonesian Stock Exchange for non-financial and non-utility firms from 1995 to 2011. The number of dividend payers (*No. Payers*) shows a sharp decline in the years 1997 and 1998, which is possibly due to the financial crisis. It rebounds in 1999, and since then it has an increasing trend up to 2011, following the growing numbers of firms listed on the IDX (*No. Firms*). We can see from Figure 1 that the gap between the number of dividend payers and the number of firms is widening over the observation period. It indicates that the growth of the number of firms that pay dividend is

not as high as the growth of the number of firms. The line that shows the percentage of payers (*% payers*) gives us another clue. Despite the vast and growing number of firms, the percentage of dividend paying firms remains low, and noticeably stagnant after a sharp decline in 1998. We also compute the expected probability of paying a dividend during the observation period (*Expected % payers*). Following Fama and French (2001), we predict the probability of paying a dividend by using logistic regression as a function of the firms' fundamental characteristics *DDIV = f(ROA, M/B, Size)*. We use a base period of 1995-1997[57] to estimate the coefficients for each firm's characteristic variable. From this estimation, we use the estimated coefficient to get the expected percentage of payers each year from 1998 to 2012. The result, as in Figure 1, shows that it has a declining trend, although the slope is small. It means that the firms' characteristics are slowly changing. Whereas, the gap between the expected payers and the real percentage of firms that pay a dividend shown in Figure 1 indicates the declining propensity to pay a dividend[58]. The expected payers are always higher than the real payers. Using the dividend life-cycle framework, we propose a testable hypothesis that not many newly listed firms pay dividends while possibly not many older firms start paying dividends. In other words, this result provides the first indication that the firms' dividend policies on the IDX follow the dividend life-cycle hypothesis. In addition, Figure 2 adds another perspective to the phenomenon.

[57] We do not include the years 1998 and 1999 because of the Asian crisis which influence the number of dividend payers as displayed in Figure 1.

[58] We also use a 27 portfolio method of Fama and French (2001) to compute the expected number of dividend payers. We use the data from 1995 to 1997 as the baseline. With this method, we obtain similar results.

Figure 1. Dividend Paying Firms on the Indonesian Stock Exchange (IDX) 1995-2011.

Figure 1 describes the number of dividend payers in the period from 1995 to 2011, compared to the total number of firms on the Indonesian Stock Exchange (IDX). We excluded the financial and utility industries, and firms with negative equity.

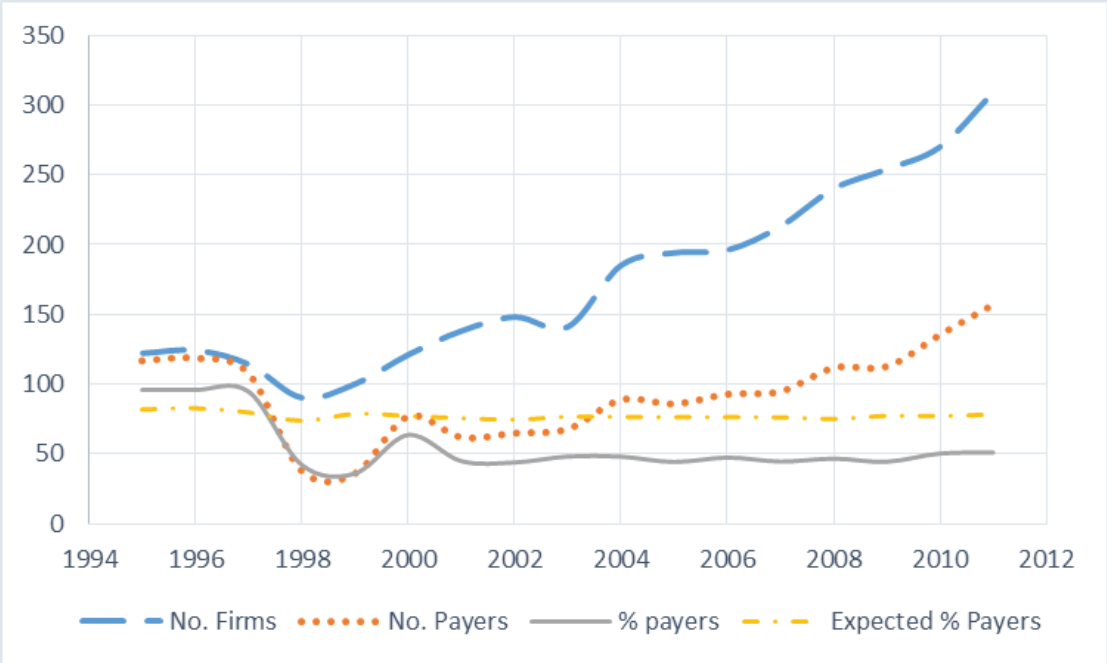
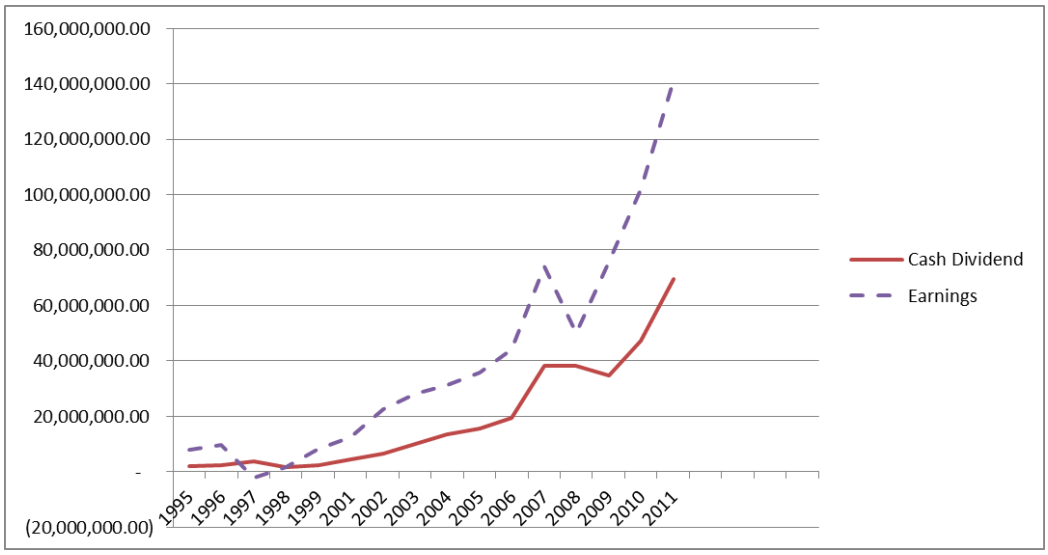


Figure 2. Cash Dividend and Earnings for IDX's Firms 1995-2011.

Figure 2 depicts the amount of cash dividend and earnings of listed firms on the Indonesian Stock Exchange (IDX) for the period from 1995 to 2011.



In Figure 2, there is an increasing trend of cash dividend amounts over the observation period. Yet, as Figure 1 suggests, the percentage of payers seems to have no significant growth, and may even be stagnant. It may also suggest that there is a concentration of dividend payments. To examine this dividend payment concentration, we calculate the Herfindahl-Hirschman Index (HHI) for the years 1995 to 2011. We present the result in Table 2. We sort a cash dividend payment by size, which is the firm's market capitalization to the overall market. Then we divide it into decile and calculate the percentage of the cash dividend amount to the total cash dividend payment for the year on each decile to obtain the HHI. Table 2 shows that dividend payments are concentrated in the largest firms group (10^{th} decile), with the highest concentration in year 2004. This result confirms that the cash dividend payments have been concentrated since 1995, and they are getting more concentrated until reaching a peak in 2004. After 2004, the concentrations gets lower but the average HHI is still higher than the HHI before the year 2000. However, we find something puzzling in Table 2. The firms in the second decile always become the second group whose dividend concentration is the highest while they are among the smallest firms on the IDX. We argue that size alone cannot be used as an indicator of firms' maturity, and therefore we need a measurement that better catches a more comprehensive aspect of the firms' life-cycle. However, it is clear that Table 2 shows a consistent result regarding the dividend concentration. It indicates that the dividend life-cycle hypothesis might be able to explain the dividend behavior on the IDX and why many firms do not pay dividends.

Tabel 2. Dividend concentration (HHI)

	Year								
Decile	1995	1996	1997	1998	1999	2000	2001	2002	2003
1	4.28	3.43	2.74	2.59	5.54	2.03	1.13	1.77	1.18
2	11.57	12.75	10.84	0.56	0.34	2.36	8.00	5.54	5.23
3	1.12	1.06	0.85	1.46	0.85	0.26	0.69	0.17	0.06
4	2.54	2.28	1.80	1.07	2.57	0.64	0.89	0.60	0.35
5	2.26	2.55	2.36	2.46	3.88	1.65	2.18	0.84	0.50
6	2.85	3.94	5.05	1.64	0.96	1.23	4.37	0.98	1.59
7	5.38	5.21	3.98	5.92	0.28	5.80	1.15	2.73	1.78
8	8.40	8.94	1.62	5.22	14.52	3.15	7.55	4.72	1.29
9	13.26	12.47	12.37	13.74	3.88	2.09	4.44	6.93	5.47
10	48.33	47.36	58.39	65.10	67.19	80.52	68.83	75.19	82.55
HHI	0.28	0.27	0.37	0.45	0.48	0.65	0.49	0.58	0.69
	Year								
Decile	2004	2005	2006	2007	2008	2009	2010	2011	Mean
1	1.31	1.78	1.52	0.85	1.59	1.49	1.32	0.93	2.09
2	4.87	10.61	8.28	42.19	10.95	15.48	17.15	11.57	10.49
3	0.06	0.14	0.12	0.10	0.17	0.36	0.25	0.19	0.47
4	0.32	0.31	0.06	0.11	0.08	0.08	0.12	0.26	0.83
5	0.35	0.19	0.33	0.14	0.93	0.43	0.33	0.28	1.27
6	1.02	2.13	0.55	0.75	0.69	0.76	0.69	0.68	1.76
7	2.23	0.92	1.57	1.15	1.61	2.48	1.41	1.32	2.64
8	1.85	2.76	2.90	1.13	2.32	3.26	4.73	7.96	4.84
9	3.71	4.40	2.94	1.73	4.69	5.50	9.39	8.52	6.80
10	84.27	76.75	81.71	51.85	76.84	70.15	64.60	68.27	68.70
HHI	0.72	0.60	0.68	0.45	0.61	0.52	0.46	0.49	

We sort cash dividend payment by size, which is the percentile of the firms' market capitalization to the overall market. Then we divided it into decile and calculated the percentage of the cash dividend amount to the total cash dividend payment of the year on each decile to obtain the HHI.

5.1.2. Life-cycle measures and propensity to pay dividend

Next, we analyze the relationship between life-cycle measures and the propensity to pay dividends. We sort *RE/TE, FCF/TA*, and *Age* by the nine ranges of the life-cycle index and reported the median of each range. The result is reported in Table 3 Panel A. *RE/TE*, *Age*, and *FCF/TA* all indicate a strong positive relationship with the life-cycle index. This result confirms that three of the life-cycle measures have the same direction. However, for the largest shareholder ownership and the life-cycle index, we can see a 'U-shape' pattern. The life-cycle index also shows a positive relationship with the percentage of dividend payers. Next, we sort the percentage of dividend payers by each of these variables in deciles as reported in Table 3 Panel B, C, and D. *RE/TE* and *Age* show a positive relationship with the percentage of dividend payers as suggested by the dividend life-cycle hypothesis. Meanwhile, *FCF/TA* shows a non-linear pattern towards the percentage of dividend payers although it still has a positive trend. To sum up our findings in Table 3, the proportion of firms paying dividends is higher in more mature firms, and it shows a positive linear pattern. However, it also reveals that there are some firms in the more mature life stage that do not pay dividends. Following the life-cycle theory, firms that do not pay dividends at the end of the life-cycle stage could be suspected of expropriation while those which are at the beginning of their life cycle, but generously pay dividends, could be thought to be tunneling. We will talk further about this in the discussion section (section 7).

Next, to see if the propensity to pay dividends is different from one firm to another, depending on each firm's characteristics, we divide the sample into two subsamples, i.e. dividend paying firms and non-dividend paying firms. In Table 4, the dividend paying firms have significantly higher *RE/TE, ROA, Size, FCF/TA, Cash/TA* and *Largest SH*, but lower *Debt/TA* than the non-dividend paying firms. The dividend paying firms are also older than non-dividend paying one. We find that *M/B* does not have a significant difference for both groups[59]. Again, the result in Table 4 indicates that Indonesian listed firms' dividend policies follow the firms' life-cycles. The results from Tables 3 and 4 may be influenced by individual and industry heterogeneity correlated with the life-cycle measures. In the next section, we will control the heterogeneity in regression analyzes.

[59] Alternatively, we also use sales growth rates and asset growth rates as growth opportunities (investment opportunities). We find there are no significant differences between dividend payers and non-dividend payers from both variables.

Table 3. Life-Cycle proxies and the proportion of firms paying a dividend

Panel A: Life-Cycle Index	1-1.25	1.25-1.75	1.75-2	2-2.25	2.25-2.5	2.5-3	3-3.25	3.25-3.5	3.5-4	
Percentage of payers	15.48	31.8	48.38	39.67	41.56	50.82	53.26	64.03	77.89	
RETE	-0.599	0.009	0.117	0.01	0.08	0.232	0.298	0.45	0.661	
FCF/TA	-0.074	-0.054	-0.05	-0.032	0	0.016	0.017	0.056	0.071	
Age	4	4	7	9.5	8	11	14	11	17	
Largest SH	50	51	46.44	38.5	43.15	46.58	47.49	49.83	90	
No. of firms	101	412	401	368	474	549	552	278	554	
Panel B: *RE/TE*	<p10	p10-p20	p20-p30	p30-p40	p40-p50	p50p-60	p60-p70	p70-p80	p80-p90	>p90
Percentage of payers	11.94	16.43	23.48	25.91	50.83	66.49	72.78	75.62	78.95	77.2
Percentage of samples	10.51	10.54	10.57	10.48	10.57	10.51	10.51	7.97	8.32	9.99
Panel C: *FCF/TA*										
Percentage of payers	51.78	47.95	41.64	34.79	55.62	49.86	49	50.14	61.92	62.38
Percentage of samples	9.89	9.89	9.89	9.89	9.89	9.89	9.89	9.89	9.89	10.95
Panel D: Age										
Percentage of payers	38.22	46.2	46	47.68	48.49	51.15	50.93	49.67	51.35	73.6
Percentage of samples	9.37	9.82	10.38	10.95	10.89	11.67	11.25	13.52	11.04	1.10

In Panel A We split the 15 years of the sample into quartiles for each of the variables, earned capital to total equity (RE/TE), free cash flow (FCF/TA), and Age. Then we assigned a value equal to 1 for the first quartile, 2 for the second, and so on for each of the variables, and we sum these values of the three variables resulting in an index that has values ranged from 1 to 4. Then we sort RE/TE, FCF/TA, Age, and the largest shareholder by the 9 range life-cycle index and report the median on each range.
In Panel B, C, and D we sorted the percentage of dividend payers by the decile of RE/TE, FCF/TA, and Age respectively.

Table 4. Dividend payers vs. Non-dividend payers

	Payers (n = 1,414)	Non-Payers (n = 1,236)	Diff.	t
LCIndex	2.64	2.35	0.29	13.67***
RE/TE	0.21	-1.01	1.217	16.05***
ROA	0.07	0.01	0.055	7.37***
Age	27.99	23.73	4.265	7.99***
FCF/TA	0.01	-0.01	0.023	5.87***
M/B	1.99	1.84	0.156	1.64
Size (%)	0.30	0.08	0.215	9.33***
Debt/TA	26.63	30.28	-3.648	-5.08***
Cash/TA	0.15	0.09	0.06	15.20***
Largest SH	0.48	0.43	0.044	5.31***

Mean comparison of dividend payers and non-dividend payers. We divided our sample into dividend payers and non-payers and calculated the mean value of each firm's characteristic variable for both dividend payers and non-payers to obtain the numbers in the table above.

5.2. Empirical results

5.2.1 *Dividend life-cycle hypothesis test*

We estimate our equation 1 - 3 using a panel random effects probit regression with industry and year fixed effects. First we estimate each of our life-cycle measures (*RE/TA, Log Age, FCF/TA,* and *LCIndex*) on the dummy dividend payment (*DDIV*) separately (equation 1) and report the results in Table 5 column 1 - 3. The results show that *RE/TE* and *log Age* have a positive coefficient and significance, both being significant at the five percent level. In column 3, we have a positive coefficient for *FCF/TA*, but the coefficient is not significant. In Table 5 column 4, we include the three life-cycle measures in the estimation (equation 2), and all of them have a positive and significant coefficient. Finally, we introduce our life-cycle index (*LCIndex*) in column 5 (equation 3). The result shows that the *LCIndex* has a significant positive coefficient as well. To ensure the accuracy of the random effect probit estimation, we perform the estimation using a different number of integration points. We compare the results in Table 5[60] with 8 and 16 integration points, and we do not find a substantial difference in the coefficients. The results are robust, and we could firmly conclude that an increase in the life-cycle measures increases the predicted probability of paying dividends. It suggests that the propensity to pay dividends of firms on the IDX tends to follow their life-cycle. The more mature the firm is, the

[60] We use 12 integration points as the default in Stata in the probit command.

higher the propensity to pay.

Using equation 3, we also show the predicted probability of paying dividends at each stage of the *LCIndex*. The prediction is presented in Figure 3. In the first stage of the *LCIndex*, the predicted probability of paying dividends is zero (no possibility of paying a dividend), then the firms start to show a small probability of paying dividends when the *LCIndex* is 1.5, and when the *LCIndex* reaches four, the predicted probability of paying dividends reaches 0.6.

The findings discussed above are also supported by the positive and significant effects of *ROA* and *Size*, indicating that the more profitable and bigger size firms, whose characteristics belong to more mature firms, have a higher propensity to pay dividends. However, investment opportunity, measured by *M/B*, has the opposite sign from that we expected. Instead of a negative relationship, we find a positive relationship between *M/B* and the propensity to pay dividends. It may suggest that they also use dividends as a signal to the market, in line with the signaling hypothesis. However, from the five specifications, only two specifications have strongly significant coefficients (p-value less than 0.05). Nevertheless, this positive relationship between investment opportunities and the propensity to pay dividends is not surprising. Denis and Osobov (2008) find similar phenomena in Germany, France, and Japan while at the same time they find their empirical findings support the dividend life-cycle in those countries. As we expect, Debt/TA has a negative and significant effect on the probability to pay dividends, and it is consistent in all specifications. This suggests that the use of debt lessens the probability of firms' paying dividends. We find *Cash/TA* has a positive and significant relationship with the probability to pay dividends. The *Cash/TA* coefficient and sign suggest that the higher the cash holding is in firms, the greater the probability they would pay a dividend. This is in line with DeAngelo *et al.* (2006) which argue that larger cash holdings indicates a build-up of excess funds, which are suitable for distribution. Another possible explanation is that when a firm is in the high growth stage, it will shift its cash into operating assets.

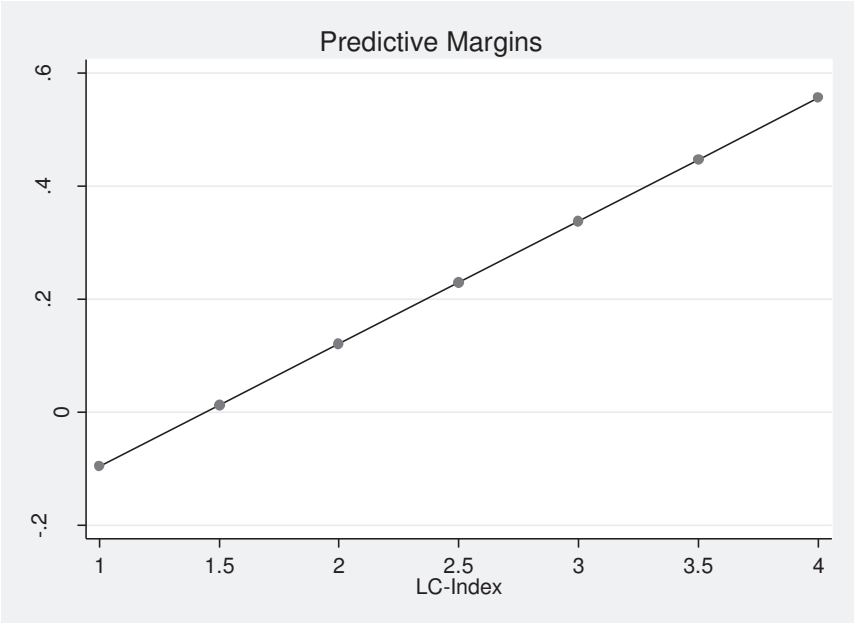
Table 5. Baseline regression. Propensity to pay a dividend and the firm's life-cycle

DDIV	(1)	(2)	(3)	(4)	(5)
RE/TE	0.171**			0.178**	
	(2.29)			(2.35)	
Log Age		0.0335**		0.0353**	
		(2.12)		(2.36)	
FCF/TA			0.749	0.741*	
			(1.63)	(1.66)	
LCIndex					0.217**
					(2.34)
ROA	2.372***	2.211***	2.081***	1.959***	2.187***
	(3.37)	(3.35)	(3.17)	(2.99)	(3.26)
M/B	0.0756***	0.0445*	0.0402	0.0461*	0.0877***
	(2.73)	(1.73)	(1.55)	(1.83)	(3.05)
Cash/TA	2.832***	3.042***	2.947***	3.082***	2.733***
	(3.70)	(3.95)	(3.79)	(4.02)	(3.52)
Size	44.88**	47.44**	53.14**	55.78**	40.84**
	(2.17)	(2.31)	(2.26)	(2.41)	(2.19)
Debt/TA	-0.0170***	-0.0199***	-0.0192***	-0.0192***	-0.0175***
	(-4.70)	(-5.14)	(-5.02)	(-5.05)	(-4.85)
Largest SH	0.390*	0.339	0.340	0.336	0.405*
	(1.68)	(1.31)	(1.31)	(1.31)	(1.76)
HHI Inds.	-1.775**	-1.642*	-1.759*	-1.698*	-1.854**
	(-2.11)	(-1.85)	(-1.94)	(-1.91)	(-2.17)
Constant	4.119***	2.657***	4.558***	3.891***	2.359***
	(5.94)	(3.24)	(6.21)	(5.23)	(3.02)
Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
AIC	2184.6	2211.1	2220.4	2219.5	2163.0
BIC	2436.4	2463.2	2472.5	2471.6	2426.5
Rho	0.594	0.614	0.635	0.615	0.564
No. of Groups	309	309	309	309	309
N	2600	2600	2600	2600	2600

*Dependent variable is DDIV = dummy variable equals one if the firm pays a dividend and zero otherwise. RE/TE = retained earnings to total equity; Log Age = natural logarithm of the firm's age; FCF/TA = free cash flow to total assets; LCIndex = life-cycle index; ROA = return on assets; M/B = market value of equity to its book value; Size = firm's market capitalization to total market capitalization; Debt/TA = long term debt to total assets; Cash/TA = cash holdings to total assets; Largest SH = the percentage of shares of the largest shareholder; HHI Inds.=HHI of total assets industry k. z statistic in parentheses. * p< 10%, **p < 5%, ***p < 1%Standard error is adjusted for clustering of firms.*

Figure 3. Propensity to Pay Dividends of each life-cycle stage of IDX's Firms.

Figure 3 shows the predicted probability of firms to pay a dividend at each stage of their life-cycle from specification (5). The life-cycle stage is based on the life-cycle index that ranges between 1 and 4, with 4 being the more mature stage.



We acknowledge that different industries might influence the dividend policies due to the industries' characteristics. We control for industries competition in all of our estimations. The results in Table 5 and 6 show a consistent result of variable *HHI Indus.* We can conclude that industry competition has a positive influence on firms' propensity to pay dividends, supporting the dividend outcome model of Grullon and Michaely (2012) that dividend policy is also an outcome of external disciplinary mechanisms. Besides, controlling for industry competition that may change throughout the observation period (e.g. due to new firms entering the market), we also use the industry dummy to control the industries' fixed effect in all specifications. To see if there are any differences among industries, we compute the marginal effect of the dummy industry coefficients from the estimation of specification 5. The result suggests that the propensity to pay dividends differ from one industry to another. We find the industries that have the biggest negative and significant coefficients are the software & services industries and the technology & hardware industries. This suggests that firms in the software and technology related industries have less probability of paying dividends than other industries because these

industries need a lot of investment in research and development, and always face abundant investment opportunities and product innovations. This is similar to the finding of Denis and Osobov (2008) for US and Canadian samples. Whereas industries that have the highest coefficient are the household & personal products industries, which indicates that firms in these industries have more probability of paying a dividend. Confirming the declining propensity to pay dividends, all estimations show that the dummy year always has a negative and significant coefficient.

We do not find consistent results that the ownership level of the largest shareholder has a positive relationship with the propensity to pay dividends. We only get two significant coefficients of ownership out of the five estimations in Table 5. There is a possibility that different ownership types might behave differently towards a dividend policy. Thus, we will examine this issue further later in the next subsection, as well as introducing the importance of the corporate ownership role into the dividend policy.

5.2.2. Ownership type and dividend propensity to pay.

In the baseline regression, we find an indication that ownership concentration has a positive relationship with the propensity to pay dividends. As mentioned before, one of IDX's characteristics is that most of the controlling shareholders are corporations. Therefore, we investigate further into the issue of this particular type of ownership compared to the other types. We define this particular ownership type as any corporation that owned the majority of the shares[61]. The literature show that such investors will take the role of the monitoring agent, thus reducing the agency conflicts between managers and owners. Therefore, paying high dividends is no longer necessary. However when the conflict is between the majority and minority shareholders, the majority shareholders often have the discretion and the incentives to extract private benefits from their control (Gugler & Yurtoglu 2003). Barclay *et al.* (2009) find that non-financial corporate investors actively influence firms' policies. In such cases, the corporate majority shareholder might need a dividend to mitigate the agency conflict between the majority and the minority shareholders. Thus, we should find a positive relationship between corporate ownership and the propensity to pay dividends. On the contrary, if the monitoring hypothesis holds, we should find that corporate ownership is negatively associated with the propensity to pay dividends.

To examine how corporate ownership influenced the propensity to pay dividends, we use two

[61] Instead of using the term "Internal institutional ownership", we use the term "Corporate ownership"

specifications in the following. Firstly we only put each ownership type into the estimation one at a time (equation 4), in which a dummy variable takes the value one if the firms are at least 50% owned by a particular type of owner, and zero otherwise. In this specification, we make the other types of ownership as the benchmark. We identify there are three other types of majority ownership in our sample of Indonesian firms, collected from the annual financial reports of each firm, which are government, family, and insider (manager or on the board of directors). Secondly, we introduce the other ownership types into the estimation and suppress the constant (thus, without a reference group), to see if each type behave differently towards the dividend policy (equation 5).

$$DDIV_{i,t} = \beta_0 + \beta_1 LCIndex + \beta_2 Ownership\ Type_{i,t} + \beta_3 ROA_{i,t} + \beta_4 M/B_{i,t} + \beta_5 Cash/TA_{i,t} + \beta_6 Size_{i,t} + \beta_7 Debt/TA_{i,t-1} + \beta_8 HHI\ Inds._{k,t} + \alpha_t + \gamma_k + \varepsilon_{i,t} \quad (4)$$

$$DDIV_{i,t} = \beta_1 LCIndex_{i,t} + \sum_{k=2}^{3} \beta_k Ownership\ Type_{i,t} + \beta_5 ROA_{i,t} + \beta_6 M/B_{i,t} + \beta_7 Cash/TA_{i,t} + \beta_8 Size_{i,t} + \beta_9 Debt/TA_{i,t} + \beta_{10} HHI\ Inds._{k,t} + \alpha + \gamma + \varepsilon_{i,t} \quad (5)$$

Table 6 shows that corporate ownership always has a significant and positive coefficient. It means that when the share of corporate ownership is more than 50%, the propensity to pay dividends is higher than the other ownership types. When we introduce the other types of ownership, i.e. state, individual/family, and insider (managerial and board of directors), we find that corporate ownership has a positive and significant coefficient at the 5% level, and we also find a positive and significant coefficient of government, but only at the 10% level. We also run the estimation using other measures of the life-cycle as we have done before, and we find the result for corporate ownership is robust, but not for government ownership. We may conclude that the most influential type of owners for the propensity to pay dividends are the corporate owners, and they use dividends as the tool to reduce the agency conflict, sending a signal that they would not expropriate the minority shareholders.

Table 6.Propensity to pay dividends and ownership type

DDIV	(6)	(7)	(8)	(9)	(10)
LCIndex	0.220**	0.212**	0.213**	0.194**	0.334***
	(2.37)	(2.29)	(2.33)	(2.13)	(4.17)
Corporate	0.267**				0.333***
	(2.00)				(3.14)
State		0.648			0.590
		(0.95)			(1.29)
Insider			0.219		0.123
			(0.77)		(0.33)
Individual				0.510*	0.329
				(1.76)	(0.54)
ROA	1.958***	1.884***	1.982***	1.979***	1.795***
	(2.98)	(2.93)	(3.01)	(3.07)	(3.76)
M/B	0.0463*	0.0458*	0.0446*	0.0421*	0.0500**
	(1.82)	(1.91)	(1.80)	(1.71)	(2.37)
Cash/TA	3.053***	2.956***	2.811***	2.950***	3.129***
	(3.96)	(3.82)	(3.55)	(3.81)	(7.08)
Size	54.55**	52.58**	55.93**	56.08**	63.73***
	(2.38)	(2.35)	(2.47)	(2.44)	(3.32)
Debt/TA	-0.0193***	-0.0189***	-0.0192***	-0.0195***	-0.0166***
	(-5.04)	(-4.96)	(-5.17)	(-5.26)	(-5.67)
HHI Inds.	-1.671*	-1.528*	-1.809**	-1.573*	1.126*
	(-1.86)	(-1.71)	(-2.00)	(-1.83)	(1.88)
Constant	3.885***	4.214***	4.060***	3.990***	
	(5.21)	(5.12)	(5.55)	(5.54)	
Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
AIC	2215.4	2165.5	2219.0	2281.5	2156.7
BIC	2467.6	2416.5	2470.9	2534.7	2418.3
Rho	0.615	0.615	0.613	0.617	0.591
No. of Groups	309	309	309	309	309
N	2600	2600	2600	2600	2600

*Dependent variable is DDIV = dummy variable equals one if the firm pays a dividend and zero otherwise. LCIndex = life-cycle index; Corporate, State, Insider, and individual are dummy variables equal to one if the controlling shareholder (ownership >50%) is corporate, state, insider, and individual respectively; ROA = return on assets; M/B = market value of equity to its book value; Size = firm's market capitalization to total market capitalization; Cash/TA = cash holdings to total assets; Debt/TA = long term debts to total assets; HHI Inds.=HHI of total assets industry k. z statistic in parentheses. * p< 10%, **p < 5%, ***p < 1%Standard error is adjusted for clustering of firms.*

6. Robustness check

We perform several robustness checks both in the estimation and our index[62]. We perform the probit estimation using a different number of integration points, and the results are robust. We replace *RE/TE* with *RE/TA* in the life-cycle index and repeat all the estimations above. We find similar results. Following DeAngelo *et al.* (2006), we also consider the sticky dividend phenomena by introducing the lag dummy dividend on the explanatory variables side. The results hold, and it means that the lagged dividend payment does not take all of the effects of the other variables. We run all estimations without firms that have negative profitability (*ROA*), and our results remain steady. We run all estimations with asset growth rate as the investment opportunities measure, instead of *M/B* and we find similar results. Regarding the issue of a potential endogenous regressor, *Debt/TA*, we perform an instrumental variable probit estimation. Using specification 5, we instrument *Debt/TA* with its previous year's industry average and fixed assets. Alternatively, we perform a sub-sample probit estimation based on high and low *Debt/TA* firms, defined as firms with *Debt/TA* above and below the sample median. The results for all of these alternative specifications are very similar to those reported in Tables 5 and 6, which still support our findings.

7. Discussion

As a civil-law country, Indonesia has weak investor protection. However, Indonesia has a relatively high economic growth and to further expand this high growth rate, Indonesia needs to provide better investor protection. From the government's point of view, the main reason for the mandatory dividend regulation is to provide better governance and investor protection particularly towards the minority shareholders. Yet, most of the listed firms on the IDX are owned by corporate investors that actively influence their firms' policies. Such a situation may indicate that investors are facing a high expropriation risk. More importantly, these large shareholders usually also own the related upstream or downstream industries through pyramidal ownership which exacerbates the risks of expropriation. Understandably, the government is concerned that low dividend payouts will demotivate investment and cause lower numbers of trading transactions. Ultimately, this will worsen the investment climate, which in turn slows down economic growth. Nevertheless, there is an empirical finding from a country that has been

[62] The results are not reported but can be provided on request by the authors.

applying mandatory dividend rules, which find that the mandatory dividend does not have a negative effect on growth.

Martins and Novaes (2012) look at the investment and dividend decisions of non-financial listed firms in Brazil from 2005-2009 to evaluate the mandatory dividend rule[63], and find that the average dividend yield is high, despite the fact that some firms are using loopholes to avoid paying dividends. Their findings suggest that the mandatory dividend rule is indeed able to increase payout ratios among the profitable firms in Brazil. It also suggests that the rule is able protect the cash-flow rights of the minority shareholders, as it is rare for firms to not pay dividends for more than two years. Furthermore, they also find that the mandatory dividend rule does not slow down the investment plans of the firms, even during times of crisis.

At the moment, the rules regarding dividends in Indonesia are set in the regulation for listed firms. The principal regulation about listed firms in Indonesia is the Corporate Act no. 40 year 2007. A clause in this act states that firms should pay dividends when they have a positive net income, and they have put aside some retained earnings. However, the clause adds: "except when the general shareholders meeting decides otherwise". This creates a loophole for firms that are owned by powerful majority shareholders or owned by individual/family owners, as is frequently the case in Indonesia. They will be the ones that make the decisions about whether or not the firm will pay dividends. Nevertheless, unlike countries with common law legal origins, even if the firm has a positive net income but does not pay a dividend, the investors cannot go to the court to ask for a court order to make the firm pay their cash flow out as a dividend. In Indonesia, whose legal origins are in civil law, judges have a more limited role to apply the law to the case in hand because everything must refer to the codes and statues. Furthermore, law enforcement in Indonesia in this particular case is weaker than in Brazil. Although about a quarter of the listed firms in Indonesia never pay dividends throughout the observation period, there is no legal or even administrative sanction imposed on these firms by the Security Exchange Commission. To make things worse, most of the public investors in Indonesia are not well aware of the rules and regulations that can protect them from expropriation.

[63] The mandatory dividend has been effectively applied in Brazil since 1976. Before 2001, firms have to pay 25% from their reported annual profit. Noncompliance with the rule or if the Brazilian Security Exchange Commission (CVM) discover firms trying to bypass the dividend, they would be punishable by fines and the CVM may force the firm to pay the minimum dividend. However, the rule has changed since 2001, and dividend payouts now may be lower than 25% as long as all shareholders agree in the AGM.

From the firms' points of view, the government should not issue a mandatory dividend regulation since their dividend policies are already stated in their firms' charters, and it is decided by the AGM. For the firms, retained earnings are the cheapest source of capital, since there are no costs associated with debt or of new share issues. Our findings show that firms in Indonesia follow the life-cycle hypothesis. It means that firms have specific conditions at any given stage and adjust their dividend policies accordingly to maximize the firms' value. Hence, firms that do not pay dividends are not necessarily expropriating minority shareholders. We might suspect expropriation if the firms are in the most mature stage in our life-cycle index and have net positive incomes but do not pay dividend. In Table 3, we find that some firms do not pay dividends in the later stages of the life-cycle. To explain why these firms do not pay dividends, we will go further into the details.

We find that out of 309 firms, there are 22 firms which, when they became the most mature in the life-cycle (*LCIndex* > 3.5) among the firms on the IDX, which should make them the strongest candidates to pay dividends, do not pay or omit dividends. We provide the information of these firms in Table A3. The column entitled "Freq. not paying" is the frequency of firms which do not pay/omit dividends since they reach *LCIndex* higher than 3.5. On average these firms only omit a dividend 1.6 times after they enter this stage that supposedly pays dividends. This suggests that there might be another reason for not paying dividends, other than expropriation. Out of these 22 firms, we find three of them have a negative net income that justify not paying dividends, 17 firms omit to pay only once, while the other two are not paying/omitting dividends more frequently, although they have positive net incomes. In fact these two firms, NIPS and RDTX, actually have never recently paid dividend. NIPS has stopped paying dividends in 1997 while RDTX has stopped paying its dividend in 2002. This might imply that there are only a few mature firms that do not have an obvious reason for not paying a dividend.

Now, we look at the firms that have never paid dividends. From the 309 non-financial firms in our sample, 75 never pay a dividend during our observation period. The characteristics of firms that never pay dividends versus the firms that always pay are presented in Table A4. Similar to what Table 4 shows, these firms are less profitable, younger, and smaller than firms that always pay dividends. All the mean differences are statistically significant. It indicates that these firms are in the early infusion stage of their life-cycle rather than the later stages. From 19 industries in our sample, the firms that never pay dividends are distributed among 17 industries. There are only two industries in which firms have always paid dividends, which are the automobile &

components and the household & personal products industries. In line with what we find in Table A2, these two industries have the highest marginal effects among the others.

Ownership concentration can be the substitute for internal corporate governance in countries with weak shareholder protection. However, at the same time the majority shareholders could easily take private benefits i.e. expropriation. Our findings show that, on average, firms with corporate ownership have a higher propensity to pay dividends. This indicates that when the majority shareholder is a corporation, they tend to use their dividend policy to mitigate the agency conflict. Therefore, in the context of dividend payouts, corporate ownership is not necessarily bad for corporate governance, to a certain extent. We can also argue that they, as the insiders of the firms, who have the most take on the firm, will design the dividend policy in such a way that it will maximize the firm's value. Hence, applying mandatory dividends could be redundant.

The declining dividend could be due to share repurchasing as in the study of Von Eije and Megginson (2008). We also attempt to collect information on share repurchasing, but the number of observations is relatively small. For instance, before the change in the share repurchasing regulation in 2007, there has been only about 30 share repurchase transactions since 2000. Most of the firms that frequently buy back their shares are big firms, their *RE/TE* always being above the median and always positive. Nevertheless, they pay dividends on a regular basis. For instance BLTA, HMSP, and TLKM, who repurchase most frequently, compared to other firms during 2000-2007, almost never skip paying a dividend. This might indicate that repurchasing is not a substitute for a cash dividend payment with agency problem motives, but to increase the stock price when it is undervalued and to increase the earnings per share.

If the government would like to design a mandatory dividend regulation, we recommend the following. First, the government should address the loophole in the clause about dividends in the Corporate Act. If the AGM of the firm decides not to pay a dividend, the firm should disclose the reason along with their audited financial report to the Security Exchange Commission to be examined to see if the arguments, along with the supporting evidence are reasonable. Second, the government should equip the Security Exchange Commission with the authority to enforce the law by imposing sanctions for noncompliant behaviour. Third, the mandatory dividend regulation should look at free cash flow, retained earnings proportion and firm age, rather than simply looking at the net income as the requirement for paying a dividend.

Hence, the importance of applying the idea of the life-cycle index, such as the one that we used here is vital. We are aware that our life-cycle index cannot be fully used as guidance to decide if firms are in the mature stage or in the early stage. However, the authority may use the results as guidance to identify which firms should be paying a mandatory dividend, especially if they are identified as the most mature firms. Those firms that have already been identified as the most mature firms in this study could be the subject of mandatory dividends, as firms that are already in the last life-cycle stage in this study (e.g. the *LCIndex* >3.5), will not go back to the early infusion stage of the life-cycle.

8. Summary and Conclusion

This study explains the recent concern of the IDX as to why many firms have not paid dividends. Even though the number of dividend payers is actually increasing, the percentage of firms that pay a dividend is relatively stagnant, even though the number of firms listed on the IDX is growing, indicating that many firms do not pay dividends. However, we find that the amount of the dividend paid is increasing, and this indicates a dividend concentration that is similar to what happens in other countries. As shown in our results, we argue that the reason is due to the declining propensity to pay and the changes in the firms' characteristics.

Overall, the dividend policy of firms on the IDX is mostly consistent with the dividend life-cycle hypothesis, and this might explain why some firms do not pay dividends. Earned or contributed equity, firms' age, free cash flow, and the life-cycle index that captures the firms' life-cycle or maturity have significant explanatory powers on the probability of paying a dividend. Our life-cycle proxy, namely the life-cycle index, captures several aspects of firms' maturity, i.e. maturity that is captured by earned and contributed capital of DeAngelo *et al.* (2006) and firms' age, as well as considering agency conflict severity on each stage of the life-cycle. Nevertheless, we find that firms that are controlled by corporate shareholders use dividends to reduce the severity of agency conflict with the minority shareholders. This confirms that agency conflict still plays an important role in explaining the firms' dividend policy in Indonesia.

Our results make an important contribution to the dividend policy literature in Indonesia and corporate governance regulations as we provide relatively new evidence in a broader account using the dividend life-cycle framework. As (Lease *et al.* (2000)) suggested, investment opportunities, agency conflict, asymmetric information, and shareholders' tax of a firm, i.e. the market imperfections, follow its life-cycle, and these factors shape the optimal dividend policy

of firms. It means that the dividend policy is indeed influenced by firms' characteristics and market imperfections that change according to its life-cycle. Firms cannot be forced to pay dividends with a one-policy-for-all regulation. Therefore, regulation of dividend payments, if any, should be flexible, taking into consideration at which stage the firm is. If the regulation forces firms in their growth stage to pay dividends, it will incur another agency cost due to suboptimal investment, and it will raise more costs of capital as they are forced to take more external financing while the information asymmetry and floatation costs are still high, and finally it will harm the shareholders themselves. On the other hand, firms in the more mature stage could expropriate minority shareholders and increase the agency conflict if they pay no or fewer dividends. The dividend regulation, therefore, should address the issue for those who are at the stage of paying dividends but do not do so. Thus, if the regulator finally decides to apply the mandatory dividend rule, they should have an indicator to identify the firms' life-cycle. The results from our life-cycle index that we composed in this study could give a hint that we cannot merely rely on the positive earnings reported by the firms to require them to pay dividends. One should carefully look at firms' retained earnings accumulations, free cash flows, and their age.

Appendix

Table A1. Correlation matrix

Variables		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	DDIV	1														
2	RE/TE	0.0044	1													
3	Age	0.0648*	0.118*	1												
4	FCF/TA	0.261*	0.293*	0.483*	1											
5	LCIndex	0.138*	0.0873*	0.154*	0.138*	1										
6	ROA	-0.235*	0.0208	0.0827*	-0.201*	0.139*	1									
7	M/B	0.118*	0.0101	0.250*	0.139*	0.119*	0.0615*	1								
8	Cash/TA	0.0637*	0.0464*	0.105*	0.0124	0.0667*	0.181*	0.0295	1							
9	Size (%)	-0.184*	-0.00946	-0.200*	-0.201*	-0.142*	-0.0112	-0.255*	0.0494*	1						
10	Debt/TA	0.0598*	0.110*	0.0778*	0.0557*	0.0397*	0.0950*	0.0298	0.0480*	-0.0625*	1					
11	Largest SH	0.0444*	0.0751*	0.0610*	0.0499*	0.0334	0.107*	0.0142	0.0230	-0.0316	0.784*	1				
12	Corporate	0.0608*	0.0805*	0.0440*	0.0142	0.0278	0.0879*	0.0602*	0.0675*	-0.0267	0.673*	0.822*	1			
13	State	0.0604*	0.0671*	0.126*	0.0131	0.0436*	0.0411*	0.125*	0.282*	-0.0903*	0.124*	-0.154*	-0.0511*	1		
14	Insider	0.0330	0.0148	0.0465*	0.0817*	0.0151	0.00857	0.0487*	0.0152	-0.0448*	0.0860*	-0.0384*	-0.0155	0.0385*	1	
15	Individual	0.0255	0.0239	0.0201	0.0115	0.00631	0.0195	-0.00145	-0.00412	-0.0233	0.113*	-0.0201	-0.00656	-0.0175	0.291*	1

*DDIV = dummy variable equals one if the firm pays a dividend and zero otherwise. RE/TE = retained earnings to total equity; Age = firm's age; FCF/TA = free cash flow to total assets; LCIndex = life-cycle index; ROA = return on assets; M/B = market value of equity to its book value; Size = firm's market capitalization to total market capitalization; Debt/TA = long term debts to total assets; Cash/TA = cash holdings to total assets; Largest SH = the percentage of shares of the largest shareholder; Corporate, State, Insider, and individual are dummy variables equal one if the controlling shareholder (ownership >50%) is institution, state, insider, and individual respectively. *p<0.05.*

Table A2. Marginal effect of the industry fixed effects

no	Industry	Margin dy/dx
1	Automobiles & Components (reference dummy)	2.819***
2	Capital Goods	-0.423
3	Commercial & Professional Services	-0.157
4	Consumer Durables & Apparel	-0.757*
5	Consumer Services	-0.851*
6	Energy	-0.618
7	Food & Staples Retailing	-0.708
8	Food, Beverages & Tobacco	-0.486
9	Health Care Equipment & Services	-1.558
10	Household & Personal Products	8.225***
11	Materials	-0.909**
12	Media	-0.979
13	Pharmaceuticals, Biotechnology	-0.463
14	Real Estate	-1.234***
15	Retailing	-0.411
16	Software & Services	-2.687***
17	Technology Hardware & Equipment	-2.362***
18	Telecommunications Services	-0.696
19	Transportation	-0.182

* < 10%, ** < 5%, *** < 1%

We compute the marginal effect of industry dummies from specification 5. The reference dummy is the Automobile & Component Industry. Standard error is computed using the delta method.

Table A3. Mature Firms (LCIndex>3.5) that do not pay a dividend

Company Ticker	Freq. not paying	ROA<0
ALMI	1 out of 1	0
BRAM	1 out of 7	0
DLTA	1 out of 9	0
GJTL	1 out of 1	0
INDR	2 out of 2	0
INDS	1 out of 2	0
INTA	1 out of 1	0
JPRS	2 out of 2	0
KKGI	3 out of 3	3
LPIN	1 out of 1	0
NIPS	5 out of 5	1
PBRX	1 out of 1	0
PRAS	2 out of 2	1
PTRO	1 out of 3	0
PUDP	1 out of 1	0
RDTX	4 out of 4	0
RIGS	1 out of 2	0
RMBA	1 out of 1	0
SOBI	2 out of 2	0
TBMS	1 out of 1	0
TRST	1 out of 6	0
UNTR	1 out of 1	0

Table A4. Dividend payers vs. Non-dividend payers

	Always (n = 373)	Never (n = 335)	Diff.	t
RE/TE	0.42	-1.03	1.45	10.24***
Age	34.02	19.48	14.54	7.36***
FCF/TA	0.05	-0.03	0.08	9.19***
LCIndex	2.80	2.13	0.67	14.82***
ROA	0.11	-0.01	0.10	11.97***
M/B	2.44	2.19	0.25	0.98
Cash/TA	0.16	0.07	0.09	10.89***
Size (%)	0.40	0.03	0.37	5.71***
Debt/TA	18.43	22.98	-4.55	-3.29***
Largest SH	0.52	0.44	0.08	4.65***

Mean comparison of firms that always pay a dividend, and firms that never pay. We calculated the mean value of each firm's characteristic variable for both groups to obtain the numbers in the table above. Where: DDIV = dummy variable equals one if the firm pays a dividend and zero otherwise. RE/TE = retained earnings to total equity; Age = firm's age; FCF/TA = free cash flow to total assets; LCIndex = life-cycle index; ROA = return on assets; M/B = market value of equity to its book value; Size = firm's market capitalization to total market capitalization; Debt/TA = long term debt to total assets; Cash/TA = cash holding to total assets; Largest SH = the percentage of shares of the largest shareholder. p< 10%, **p < 5%, p*** < 1%.*

General Conclusion and Concluding Remarks

The empirical investigation conducted in this dissertation highlight some important results on the behavior of banking firms' dividend policies. In Chapter 1, we examine the role of shareholder and creditor protections on bank dividend policies, to determine whether or not bank managers consider these two external factors in balancing the interest of their stakeholder in determining their dividend payouts. The empirical results are based on a world-wide sample. We find that banks' managers use dividends as a substitute of weak shareholder and creditor protections. While studies in non-financial firms find that agency problem of debt plays a more important role in determining the dividend payout policies than agency problem of equity, we show that in banking firms agency conflict of equity play a more decisive role. We argue that special banks' characteristics might explain this different finding, especially the characteristics of banks' creditors. Firstly, unlike creditors of non-financial firms, a big part of banks' creditors are mainly small depositors who, individually, have few incentives for monitoring managers. Moreover, most of these creditors are insured by deposit insurance system which discourages them to do the monitoring. Secondly, these depositors place money at standard contract terms featuring few or no indentures or specific covenants such as in firms' loan agreements. Thirdly, bank debtholders generally grant short-term secured funding to banks through loan agreements such as repurchase (repo) contracts, which may also not necessarily impose dividend restrictions. Further investigations show that stricter capital regulation, well-functioning capital market, higher disclosure requirements, and competition can reduce expropriation of creditors when their legal rights are weak.

The main finding of Chapter 2 shows that asymmetric information plays significant role in shaping banks' dividend payouts both in dispersed and concentrated ownership structure. We find that banks with either a concentrated or a dispersed ownership structure have lower payout ratios when they have higher degrees of opacity. When banks have higher degree of opacity, and where extraction of private benefit might be therefore more difficult to detect, the insiders (either managers or majority shareholders) decrease dividends to potentially increase the amount of free cash flow they can divert for their private consumption. Our results therefore support the hypothesis of an entrenchment behavior of insiders, independently of the nature of the conflict of interest, be it either between managers/shareholders or majority

shareholders/minority shareholders. The important implication of the finding is that asymmetric information should be considered when looking at banks' dividend policy. Further investigations show that shareholder protection helps to constrain the entrenchment behavior of majority shareholder but not the one of managers. However, we find that stronger supervisory regimes where regulatory authorities do on-site examinations in order to make an overall assessment of banks, contribute to moderate the entrenchment behavior of both majority shareholders and managers.

The empirical analysis of Chapter 3 shows that the dividend policies of firms in the Indonesian capital market are mostly consistent with the dividend life-cycle hypothesis, and this might provide an explanation why some firms, although profitable, have not paid dividends. Nevertheless, further investigations show that firms that are controlled by corporate shareholders use dividends to reduce the severity of agency conflict with minority shareholders. Therefore, a regulation on dividend payments, if any, should be flexible, taking into consideration at which stage the firm is. If the regulation forces firms in their growth stage to pay dividends, it will incur another agency cost due to suboptimal investment, and it will raise higher costs of capital as they are forced to take more external financing while the information asymmetry and floatation costs are still high, and finally it will harm shareholders themselves. On the other hand, firms in the more mature stage could expropriate minority shareholders and increase the agency conflict if they pay no or fewer dividends. The dividend regulation should therefore address this issue for those who are at the stage of paying dividends but do not do so.

The findings of this dissertation have several policy implications. Banks use dividend to manage agency problems either between shareholder-managers, majority-minority, or shareholders-creditors. A stronger pressure exerted by shareholders on dividend decisions of managers, relative to the one of debtholders, could be viewed as harmful for banks as the interests of shareholders, unlike those of debtholders, are not generally aligned with the preferences of regulators and deposit insurers. Shareholders, particularly in countries with weak shareholder rights, prefer earnings to be distributed as dividends, even if it reduces banks' ability to generate capital internally with a potential transfer of default risk to creditors and the deposit insurer. However, further findings show that undercapitalized banks do not appear to face pressures from shareholders to use dividends as a signalling mechanism. This stronger influence of shareholders on banks' dividend policy might not pose a substantial risk for banks' financial health from a prudential standpoint, and thus mitigate the need to redress this balance with further regulatory intervention. However, the level of information asymmetry in a bank should

be one of the main concern as managers or insiders tend to pay lower dividend when the asymmetric information is high, indicating entrenchment behavior and expropriation.

Our results highlight some potential adverse effects of the regulation suggested by the Basel Committee on Banking Supervision (BCBS, 2011) regarding the dividend policy of banks. The reform of Basel 3 suggests imposing restrictions on dividends for banks that do not satisfy regulatory solvency requirements. For instance, Basel III recommends bank to pay out maximum only 20% of its earning if bank's common equity tier 1 ratio is between 5.125% – 5.75% while a bank can pay 100% of its earning as dividend if its tier 1 ratio is greater than 8%. When a bank does not have positive earnings and has a Common Equity Tier 1 ratio less than 7%, Basel III restricts such a bank from making profit distributions. However, our findings suggest that such restrictions might have an unintended impact by amplifying the entrenchment behavior of banks with high degrees of opacity. If regulators want to allow signaling and agency mechanisms to function, this requires lessening the information asymmetry by doing on-site examinations and imposing more transparency and strict information disclosures. Nevertheless, investor protections, well-functioning financial markets, and market competition are also necessary to protect minority shareholders and creditors from expropriation.

In the other hand, the findings from Chapter 3 also have very important implication on dividend regulation, especially in emerging market countries with weak shareholder rights. If the regulator finally decides to apply the mandatory dividend rule, they should have an indicator to identify the firms' life-cycle. One cannot merely rely on the positive earnings reported by firms to require them to pay dividends. One should carefully look at firms' retained earnings accumulations, free cash flows, and their age. These findings imply that firms cannot be forced to pay dividends with a one-policy-for-all regulation. Moreover, we show that banks dividend policies are different from that of non-financial firms in some extents. Thus, regulator should also consider this industrial difference in formulating the regulation. Alternatively, facilitating a well-functioning capital markets, supporting competition in the market, and improving disclosure requirements and law enforcement will also improve the corporate governance, thus attracting investors to invest in emerging markets.

We have tried to consider all stakeholders that might influence the dividend payouts, i.e. shareholders, creditors, and regulators, as well as other external governance mechanisms. However, we have not explored more about the presence of well-informed depositors. Our study only considers depositors as a whole. Small depositors, who contribute to a bigger portion

of banks' depositors, might not have willingness to monitor bank's dividend policies. However, well-informed depositors can be another significant stakeholder that might influence banks' dividend policies. The study of Forti and Schiozer (2015) has made an attempt to consider the relevance of depositors on dividend policy. They particularly consider the influence of institutional depositors (investment fund, pension fund, and insurance). These institutional depositors are assumed to be well-informed depositors and sensitive to bank's dividend payouts. They find that these institutional depositors positively associated with the dividend payouts. Future research might want to consider another type of depositors, for instance individuals or foundations who have deposits above the guaranteed amount. They might see dividends as an importance signal to assess bank's solvency. However, identifying these depositors is a daunting task, thus a special effort is needed and the topic itself could be another new study.

One of the variables that we have not discussed comprehensively in this dissertation is the influence of bank risk on the relationship between asymmetric information and bank dividends. Indeed, our focus is on how ownership structure and bank opacity shape banks dividend payouts, not in the relationship of risk and dividend payouts. However, it turns out that bank default risk has a consistently positive association with bank dividend payouts. This result is the opposite of what Onali (2014) found. This conflicting results might be due to a missing channel between risk and dividends. While Onali (2014) only considers the influence of bank risk on dividends, future research could explore more about how bank risk interacts with the degree of asymmetric information and ownership structure and shapes the dividend payouts.

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Abstract

This dissertation aims first to investigate whether banks, which have unique characteristics, use dividends to reduce the agency conflicts between their different stakeholders. Another objective is to investigate if the implementation of a regulation of dividend policy is necessary to oblige firms to pay dividends for good governance purposes. In Chapter 1, we examine if bank managers use dividends to reduce agency cost of equity (managers vs. shareholders) and agency cost of debt (shareholders vs. creditors). We show that bank managers use dividends as substitute to weak legal protection and strike a balance in their dividend policy with however a more decisive role played by the agency cost of equity than the one of debt. Chapter 2 further explores if the degree of ownership concentration and the level of asymmetric information (opacity) faced by outsiders influence banks' dividend payouts. In either concentrated or dispersed ownership structure insiders (managers or majority shareholders) pay lower dividends when the degree of opacity is high. In line with the entrenchment behavior for banks, insiders extract higher levels of private benefits when it might be more difficult to detect such opportunistic behavior. Higher level of shareholder protection and stronger supervisory regimes help to constrain such behavior. These findings have critical policy implications for the implementation of Basel 3 with restrictions on dividend payouts that might reinforce this entrenchment behavior. In the Chapter 3, we investigate if the implementation of a regulation to oblige firms to pay dividends for better governance is desirable. We consider the case of Indonesia, where the regulator plans to implement a mandatory regulation on dividends in a context of declining dividend payments and weak shareholder rights. The findings recommend that firms should only be required to pay dividends when they reach a certain development stage, and action should only be taken against those firms which do not pay dividends, although they should be able to. Overall, dividend policies should not be regulated by one-policy-for-all regulation.

Keywords: Bank dividend payouts, agency conflicts, shareholder and creditor rights, opacity, ownership concentration.

Résumé

L'objectif de cette thèse est d'analyser l'existence de spécificités dans l'utilisation par les banques de la politique de dividende comme moyen de résolution des conflits d'intérêts. Il s'agit également de s'interroger sur l'opportunité d'une réglementation visant à imposer aux firmes le versement de dividendes, dans une perspective d'amélioration de la qualité de la gouvernance. Le premier chapitre analyse l'influence de deux conflits majeurs, dirigeants vs actionnaires et actionnaires vs créanciers. Il montre que les banques prennent en compte les deux types de conflits, la résolution des conflits entre actionnaires et dirigeants revêtant toutefois une importance prédominante. Les banques utilisent les dividendes comme un substitut à de faibles degrés de protection des droits des actionnaires et des créanciers. Le second chapitre explore ces conflits d'intérêt plus avant en analysant l'impact de la concentration de l'actionnariat et du degré d'opacité des banques. Que l'actionnariat soit dispersé ou concentré, un plus fort degré d'opacité favorise les comportements d'expropriation par les insiders (dirigeants ou actionnaires majoritaire) et conduit à des dividendes plus faibles. Un environnement institutionnel plus protecteur des droits des actionnaires ou un régime de supervision strict permettent de limiter l'expropriation. Une réglementation limitant le versement de dividendes, telle que définit dans Bâle III, pourraient renforcer de tels phénomènes. Le dernier chapitre s'interroge sur l'opportunité d'une réglementation de la politique des dividendes et s'intéresse au cas de l'Indonésie caractérisée un faible taux de versement et un faible degré de protection des actionnaires. En cohérence avec la théorie du cycle de vie, une telle réglementation devrait tenir compte du stade de développement de la firme et contraindre uniquement les firmes ayant atteint un stade de maturité, une réglementation uniforme de la politique de dividende n'étant donc pas souhaitable.

Mots-clés : politique de dividende des banques, conflits d'intérêt, protection des actionnaires et des créditeurs, opacité, concentration de l'actionnariat.