DOI: 10.1111/fmii.12183

ORIGINAL ARTICLE

FINANCIAL MARKETS, INSTITUTIONS & INSTRUMENTS NEW YORK UNIVERSITY SALOMON CENTER WILEY

Bank dividend payout policy and debt seniority: Evidence from US Banks

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Abstract

Bank depositors and creditors are expected to play an important role in banks' dividend policy since they can either discipline or incentivise managers to pay larger dividends. We provide evidence suggesting that depositors are more influential than subordinated debtholders in disciplining banks facing extreme solvency situations from wealth expropriation, which is consistent with the *monitoring hypothesis*. The results for solvent banks show that deposits and subordinated debt explain larger dividends, suggesting that signalling incentives drive these cash payments. Diving deeper into our groups of banks, we observe that the *risk-shifting hypothesis* becomes more nuanced as listed banks exercise wealth expropriation after the crisis through the uninsured deposits channel. Our results provide significant support for major dividend theories, unravelling the debt channels through which these theories may hold.

KEYWORDS
Banks, Dividends, Depositors, Subordinated debt, Market discipline, Financial crisis

JEL CLASSIFICATION
G21, G28, G35

1 INTRODUCTION

Bank dividend policy has been a subject of regulatory scrutiny, with both the Basel Committee on Banking Supervision (BCBS, 2011) and the Federal Reserve Board (FRB, 2011) emphasising the importance of overseeing bank dividend payouts. It attracted a significant amount of attention when risky banks and near-default banks maintained large dividend payments despite incurring substantial losses during the 2007–09 financial crisis (Acharya *et al.*, 2011; Hirtle, 2014; Acharya *et al.*, 2017). The literature postulates two key reasons for risky bank managers' unwillingness to cut dividends (Acharya *et al.*, 2011). The first is the possibility that bank managers might have engaged in risk-shifting by paying dividends at the expense of bank creditors, thereby shifting the default risk to creditors and insured depositors. A second explanation is that they feared cutting dividends would signal financial uncertainty to investors and, subsequently, hinder their refinancing plans.

On the other side of the coin, it is well known in the literature that dividend payouts represent an ongoing commitment that helps address the agency conflict of free cash flow between managers and shareholders (Easterbrook, 1984; Jensen, 1986). At the same time, it may also prompt creditors to monitor the bank's cash flows, creating another agency conflict between debtholders and shareholders (e.g., Lepetit *et al.*, 2018). This implies that bank managers are under pressure not only to signal their solvency to market investors but also under increased monitoring by debtholders to prevent wealth expropriation via dividends. Motivated by this premise, we examine how bank debtholders, namely depositors and subordinated debtholders, influence bank dividend policy by focusing on three key theories – *risk-shifting*, *monitoring*, and *signalling* hypotheses – during the 2007/09 financial crisis, and the pre- and post-crisis periods.

The literature on the determinants of banks' payout policy rarely accounts for the type of debtholders and how they may impact bank dividend policy. A handful of studies documents that banks distribute dividends to signal their financial health to bank debtholders, which is known in the literature as the *signalling hypothesis* (e.g., Kauko 2012; Forti and Schiozer, 2015). They argue that banks maintain dividend payments and they attempt to avoid the need to reduce dividends because external economic agents might perceive dividend cuts or omissions as distressingly negative signals. Meanwhile, other studies argue that large dividend payments can be misused by insolvent banks as dividends, leading to an effective transfer of wealth from debtholders (depositors and other creditors) or taxpayers to bank equity holders through insurance schemes and other government guarantees (e.g., bailouts) (Onali, 2014; Acharya et al., 2017; Pugachev, 2022). This means that shareholders benefit from bank default risk at the expense of debtholders and the government guarantors (risk-shifting).

However, the literature lacks evidence on whether bank debtholders can help address the problem of wealth transferring via dividend payments. Indeed, studies examining the role of bank debtholders mainly stem from the market discipline literature that addresses risk-taking and not risk-shifting. For example, some influential studies highlight the role of subordinated debtholders on bank risk, documenting that they can discipline bank managers, mitigate their risk-taking, and prevent gambling activities (e.g., Sironi, 2003; Gropp and Vesala, 2004; Niu, 2008; Nguyen, 2013; Danisewicz *et al.*, 2018). This behaviour is linked to what is known in the market discipline literature as the *monitoring hypothesis*. On the other hand, other studies argue that senior debt (i.e., deposits) is relevant too, and possibly even more influential given that it represents a far larger share of total assets than subordinated debt and therefore can reduce bank risk-taking (e.g., Francis *et al.*, 2019; Schaeck *et al.*, 2012). Borrowing from the literature, the present paper seeks to move forward with a novel analysis of the influence of insured and uninsured debtholders on banks' dividend policy focusing on three key hypotheses: *risk-shifting hypothesis*, *monitoring hypothesis*, and *signalling hypothesis*. To the best of our knowledge, we are the first to study the relationship between debt seniority and dividend payouts by examining the different types of debt and how they impact dividend policy of banks.

The key goal of this study is to understand whether debtholders' funds (including those from depositors and subordinated debtholders) are exploited to transfer wealth to shareholders in the form of dividends (Onali, 2014; Acharya et al., 2017; Pugachev, 2022). Importantly, it helps us examine whether debtholders can constitute an effective corrective mechanism, which may discipline risky bank managers from moral hazard practices (risk-shifting). Market discipline is critically important to the stability of the banking industry and helps mitigate moral hazard practices and enhances efficiency (Flannery and Bliss, 2019). In fact, Basel III has incorporated market discipline as a third key pillar for effective bank supervision that complements capital and supervisory elements (BCBS, 2005; Berger *et al.*, 2020). Under this pillar banks are required to maintain transparency and provide information that allow market participants to evaluate banks' soundness and stability. The rationale behind this transparency is that investors, creditors, and depositors are more likely to favour banks that are perceived to be sound, over those perceived to be fragile. That is, market participants may refrain from investing in a bank if its level of risk is unacceptably high and its incentive to reduce moral hazard behaviour is limited. Accordingly, we seek to examine whether senior and junior debts can be used as an effective market discipline device and, equally important, whether subordinated debt can be a useful addition to the existing regulatory instruments to curb wealth expropriations. As such, this research is even more relevant today in a post-pandemic time where the COVID-19 crisis already resulted in cutting or suspending dividends to conserve cash and limit misuse of cash at the onset of the pandemic.

Having recognised the heterogeneity in bank debt, we turn our attention to understanding the key channels (i.e., deposits and subordinated debt) through which each dividend theory may hold. Regarding the risk-shifting theory, some studies argue that large dividend payments can effectively transfer wealth from debtholders (depositors and subordinated debtholders) to bank equity holders (Onali, 2014; Acharya et al., 2017; Pugachev, 2022). This is because from the bank shareholders' perspective, the optimal dividend policy is determined by the charter value of the bank when the risk of default is nontrivial. That is, in a scenario in which a bank's charter value is lower than a certain threshold, it is prudent to escape the burden of debt and breach the priority of debtholders over equity holders by distributing cash in the form of dividends, thereby leaving depositors and subordinated debtholders holding an empty shell (De Cesari et al., 2023).[1] This is highly likely in the presence of deposit insurance and other implicit government guarantees, such as bailout packages and too-big-to-fail policies, all of which reduce the risk of financial loss for creditors and other stakeholders (Bessler and Nohel, 1996). With that in mind, we expect debtholders' money, namely depositors and subordinated debtholders, to be distributed to shareholders in the form of dividends when the bank faces solvency issues. However, identifying the debt channels bank managers use to transfer wealth seems ambiguous and unclear due to government guarantees (e.g. deposit insurance and bailouts), and regulatory changes (e.g., Depositor Preference Laws)[2] that shift the incentive of bank managers, which may also make the channels time-varying depending on the macroeconomic condition.

For the signalling theory, a handful of studies documents that banks distribute dividends to signal their financial health to bank debtholders (e.g., Kauko 2012; Forti and Schiozer, 2015). This is because a bank's financial strength is unobservable to the public, and therefore, the announcement of a cut or an omission of the regular quarterly dividend may prompt them to reconsider their relationship with the dividend-cutting bank. As a results, banks maintain dividend payments and they attempt to avoid the need to reduce dividends because external economic agents might perceive dividend cuts or omissions as distressingly negative signals. In fact, if bank customers and debtholders begin to doubt in the bank's ability to meet its financial obligations, its financing model collapses, triggering runs and other costs of distress. Depositors and other creditors, in turn, perceive dividend payments as a key source of information of profitability and soundness. Therefore, dividends help address banks inherent fragility and reduce information asymmetry costs that banks face. It remains unclear, however, whether banks signal to all their creditors with the same importance or whether they care about depositors more than other creditors, likely because deposits are significantly larger than subordinated debt relative to bank assets. That is, bank managers would not be incentivised to pay dividends, which is a costly signal, just to raise a small amount of subordinated debt. Understandably, they would prefer to signal to bank depositors since they are the main source of fund for banks which is relatively cheap. It is worth noting that this is also dependent on macroeconomic conditions and regulatory changes within the banking sector.

With regards to the monitoring theory, some studies in the market discipline literature argue that deposits, which represents a far larger share than other bank debts, may have the relative strength to discipline bank managers. This is because deposits are a cheap source of funds for banks, and depositors can discipline bank managers by requiring higher interest rates or withdrawing their deposits during stressful periods (Martinez Peria and Schmukler, 2001; Schaeck, 2012; Francis *et al.*, 2019). Furthermore, from the bank's perspective, because switching costs exist in the deposit market, it takes time to increase the amount of its deposits.[3] In fact, the competition between banks in the deposit market largely takes the form of attracting new depositors (Flannery 1982; Niu *et al.*, 2008). This leads bank managers not to abscond with the funds to reduce the possibility of a deposit run at which point depositors find it optimal to withdraw their cash, weakening the bank's position in the inter-bank market.

However, a large proportion of deposits benefit from a deposit insurance system that reduces the direct market pressure exerted by depositors since they are guaranteed their money back during bankruptcy, reducing their incentive to exert pressure on risky banks to cut dividends (Kanas, 2013; Lepetit *et al.*, 2018).[4] This strong protection of such depositors could lead to the expropriation of other debtholders that would catalyse the moral hazard behaviour in banks by transferring funds to owners (Onali, 2014). This is particularly true if shareholders' pressure to pay dividends is stronger than that of debtholders, which provides an explanation for why some banks continue paying dividends during financial turmoil.

On the other hand, the monitoring theory can also hold through the subordinated debt channel owing to the unique characteristics of subordinated debt. Specifically, it is the least senior debt compared to other bank debt obligations and, therefore, when a bank fails it serves as cushion because it is the first to absorb losses after equity. It is paid back only after deposits are repaid. Therefore, subordinated debtholders have a strong incentive to monitor bank risk since their funds serve as a loss absorber and they do not gain any benefits from bank excessive risk-taking (Niu, 2008; Chen and Hasan, 2011). Equity holders, in contrast, are also susceptible to losses; but, at the same time, they gain from the increased risk that accrues to excessive risk-taking and therefore their incentives for risk are stronger than that of subordinated debtholders (Gorton and Santomero, 1990; Kwast *et al.*, 1999; Nguyen, 2013).

A further advantage of subordinated debtholders is that they are generally sophisticated investors, which makes them more capable of accurately assessing changes in a bank's condition and react accordingly (Kwast *et al.*, 1999; Nguyen, 2013). Indeed, Birchler (2000) states that non-depositors (e.g., subordinated debtholders) have superior monitoring technologies and their monitoring costs are lower relative to depositors'. They are capable of imposing *ex ante* restrictive covenants that limit dividend payments (and repurchases) that effectively transfer wealth from depositors and the taxpayer to bank shareholders, particularly when the bank is financially distressed (Kalay, 1982; Acharya *et al.*, 2017).[5] In practice, however, while dividend-restricting covenants might be used to prevent wealth expropriation, their number and effectiveness can be limited. Creditors might lack the incentive to monitor, and they might find it difficult to draft a complete *ex ante* contract. There is also a risk that such creditors might underestimate the bank's probability of distress. More importantly, banks are less likely to fully internalise the externalities of their policies, making it more difficult to gauge their true economic leverage and financial condition (Acharya *et al.*, 2017).[6] Accordingly, we expect both depositors and subordinated debtholders to be the key channels through which the monitoring theory holds but the impact may vary over time as there might be shifts in incentives to monitor due to regulatory changes, government intervention, or the real economic condition.

Overall, because we have three different channels (i.e., insured deposits, uninsured deposits, and subordinated debt) through which each dividend theory may hold, it renders our key hypotheses mutually non-exclusive. That is, they may all occur simultaneously or at different points in time since we examine three key periods separately (pre-crisis, crisis, post-crisis). Taking a closer look at each period individually allows us to do a more granular analysis at the role of bank debtholders (i.e., insured depositors, uninsured depositors, and subordinated debtholders) and uncover potential changes from one period to another. Indeed, potential explanations in the shifts of the incentives may include, among others: (i) regulatory changes such as debt seniority structure - depositor preference laws (DPLs) - and Basel III, (ii) government intervention such as bailouts (e.g., quantitative easing and Troubled Asset Relief Programme) and deposit insurance scheme, or (iii) macroeconomic conditions such as crises and lax/tightened monetary policy.

In this paper, we examine the relationship between debt seniority structure and payout policy by testing the effect of insured and uninsured debtholders on bank dividends using Tobit (and OLS) regressions. We regress our continuous dependent variable dividend-to-asset ratio (*DivAs*) on banks' subordinated debt ratio, insured deposits and uninsured deposits ratios interacted with a risky-banks dummy. We also include a broad set of control variables as well as bank and time fixed effects. Relying on a sample of 7147 individual banks, we run all regressions over three distinct macroeconomic periods: the pre-crisis period (2004Q1-2006Q4); the crisis period (2007Q1-2009Q4); and post-crisis period (2010Q1-2014Q4).[7] We then run comparable regressions for unlisted and listed banks separately to contrast our results and reduce the problems associated with sample heterogeneity. Recognising that the coefficients on the interaction terms in nonlinear models are not clearly captured by their signs and magnitude (Norton *et al.*, 2004), we compute the marginal effects of our Tobit regressions to determine the impact of our three key variables on dividend payouts.

Our main findings can be summarised as follows. First, we show that the *monitoring hypothesis* holds only for unlisted banks through the insured deposits channel at all times. This implies that insured depositors have the relative strength to discipline bank managers when they are insolvent. Second, we show that subordinated debt is associated with larger dividends for unlisted banks with low-to-medium level of risk before and after the crisis, providing evidence in favour of the *signalling hypothesis*. For listed banks, in contrast, uninsured deposits explain larger dividends for banks with low-to-medium risk in the post-crisis period, in line with the *signalling hypothesis*. Our results for high-risk banks and low-risk banks individually are qualitatively similar to the main results, but the individual groups analysis provides additional channels for the *monitoring hypothesis* and *signalling hypothesis*, whilst yielding further insights for the *risk-shifting hypothesis*. Specifically, PLC banks tend to distribute large dividends after the crisis when their risk of default is high, fearing the consequences of cutting dividends. Taken together, our results suggest that the incentives for bank signalling through dividend payments and the incentives to cut dividends are strongly related to the debt seniority structure, while the risk-shifting is only marginally related to the bank debt seniority structure.

By examining the impact of insured and uninsured debt on dividend policy, we contribute to two growing strands of banking literature: dividend policy and market discipline. First, our paper provides a significant contribution to the dividend policy strand as it tests three key dividend theories (i.e., *risk-shifting*, *monitoring*, *signalling*). We are not aware of any study examining the *monitoring hypothesis* in the dividend payout literature, but we are aware of many theoretical and empirical studies that examine the *risk-shifting hypothesis* (e.g., Kanas, 2013; Onali, 2014; Cziraki *et al.*, 2016; Acharya *et al.*, 2017; Duqi *et al.*, 2020; De Cesari *et al.*, 2023) and the *signalling hypothesis* (Easterbrook, 1984; Rozef, 1982; Jensen, 1986; Abreu and Gulamhussen, 2013). In practice, these studies ignore the debt channels through which these theories might hold as they only examine these theories from the risk and growth opportunity perspectives. In this context, we are the first to decompose the debt channels through which a dividend theory may hold by accounting for the different types of debt. Thus, our findings corroborate studies highlighting banks' incentives to signal their financial health to their debtholders (e.g., Kauko, 2012; Forti and Schiozer, 2015), or engage in risk-shifting behaviour (e.g., Onali, 2014; Acharya et al., 2017), whilst also accounting for the monitoring theory, which has not been investigated in the dividend payout context.

Second, by revealing the role of bank debtholders on dividend policy, our paper contributes to the market discipline literature that investigates the effects of depositors and subordinated debtholders on bank discipline. Key studies in this strand suggest that subordinated debtholders help decrease bank risk-taking (e.g., Sironi 2003; Decamps *et al.*, 2004; Gropp and Vesala, 2004; Distinguin, 2008; Niu, 2008; Nguyen, 2013), whereas others provide evidence emphasising the key role senior debt (i.e., deposits) plays in market discipline (e.g., Martinez Peria and Schmukler, 2001; Davenport and McDill, 2006; Schaeck *et al.*, 2012; Francis *et al.*, 2019). However, these studies only highlight bank risk-taking without addressing the wealth expropriation problem via dividend payments. Accordingly, we build upon these studies by testing how insured depositors, uninsured depositors, and subordinated debtholders may act as a market discipline device that prevents transferring wealth to shareholders, which is under-researched. We complement previous studies in the market discipline literature calling for the increased reliance on subordinated debt as a tool for disciplining risk-taking and as a complement to regulatory monitoring, since it is anticipated to increase bank monitoring and discipline bank managers and (e.g., Distinguin, 2008; Chen and Hasan, 2011; Nguyen, 2013). Our paper, thus, builds a bridge between the market discipline and dividend payout literature by exploring bank debtholders' ability to discipline bank managers during normal times and crises.

The remainder of this paper is organised as follows. Section 2 presents a brief review of the literature and the hypotheses development; Section 3 introduces the methodology, variables and data used in the paper; the main results are provided and discussed in Section 4; robustness checks are presented in Section 5; and Section 6 concludes debating some policy implications.

2 | LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1 | Market discipline literature

Several empirical studies have looked at bank market discipline, focusing primarily on two major groups of stakeholders – subordinated debtholders and depositors. Regarding the former, previous studies deal with the monitoring of banks' risk-taking to enhance market discipline and, hence, curb excessive moral hazard behaviour. Some early studies argue that because subordinated debt might lose its value if the asset risk increases, it renders the incentive of subordinated debtholders to monitor bank risk-taking similar to that of regulators (e.g., Gorton and Santomero, 1990; Kwast *et al*., 1999). Other studies advocate for the increased use of subordinated debt to increase bank discipline and assist regulators in estimating bank risk (e.g., Decamps *et al*., 2004; Niu, 2008). However, Distinguin (2008) shows that national regulations and institutional and legal conditions have a profound influence on the disciplinary effect. In a number of empirical studies, evidence points out that high levels of subordinated debt are associated with lower levels of bank risk, lending adequate support to theories predicting that subordinated debt can be an effective tool to reduce moral hazard problems (e.g., Sironi, 2003; Gropp and Vesala, 2004; Chen and Hasan, 2011; Nguyen, 2013).

On the other hand, other studies emphasise the key role senior debt (i.e., deposits) plays in market discipline (e.g., Martinez Peria and Schmukler, 2001; Davenport and McDill, 2006; Schaeck *et al*., 2012). Francis *et al.* (2019) show that banks issuing senior loans are more likely to reduce their risk exposure. Martinez Peria and Schmukler (2001) provide evidence suggesting that depositors can discipline banks by requiring higher interest rate or withdrawing their deposits. Calomiris and Kahn (1991) state that depositors' possibility to withdraw their money reduce banks' incentive to abscond with funds. Schaeck *et al.* (2012), on the other hand, examine market discipline through executive dismissals and find no association neither with subordinated debtholders nor depositors.

Another branch of the literature highlights depositor monitoring during and around times of stress, in line with the "wake-up" effect on depositors to bank risk. Opiela (2004) shows that depositors monitored banks more closely around the 1997 crisis period in Thailand. Similarly, Karas *et al.* (2010) find that depositors exerted more discipline on Russian banks during the Russian crisis of 1998. By extension, Bennett *et al.* (2015) provide evidence of market discipline from insured depositors, uninsured depositors, and other creditors during the 2008 financial crisis. Similarly, Acharya and Mora (2015) show that the U.S. banks with high default risk experienced large deposit outflows during the 2008 crisis period. Overall, while the existing literature on senior debt and subordinated debt provides suggestive evidence on how debtholders can alleviate bank risk-taking, the impact of such debts on bank dividend policy remains an open empirical question that we aim to address in this paper.

2.2 | Dividend payouts literature

There is a great deal of research on dividend payout policy in the industry sector, but there has been relatively little evidence on how payout policy works for banks. A number of influential studies highlight the role of dividend payments as a risk-shifting mechanism that impinges on the firm's capital structure (e.g., Acharya *et al*., 2011; Onali, 2014). Among these studies, Kanas (2013) and Onali (2014) find that high default risk is associated with larger dividend payments, which supports the *risk-shifting hypothesis*. Similarly, Pugachev (2019), Koussis and Makrominas (2019), and De Cesari *et al.* (2023) provide evidence in favour of the risk-shifting behaviour by showing that wealth expropriation is the dominant driver of risky banks' dividends. Cziraki *et al.* (2016) and Duqi *et al.* (2020), however, report results contrary to the risk-shifting behaviour, concluding that banks did not engage in a deliberate wealth expropriation during the 2008 financial crisis.

A large volume of the literature has advanced with additional theories on dividend policy. While Miller and Modigliani (1961) argue convincingly that dividends are irrelevant, other researchers argue that dividends can be important for signalling or agency cost reasons. Miller and Rock (1985), for example, develop a dividend information model arguing that dividend payments convey managers' private information about the firm's earnings. Rozeff (1982), Easterbrook (1984) and Jensen (1986) show that dividends are used to limit managers' access to free cash flow, reducing agency problems between managers and outside investors. Abreu and Gulamhussen (2013) document that bank holding companies (BHCs) in the U.S. followed the agency cost and *signalling hypothesis* during the 2007–09 financial crisis. Similarly, Turner *et al.* (2013) shows that the signalling incentive largely explains bank dividends, while providing little support for agency, catering or behavioural determinants of dividend policy.

The importance of using dividends to signal financial confidence is underlined in an early study by Bessler and Nobel (1996), documenting that dividend cuts can lead to a large drop in bank stock returns, which is mainly why banks consider cutting dividends as a last resort measure. More recently, Kauko (2012) and Forti and Schiozer (2015) hypothesise that dividends provide a costly signal of stability and growth prospects to depositors. Meanwhile, Nissim and Ziv (2001) show that dividend changes provide important signals about future earnings. Goddard *et al.* (2006), however, provide evidence in favour of the *signalling hypothesis* arguing that the relation between corporate earnings, dividends, and stock prices is more complicated and cannot be explained by a single theory. Interestingly, Li and Zhao (2008) report results that are contrary to the signalling theory, documenting that firms with high information asymmetry are less likely to initiate, pay, or increase dividends.

A branch of the dividend literature highlights the so-called life-cycle theory, which states that dividends are usually paid by mature and established firms. DeAngelo *et al.* (2006) show that firms with a high earned/contributed capital mix are mature firms with large cumulative profits and thus more likely to pay dividends. Similarly, Fairchild *et al.* (2014) provide evidence in favour of the life-cycle theory with little support for the signalling hypothesis for firms in Thailand. Meanwhile, another stream of the literature identifies the catering theory, pioneered by Baker and Wurgler (2004), under which mangers use dividends to cater to the market investors' sentiment. Li and Lie (2006) extend the catering theory and find that firms pay larger dividends when the prevailing dividend premium in the market is high. Hoberg and Prabhala (2009) and Kuo *et al.* (2013), however, find mixed results and suggest that the catering theory effect disappears after introducing risk proxies.

2.3 | Hypotheses development

The literature above produces mixed results and suggests that identifying the determinants of bank dividends is a daunting challenge. Importantly, the issue of the effect of debt seniority structure on dividend policy is still ambiguous as it has not been addressed empirically. This examination allows us to check whether insured and uninsured debtholders' funds are exploited or used as a monitoring device that disciplines risky banks, and whether the effect varies during normal times and crises. Accordingly, we investigate the role of insured and uninsured debt on bank dividend policy by testing the three key hypotheses below:

Risk-shifting hypothesis – This hypothesis was originally considered in two early studies by Jensen and Meckling (1976) and Myers (1977) and was revisited recently by Acharya *et al.* (2011), Onali (2014), Cziraki *et al.* (2016), and Duqi *et al.* (2020). It states that high dividend payments can be exploited to transfer wealth from bank debtholders to bank shareholders' private pockets, thereby breaching the priority of debtholders over equity holders. This is highly likely in the presence of deposit insurance and other implicit government guarantees, such as bailout packages and too-big-to-fail policies, all of which reduce the risk of financial loss for creditors and other stakeholders (Bessler and Nohel, 1996). In this context, we argue that if weak banks with a high share of insured and/or uninsured debt pay high dividends, this reflects a wealth transfer from debtholders to shareholders, through which leaves debtholders holding an empty shell if the bank defaults.[8]

Monitoring hypothesis – The market discipline literature suggests that debtholders can exert a substantial influence in disciplining bank managers from taking risk and counteract moral hazard behaviours (Niu, 2008; Nguyen, 2013). On one hand, subordinated debtholders are capable of imposing *ex ante* restrictive covenants that limit dividend payments that may cause wealth expropriation (Kalay, 1982; Acharya *et al.*, 2017). On the other hand, senior debts, mainly insured and uninsured deposits, are a key source of fund for banks and these depositors can discipline bank managers by requiring higher interest rate and/or withdrawing their deposits (Martinez Peria and Schmukler, 2001; Schaeck *et al.*, 2012). Indeed, even minimal responses to risk by these depositors might have a significant impact on the quantity and price of bank debt (Schaeck *et al.*, 2012). Hence, we anticipate that if senior or subordinated debtholders play a significant role in reducing dividends for risky banks, this represents a significant ability to impose greater discipline on these banks, thereby mitigating wealth expropriation behaviours.

Signalling hypothesis – It is well known in the literature that depositors and other debtholders use bank dividends as a key source of information that signals profitability and soundness. At the same time, banks explicitly use dividends as a signalling device to deliver private information concerning future earnings prospects (Miller and Rock, 1985; Kauko 2012; Forti and Schiozer, 2015). This is because a bank's financial strength is unobservable to the public, and therefore, depositors and other creditors perceive dividend announcements as viability signals. Accordingly, we conjecture that low-risk banks, holding a higher share of insured and/or uninsured debt, have a higher incentive to pay larger dividends to signal their financial health.[9]

Note that our hypotheses are mutually non-exclusive as none of these hypotheses rules out the others. They could all hold simultaneously or at different points in time since a hypothesis can hold through different channels at the same time. For example, the market discipline effects may be stronger for subordinated debt and uninsured deposits, since both types of debtholders have more of their own funds at risk, so the *monitoring hypothesis* may hold for uninsured depositors and subordinated debtholders but not insured depositors. The same applies on the *risk-shifting hypothesis* and *signalling hypothesis*. If a hypothesis does not hold through any of our three key channels (insured deposits, uninsured deposits, subordinated debt), it indicates that the debt seniority structure does not play any role in this dividend hypothesis. In addition, the underlying channels that support our hypotheses are expected to be time-varying. This is because our entire sample period (2004:Q1-2014:Q4) contains a booming period that preceded the global financial crisis, a financial crisis (2007-09), new reforms and regulations in response to the crisis (Basel III), and bailouts (quantitative easing and Troubled Asset Relief Programme). Thus, our empirical analysis divides our entire sample period into three periods (per-crisis, crisis, post-crisis) to determine the channels through which each hypothesis may hold during each period, if any.

3 | METHODOLOGY AND DATA

3.1 | Data and sample selection

We use the quarterly Reports of Condition and Income (Call Reports) as our main source of bank data. We retrieve quarterly frequency income statement and balance sheet data for unconsolidated commercial banks starting from 2004:Q1 and ending in 2014:Q4 as some of our key variables are missing in later years. To account for publicly listed banks that are mostly BHCs, we consolidate the Call Report data at the BHC level if it owns more than one bank. However, we retain the data for the commercial bank if the bank is independent. We refer to either entity as "banks" for ease of exposition. Entities that do not refer to commercial banks (RSSD9331 different from 1) or have missing data for our key variables are excluded from the sample.[10] For publicly listed banks, we merge their data with the CRSP data, namely stock price information. Our final sample is an unbalanced panel of 7147 banks comprising 68,371 bank-quarter observations for the pre-crisis period (2004Q1 – 2006Q4), 72,644 observations for the crisis period (2007Q1 – 2009Q4), and 106,995 observations for the post-crisis period (2010Q1 – 2014Q4) covering the period 2004:Q1 to 2014:Q4.

3.2 | Deposit and subordinated debt variables

We begin by obtaining total deposits values from the Call Reports for every bank and quarter. We calculate uninsured deposits using Call Report Schedule RC-O by subtracting the amount of insured deposits from all the funds in deposit accounts, whilst carefully accounting for the changes in deposit insurance limits over our sample period. More specifically, for the period 2004:Q1-2006:Q1, insured deposits are the amount of bank deposit accounts of $100,000 or less (RCON2702 before 2006Q2). After 2006Q2, it includes retirement accounts of $250,000 or less to account for the different treatment of such accounts versus the rest. From 2009Q3 onwards, reporting thresholds on non-retirement deposits increased from $100,000 to $250,000 except for foreign ones (RCONF049+ RCONF045). After identifying the amount on insured deposits throughout our sample period, we calculate uninsured deposits as the difference between total deposits (RCON2200) and insured deposits for every bank and every quarter (e.g., Acharya and Mora, 2015; Berger *et al.*, 2020). In the next step, we create our three key variables of interest, which are the insured deposits ratio, *InDeposit*, measured by dividing insured deposits (as calculated above) by total assets; uninsured deposit ratio, *UnDeposit*, calculated by the difference between total deposits and insured deposits divided by total assets; the subordinated debt ratio, *SND*, is measured by simply dividing the amount of subordinated debt by total assets.[11]

3.3 | Control variables

We also include a broad set of control variables in our models to mitigate a potential omitted variable problem. They are also proxies for additional hypotheses examined in the literature. In particular, we include the ratio of asset growth (*AGrowth*) that captures historical growth, calculated as the first difference in the natural logarithm total assets; bank size (*Size*) measured by taking the natural logarithm of the bank's total assets; and return to assets (*ROA*), calculated by dividing net income to total assets, that captures bank profitability. Note that a positive sign on both *ROA* and *Size* with a negative sign on *AGrowth* provide evidence consistent with the Fama and French (2001) hypothesis, which states that larger banks with high-profitability, and low growth rate are more likely to pay dividends.

Our control variables also include the retained earnings ratio (*RETE*), measured by dividing retained earnings to total equity, capturing mature banks with high earned/contributed capital mix consistent with the life-cycle theory; bank capital (*CAP*) measured by the Tier 1 ratio to capture the heterogeneity of banks' capital.[12] As we consolidate our banks at the BHC level, we collect the Tier 1 ratio for that BHC bank and use it as a capital ratio. It is important to note that undercapitalised banks in the U.S. are restrained from distributing dividends due to capital regulations provided in the PCA. As such, we add a dummy variable *Pressure* that takes the value of one if a bank's Tier 1 ratio is less than 6% or its total capital ratio (CAR) is less than 10%.[13] This represents the regulatory pressure imposed on undercapitalised banks and their managements (Abreu and Gulamhussen, 2013).[14]

We also include the natural logarithm of distance-to-default, *ZScore*, as a proxy for bank solvency, measured by the sum of *ROA* and equity capital (equity-to-asset ratio) ratios over the standard deviation of *ROA*.[15] Note that *ZScore* is inversely proportional to risk, which means that a higher *ZScore* indicates soundness while a lower ratio indicates high risk of default and insolvency (e.g., Kanas, 2013; Onali, 2014).[16] We also add the dummy variable, *RiskH*, that groups our that are facing extreme solvency situations in one group. It takes the value of one if the bank's level of risk is at the lowest 10th percentile, and zero otherwise, using the *ZScore* measure. Finally, we add the *Loss* dummy that takes

TABLE 1 Description of the variables

Variable	Definition
Dependent variables	
DivAs	Dividend-to-total asset ratio for the reference period (%)
DivEq	Dividend-to-total equity ratio for the reference period (%)
Independent variables	
InDeposits	Insured deposits divided by total assets for the reference period (%), as explained in Section 3.2
UnDeposit	Total deposits minus insured deposits divided by total assets for the reference period (%), as explained in Section 3.2
SND	The ratio of subordinated debt to total assets for the reference period (%)
AGrowth	Assets growth measured as the first difference in the natural logarithm of total asset (%)
Size	Bank size measure as the natural logarithm of total asset
ROA	Bank profitability measured as the earnings before tax-to-total asset (%)
RETE	Retained earnings to total equity ratio for the reference period (%)
CAP	Capital ratio measured as Tier 1 capital divided by risk-weighted assets for the reference period (%)
ZScore	Bank solvency measured as (ROA+EA) over the standard deviation of ROA (natural logarithm)
Pressure	Dummy takes the value of unity if the bank lies in the lowest 5th percentile using EA, it represents regulatory pressure
Loss	Dummy takes the value of unity if the bank's net income is negative and zero otherwise for the reference period
MBV (PLC)	Bank market value (total assets minus the book value of equity plus market capitalisation) over total assets (%)
DivPremium(PLC)	The log difference in the value-weighted average MBV of dividend payers and value-weighted average MBV of dividend non-payers
RiskH	Dummy takes the value of unity if the banks lies in the lowest 10th percentile using *ZScore*, and zero otherwise

Note: The table displays the variables used in this paper. Variables are obtained from the Call Reports retrieved from WRDS. Market capitalisation used for calculating *MBV* is obtained from CRSP.

the value of one for observations with negative net income, and zero otherwise. It helps capture bank monitoring by various stakeholders since a negative net income is likely to trigger attention of all stakeholders (e.g., Schaeck *et al.*, 2012). We winsorise bank financial variables at the 1st and 99th percentiles to eliminate extreme values.[17] See Table 1 for a complete description of the variables and respective sources.

3.4 | Empirical model

This study focuses on the impact of insured and uninsured debtholders on dividend policy, aiming at distinguishing between the risk-shifting and monitoring effects on the one hand, and the signalling effect on the other hand.

Empirically, we begin by introducing our baseline model that investigates the impact of subordinated debt, insured deposits, and uninsured deposits on dividend payouts (see Equation 1 below). Then, we expand it to our benchmark model in which we interact our three key variables (i.e. subordinated debt, insured deposits, uninsured deposits) by a risky-banks dummy to examine their impact beyond the signalling level and account for the risk-shifting and monitoring effects (see Equation 2 below). We run our regressions over three different periods, the precrisis period (2004Q1-2006Q4), crisis period (2007Q1-2009Q4) and the post-crisis period (2010Q1-2014Q4). The equations are expressed as follows:

$$\begin{aligned} Div_{i,t} = {} & \beta_1 SND_{i,t} + \beta_2 InDeposit_{i,t} + \beta_3 UnDeposit_{i,t} + \beta_4 AGrowth_{i,t} + \beta_5 Size_{i,t} + \\ & \beta_6 ROA_{i,t} + \beta_7 CAP_{i,t} + \beta_8 Risk_{i,t} + \beta_9 Pressure_{i,t} + \beta_{10} RETE_{i,t} + \beta_{11} Loss_{i,t} + \mu_i + \nu_t + \varepsilon_{i,t} \end{aligned} \tag{1}$$

$$\begin{aligned} Div_{i,t} = {} & \beta_1 SND_{i,t} + \beta_2 InDeposit_{i,t} + \beta_3 UnDeposit_{i,t} + \beta_4 RiskH_{i,t} + \beta_5 SND_{i,t} * RiskH_{i,t} \\ & + \beta_6 InDeposit_{i,t} * RiskH_{i,t} + \beta_7 UnDeposit_{i,t} * RiskH_{i,t} + \beta_8 AGrowth_{i,t} + \beta_9 Size_{i,t} + \beta_{10} ROA_{i,t} \\ & + \beta_{11} CAP_{i,t} + \beta_{12} Risk_{i,t} + \beta_{13} Pressure_{i,t} + \beta_{14} RETE_{i,t} + \beta_{15} Loss_{i,t} + \mu_i + \nu_t + \varepsilon_{i,t} \end{aligned} \tag{2}$$

where *i* and *t* represent bank and time, respectively. *Div* is dividend-to-asset ratio (*DivAs*) during the reference quarter. Our key variables are *SND*, the bank's subordinated debt ratio, measured as the ratio of subordinated debt to total assets; *InDeposit*, this ratio is the total of insured deposits calculated as explained above divided by total assets; *UnDeposit*, the ratio of uninsured deposits, measured as the difference between total deposits and insured deposits divided by total assets (see Section 3.2). In Equation 2, *RiskH* is a dummy variable that takes the value of one if the bank's level of risk, based on *ZScore* measure, is at the lowest 10^{th} percentile, and zero otherwise. By interacting this dummy variable with subordinated debt, insured deposits and uninsured deposits ratios, we contrast the effect of these types of debt for high-risk banks and banks with low-to-medium level of risk, and therefore, disentangling different hypotheses simultaneously.

In particular, we examine three key hypotheses: (i) *risk-shifting hypothesis*, (ii) *monitoring hypothesis*, and (iii) *creditors-signalling hypothesis*. That is, in Equation 2, a significantly positive coefficient on any interaction term provides evidence in favour of *risk-shifting hypothesis*, whereas a negative sign lends support to the *monitoring hypothesis*. Conversely, a significantly positive coefficient on any of our three key variables (non-interaction), which represents the average banks that are low-to-medium level of risk, provides evidence consistent with the *signalling hypothesis*, whereas a negative sign might indicate that these banks have no incentives to send signals to their creditors.

As our dividend measure cannot have negative values and censored at zero (no dividends paid), we employ the Tobit regression model; ordinary least square (OLS) provides biased and inconsistent outcomes for such analyses (Wooldridge, 2010). Our dividend measure is zero in approximately 40% of the observations for the entire sample period. In all specifications, we use robust standard errors, clustered by banks, to control for heteroscedasticity and any possible correlation between observations of the same bank. Bank and year fixed effects are included in all regressions. However, the literature suggests the inclusion of fixed effects in nonlinear models results in the so-called incidental parameter problem, which leads to biases in the results and coefficients estimated. With this in mind, we rerun our regressions using OLS estimator to contrast our results, as OLS may still provide similar results to some extent when the dependent variable is censored below at zero.[18] Importantly, to build more confidence in our findings, we also run our main regressions in an extra analysis using the Poisson model and compare the results with our main findings (Section 5.1). This is because Poisson model is less prone to suffer from the incidental parameter problem, and therefore may lend strong support to our main results.

3.5 | Summary statistics

Table 2, Panel A, presents a set of summary statistics for all the variables used for our three periods (full period (2007Q1-2014Q4): pre-crisis period (2004Q1-2006Q4), crisis period (2007Q1-2009Q4) and post-crisis period (2010Q1-2014Q4). Dividend ratio, as a percentage of assets (equity), has a downward trend over the three periods.

TABLE 2 Descriptive statistics on the regression variables

	Panel A: Summary statistics on the regression variables											
	Pre-Crisis Period				Crisis Period				Post-Crisis Period			
	mean	sd	min	max	mean	sd	min	max	mean	sd	min	max
DivAs	0.35	0.47	0.00	2.27	0.29	0.43	0.00	2.27	0.23	0.38	0.00	2.27
DivEq	3.44	4.60	0.00	20.38	2.79	4.08	0.00	20.38	2.16	3.46	0.00	20.38
SND	0.03	0.20	0.00	1.40	0.03	0.19	0.00	1.40	0.02	0.15	0.00	1.40
MBV	2.12	20.40	0.95	507.69	8.53	55.75	0.91	507.69	10.43	60.40	0.91	507.69
DivPremium	2.59	1.03	0.59	3.69	−0.48	0.52	−1.41	0.49	0.33	0.89	−0.99	2.05
RiskH	0.10	0.30	0.00	1.00	0.10	0.30	0.00	1.00	0.10	0.30	0.00	1.00
AGrowth	2.46	5.84	−11.16	26.40	2.21	5.91	−11.16	26.40	0.99	4.59	−11.16	26.40
Size	11.81	1.36	7.10	20.80	11.96	1.39	7.11	21.05	12.13	1.30	7.22	21.11
ROA	0.67	0.72	−3.45	2.95	0.34	0.93	−3.45	2.95	0.44	0.72	−3.45	2.95
InDeposit	49.50	15.09	0.00	83.82	50.02	16.27	0.00	83.82	61.90	13.89	0.00	83.82
UnDeposit	81.64	10.84	0.00	93.06	80.57	12.68	0.00	93.06	83.89	9.37	0.00	93.06
CAP	17.57	15.30	6.04	159.34	18.11	18.87	6.04	159.34	17.72	14.13	6.04	159.34
ZScore	3.56	0.58	1.08	5.33	3.42	0.71	1.08	5.33	3.57	0.77	1.08	5.33
RETE	49.09	34.84	−179.36	99.39	43.23	40.30	−179.36	99.39	37.83	52.99	−179.36	99.39
Pressure	0.01	0.10	0.00	1.00	0.02	0.15	0.00	1.00	0.03	0.17	0.00	1.00
Loss	0.06	0.23	0.00	1.00	0.18	0.38	0.00	1.00	0.12	0.32	0.00	1.00

Panel B: Additional summary statistics on types of debt					
Banks split by	Insured Deposits		Uninsured Deposits		Subordinated Debt
DivAs		*DivAs*		*DivAs*	
High	56.09	High	82.73	High	0.025
Low	53.88	Low	81.86	Low	0.029
Size		*Size*		*Size*	
Bigger	51.72	Bigger	81.8	Bigger	0.05
Smaller	58.13	Smaller	82.77	Smaller	0.004
Tier 1 Ratio		*Tier 1 Ratio*		*Tier 1 Ratio*	
High	55.16	High	80.81	High	0.02
Low	54.81	Low	83.81	Low	0.04
ZScore		*ZScore*		*ZScore*	
High	55.86	High	81.99	High	0.02
Low	54.16	Low	82.58	Low	0.03
RETE		*RETE*		*RETE*	
High	57.52	High	82.95	High	0.017
Low	52.45	Low	81.64	Low	0.037
BHC		*BHC*		*BHC*	
Yes	54.54	Yes	81.39	Yes	0.07
No	55.04	No	82.41	No	0.02
PLC		*PLC*		*PLC*	
Yes	44.7	Yes	75.89	Yes	0.25
No	55.18	No	82.42	No	0.02

(Continues)

TABLE 2 (Continued)

Note: This table displays means, standard deviations, minimums, and maximums for all the variables used. It distinguishes between the pre-crisis period (2004Q1-2006Q4), crisis period (2007Q1-2009Q4), and post-crisis period (2010Q1-2014Q4). See Table 1 for variable definitions.
Note: Table 2 Panel B displays additional summary statistics on banks' insured deposits, uninsured deposits, and subordinated debt ratios on the basis of other variables: *DivAs*, *Size*, *CAP*, *ZScore*, *RETE*, *BHC*, and PLC for the full period (2004-2014). See Table 1 for variable definitions.

Specifically, it decreases from 0.35% (3.44%) before the crisis to 0.29% (2.79%) during the crisis period reaching 0.23% (2.16%) after the crisis. Subordinated debt appears to have decreased in the post-crisis period, from approximately 0.32% before and during the crisis period to approximately 0.02% after the crisis. This is not surprising since the ratio of bank deposits, both insured and uninsured, are observed to increase dramatically after the crisis. That is, insured (uninsured) deposits rise from approximately 50% (81%) before and during the crisis periods to 62% (84%) for the post-crisis period, which reflects the fact that banks increased their senior liabilities after the crisis that led to a drop in other (subordinated) liabilities.

In Panel B, Table 2, we display some additional summary statistics on insured deposits, uninsured deposits, and subordinated debt, our key variables of interest, to shed light on the determinants of cross-sectional heterogeneity among them. Specifically, we use some of the variables in Panel A and divide banks into two groups on the basis of the value of that variable. This allows us to examine how these three key variables differ across the two groups. For example, while banks with larger dividend payouts (above median *DivAs*) operate with slightly lower subordinated debt ratio, this is not true for both insured and uninsured deposits as banks paying larger dividends appear to operate with higher amount of such deposits (with insured deposits being slightly higher than uninsured deposits). Consistent with expectations, bigger banks (above median *Size*) operate with much higher subordinated debt, however, they hold less insured and uninsured deposits. Further, banks with low capital (below median *Tier 1*) hold higher share of subordinated debt and uninsured deposits, which reflects that such banks favour increasing their subordinated debt to offset against capital shortage since it is more expensive to increase their capital. In contrast, banks with high capital operate with higher insured deposits in line with prediction that depositors prefer to deal with well-capitalised banks. Although identifying the determinants of our three key types of debt is beyond the scope of this study, and despite the fact that these are merely summary statistics, they are nonetheless interesting and illuminate the reason of why banks show nontrivial heterogeneity in insured deposits, uninsured deposits, and subordinated debt; this is an important fact for understanding how differences in key bank debts drive differences in dividend policy.

4 | RESULTS AND DISCUSSION

This section discusses our main results. First, we investigate the effect of insured and uninsured debts on banks' dividends for all banks and analyse their impact based on grouping weak banks. The results are reported in Table 3. Then, we discuss our results for unlisted banks and listed banks separately and report the results in Tables 4 and 5, respectively.

4.1 | Do senior debt and junior debt impact bank dividend payouts?

Before discussing the results of our benchmark model, we need to address a methodological issue that arises from the interaction terms between our three key variables and the risk dummy in our Tobit regressions. While the interaction effect in linear regressions (e.g., OLS) can be clearly captured by the sign and magnitude of its coefficient, this is not true in nonlinear models (e.g., Tobit). The literature clearly states that in nonlinear models the magnitude of an

TABLE 3 Regression results for all banks

	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE
	PreCrisis	PreCrisis	PreCrisis	Crisis	Crisis	Crisis	PostCrisis	PostCrisis	PostCrisis
	1	2	3	4	5	(6)	7	8	9
	DivAs	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*
SND	−0.00538	0.135***	0.240***	−0.0265	0.0215	0.0253	−0.0455	−0.00164	−0.0847*
	(0.0303)	(0.0461)	(0.072)	(0.0262)	(0.0250)	(0.0473)	(0.0322)	(0.0286)	(0.0492)
	[−0.003415]		[0.0743]	[−0.010408]		[0.00852]	[−0.018748]		[−0.0191]
*RiskH*SND*	−0.0227	0.0756*	0.00563	0.00744	0.0881***	0.111*	−0.0586	−0.00552	−0.17
	(0.0499)	(0.0437)	(0.0532)	(0.0707)	(0.0334)	(0.0642)	(0.115)	(0.0311)	(0.113)
	[−0.0119842]		[0.006905]	[0.002942]		[0.0234714]	[−0.0098975]		[−0.025444]
lnDeposit	0.00870***	−0.000643	0.00132	0.00619***	3.51e−05	0.000467	0.00324***	0.000446	0.00073
	(0.000500)	(0.000619)	(0.000964)	(0.000437)	(0.000349)	(0.000683)	(0.000447)	(0.000517)	(0.000897)
	[0.003795]		[0.000357]	[.002366]		[0.000059]	[0.000951]		[0.0000721]
RiskH lnDeposit*	−0.00205*	0.000465	−0.00163*	−0.00338***	0.000229	−0.00219**	−0.00641***	−7.78e−05	−0.00347**
	(0.00115)	(0.000649)	(0.000969)	(0.00113)	(0.000430)	(0.000972)	(0.00165)	(0.000549)	(0.00148)
	[−0.0004285]		[−0.00051]	[−0.0013554]		[−0.000482]	[−0.0020543]		[−0.000587]
UnDeposit	−0.00299***	0.000724	0.00666***	−0.000309	−0.00137**	0.000302	3.68e−05	0.00274***	0.00566***
	(0.000857)	(0.000823)	(0.00146)	(0.000766)	(0.000639)	(0.00148)	(0.000974)	(0.000862)	(0.00144)
	[−0.00121]		[0.00197]	[−0.000137		[0.0000474]	[−0.000012		[0.00107]
RiskH UnDeposit*	0.00287	−0.000948	−0.00281	−0.000304	−0.000932	−0.00101	−0.000696	−0.00184*	0.000305
	(0.00185)	(0.00107)	(0.00197)	(0.00230)	(0.00111)	(0.00243)	(0.00243)	(0.000981)	(0.00204)
	[.0012552]		[−0.00078]	[−0.000125]		[−0.0002241]	[−0.000186]		[−0.0001067]
RiskH	−0.00562	0.0489	0.344**	0.201	0.0309	0.143	0.204	0.127*	0.115
	(0.144)	(0.0802)	(0.156)	(0.180)	(0.0876)	(0.199)	(0.179)	(0.0741)	(0.149)
	[0.060287]		[0.0105]	[0.002427]		[−0.0104]	[−0.080284]		[−0.0137]
AGrowth	-0.0115***	0.000817**	−0.00149***	−0.0107***	−0.000738***	−0.00330***	−0.00443***	−0.000533**	−0.000652
	(0.000676)	(0.000335)	(0.000559)	(0.000617)	(0.000285)	(0.000583)	(0.000521)	(0.000260)	(0.000449)
	[−0.005127]		[−0.00046]	[−0.00433]		[−0.000772]	[−0.001617]		[−0.000123]

(Continues)

TABLE 3 (Continued)

	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE
	PreCrisis	PreCrisis	PreCrisis	Crisis	Crisis	Crisis	PostCrisis	PostCrisis	PostCrisis
	1	2	3	4	5	(6)	7	8	9
	DivAs	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*
Size	0.0295***	−0.217***	−0.119**	0.0333***	−0.0719***	−0.00575	0.0212***	−0.0830***	−0.0732***
	(0.00456)	(0.0277)	(0.0463)	(0.00430)	(0.0221)	(0.0422)	(0.00420)	(0.0166)	(0.0266)
	[0.0132034]		[−0.0368]	[0.01343]		[−0.00135]	[0.00773]		[−0.0137]
ROA	0.514***	0.248***	0.407***	0.427***	0.181***	0.277***	0.504***	0.174***	0.363***
	(0.0158)	(0.00943)	(0.0149)	(0.0103)	(0.00569)	(0.0111)	(0.0136)	(0.00572)	(0.0143)
	[0.229727]		[0.126]	[0.17224]		[0.0648]	[0.184023]		[0.0681]
CAP	−0.000991	0.000176	−0.00318***	−0.00223***	9.64e−05	−0.00337***	−0.00212***	−0.000988**	−0.00333***
	(0.000617)	(0.000420)	(0.000727)	(0.000617)	(0.000300)	(0.000764)	(0.000635)	(0.000400)	(0.000839)
	[−0.0004428]		[−0.000984]	[−0.0009002]		[−0.000791]	[−0.000775]		[−0.000625]
ZScore	−0.214***	−0.0211***	−0.122***	−0.261***	−0.0543***	−0.131***	−0.177***	−0.0422***	−0.0871***
	(0.0132)	(0.00738)	(0.0152)	(0.00864)	(0.00475)	(0.01)	(0.00808)	(0.00300)	(0.00706)
	[−0.0955614]		[−0.0377]	[−0.10534]		[−0.0306]	−.0645284		[−0.0164]
RETE	0.00152***	−0.00488***	−0.00806***	0.00148***	−0.00218***	−0.00187***	0.00300***	−0.000144	−0.000896*
	(0.000179)	(0.000544)	(0.000856)	(0.000164)	(0.000246)	(0.00057)	(0.000133)	(0.000118)	(0.00048)
	[0.000681]		[−0.00249]	[.000596]		[−0.00044]	[0.0011]		[−0.000168]
Pressure	−0.0356	0.0343**	0.0306	−0.00868	0.0428***	0.00317	−0.235***	0.0357***	−0.055
	(0.0307)	(0.0140)	(0.0227)	(0.0248)	(0.0121)	(0.0231)	(0.0484)	(0.00912)	(0.0502)
	[−0.0155695]		[0.00976]	[−0.003486]		[0.00075]	[−0.073428]		[−0.00981]

(Continues)

TABLE 3 (Continued)

	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE
	PreCrisis	PreCrisis	PreCrisis	Crisis	Crisis	Crisis	PostCrisis	PostCrisis	PostCrisis
	1	2	3	4	5	(6)	7	8	9
	DivAs	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*
Loss	−0.0176	0.162***	0.132***	−0.0784***	0.0601***	0.0235*	0.0155	0.122***	0.134***
	(0.0318)	(0.0130)	(0.0343)	(0.0139)	(0.00591)	(0.0124)	(0.0151)	(0.00510)	(0.0146)
	[−0.0078]		[0.0462]	[−0.030637]		[0.00559]	[0.005709]		[0.0281]
Observations	68,371	68,371	68,371	72,644	72,644	72,644	106,995	106,995	106,995
Bank FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared		0.710			0.683			0.652	

Note: The table displays our results of the impact of bank debt on dividend payouts for all banks during the pre-crisis period (2004Q1-2006Q4), the crisis period (2007Q1-2009Q4), and postcrisis period (2010Q1-2015Q4). The dependent variable is the dividend-to-asset ratio (*DivAs*). See Table 1 for variable definitions. Columns 1–3 show the results for the pre-crisis period, Columns 4–6 show the results for the crisis period, and Column 7–9 show the result for the post-crisis period. For each variable, the first row shows regression coefficient, second row shows standard error, and third row shows marginal effect. The marginal effects for our interaction terms are calculated following the methodology of Norton *et al.* (2004) by taking the discrete difference between our dummy values. All regressions are estimated with robust standard errors, clustered at the bank level. *** p<0.01, ** p<0.05, * p<0.1.

TABLE 4 Regression results for unlisted banks

	Tobit No FE	OLS	Tobit FE	Tobit No FE	OLS	Tobit FE	Tobit No FE	OLS	Tobit FE
	PreCrisis	PreCrisis	PreCrisis	Crisis	Crisis	Crisis	PostCrisis	PostCrisis	PostCrisis
	1	2	3	4	5	6	7	8	9
	DivAs	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*
SND	−0.0230	0.104**	0.208***	−0.0551*	0.00390	0.0117	−0.116***	−0.0266	−0.133**
	(0.0340)	(0.0463)	(0.0780)	(0.0294)	(0.0202)	(0.0451)	(0.0362)	(0.0255)	(0.0549)
	[−0.01029]		[0.0633]	[−0.0223113]		0.00395	[−0.04044]		−0.0261
*RiskH*SND*	−0.00179	0.0814*	0.00163	−0.00426	0.0581**	0.0538	0.0467	0.0378	−0.0481
	(0.0547)	(0.0462)	(0.0576)	(0.0708)	(0.0293)	(0.0637)	(0.121)	(0.0296)	(0.116)
	[−0.00255]		[0.004638]	[−0.001857]		[0.0111573]	[0.025603]		−0.0040809
InDeposit	0.00853***	−0.000673	0.00116	0.00602***	3.45e−05	0.000434	0.00300***	9.65e−05	0.000229
	(0.000510)	(0.000628)	(0.000992)	(0.000443)	(0.000350)	(0.000691)	(0.000456)	(0.000513)	(0.000894)
	[.0036952]		[0.0003]	[0.002289]		0.0000522	[0.000864]		−0.0000286
RiskH InDeposit*	−0.00219*	0.000420	−0.00170*	−0.00324***	0.000202	−0.00211**	−0.00623***	−0.000173	−0.00382***
	(0.00115)	(0.000655)	(0.000979)	(0.00114)	(0.000432)	(0.000993)	(0.00167)	(0.000538)	(0.00146)
	[−0.00051]		[−0.00053]	[−0.001294]		[−0.00046]	[−0.00197]		−0.0006305
UnDeposit	−0.00298***	0.000916	0.00656***	−0.000500	−0.00126*	0.000138	−0.000346	0.00204**	0.00537***
	(0.000879)	(0.000847)	(0.00149)	(0.000785)	(0.000663)	(0.00152)	(0.000995)	(0.000870)	(0.00149)
	[−0.0012]]		[0.00192]	[−0.0002151]		[0.00002]	[−0.000154]		0.00102
RiskH UnDeposit*	0.00280	−0.000695	−0.00239	−0.000360	−0.000641	−0.000531	−0.000799	−0.00176*	0.000259
	(0.00186)	(0.00109)	(0.00205)	(0.00232)	(0.00113)	(0.00250)	(0.00244)	(0.000993)	(0.00206)
	[0.00121]		[−0.00064]	[−0.00015]		[−0.00012]	[−0.000168]		−0.00011
RiskH	0.00878	0.0289	0.313*	0.198	0.00745	0.0994	0.206	0.127*	0.138
	(0.146)	(0.0817)	(0.164)	(0.182)	(0.0889)	(0.206)	(0.181)	(0.0759)	(0.153)
	[0.060728]		[0.00989]	[0.001891]		−0.0109	[−0.078401]		−0.0140
AGrowth	−0.0115***	0.000847**	−0.00145**	−0.0107***	−0.000657**	−0.00318***	−0.00438***	−0.000646**	−0.000591
	(0.000687)	(0.000337)	(0.000577)	(0.000625)	(0.000287)	(0.000608)	(0.000526)	(0.000260)	(0.000476)
	[−0.005102]		[−0.000441]	[−0.004283]		−0.000736	[−0.001588]		−0.000112
Size	0.0219***	−0.233***	−0.154***	0.0245***	−0.0955***	−0.0453	0.0126***	−0.0619***	−0.104**

(Continues)

TABLE 4 (Continued)

	Tobit No FE	OLS	Tobit FE	Tobit No FE	OLS	Tobit FE	Tobit No FE	OLS	Tobit FE
	PreCrisis	PreCrisis	PreCrisis	Crisis	Crisis	Crisis	PostCrisis	PostCrisis	PostCrisis
	1	2	3	4	5	6	7	8	9
	DivAs	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*
	(0.00502)	(0.0245)	(0.0476)	(0.00479)	(0.0257)	(0.0517)	(0.00460)	(0.0182)	(0.0446)
	[0.009728]		[−0.0469]	[0.00983]		−0.0105	[0.004587]		−0.0196
wROA	0.516***	0.248***	0.407***	0.432***	0.183***	0.282***	0.505***	0.173***	0.365***
	(0.0160)	(0.00949)	(0.0150)	(0.0105)	(0.00573)	(0.0111)	(0.0139)	(0.00576)	(0.0145)
	[0.229393]		[0.124]	[0.173358]		0.0653	[0.183204]		0.0690
CAP	−0.00127*	0.000194	−0.00442***	−0.00277***	−7.03e−05	−0.00529***	−0.00269***	−0.00106**	−0.00463***
	(0.000670)	(0.000473)	(0.00109)	(0.000692)	(0.000350)	(0.00116)	(0.000716)	(0.000458)	(0.00116)
	[−0.000565]		[−0.00135]	[−0.0011122]		−0.00123	[−0.00098]		−0.000875
ZScore	−0.214***	−0.0216***	−0.120***	−0.263***	−0.0548***	−0.132***	−0.178***	−0.0415***	−0.0892***
	(0.0135)	(0.00747)	(0.0152)	(0.00875)	(0.00472)	(0.0100)	(0.00825)	(0.00300)	(0.00726)
	[−0.095255]		[−0.0364]	[−0.105442]		−0.0305	[−0.0646014]		−0.0168
RETE	0.00159***	−0.00480***	−0.00799***	0.00152***	−0.00229***	−0.00218***	0.00307***	−0.000247**	−0.000969**
	(0.000181)	(0.000550)	(0.000868)	(0.000166)	(0.000235)	(0.000541)	(0.000136)	(0.000116)	(0.000484)
	[0.000706]		[−0.00243]	[0.00061]		−0.000506	[0.00112]		−0.000183
Pressure	−0.0341	0.0341**	0.0267	−0.00636	0.0389***	−0.00619	−0.235***	0.0341***	−0.0606
	(0.0309)	(0.0142)	(0.0229)	(0.0249)	(0.0121)	(0.0233)	(0.0498)	(0.00904)	(0.0527)
	[−0.0148452]		[0.00833]	[−0.002545]		−0.00143	[−0.072861]		−0.0108

(Continues)

TABLE 4 (Continued)

	Tobit No FE	OLS	Tobit FE	Tobit No FE	OLS	Tobit FE	Tobit No FE	OLS	Tobit FE
	PreCrisis	PreCrisis	PreCrisis	Crisis	Crisis	Crisis	PostCrisis	PostCrisis	PostCrisis
	1	2	3	4	5	6	7	8	9
	DivAs	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*
Loss	−0.0176	0.161***	0.133***	−0.0759***	0.0608***	0.0245**	0.0130	0.121***	0.136***
	(0.0322)	(0.0131)	(0.0343)	(0.0142)	(0.00584)	(0.0124)	(0.0152)	(0.00506)	(0.0147)
	[−0.007761]		[0.0458]	[−0..029532]		0.00576	[0.00474]		0.0286
Observations	67,197	67,197	67,197	71,386	71,386	71,386	105,068	105,068	105,068
Bank FE	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared		0.710			0.685			0.654	

Note: The table displays our results of the impact of bank debt on dividend payouts for unlisted banks during the pre-crisis period (2004Q1-2006Q4), the crisis period (2007Q1-2009Q4), and postcrisis period (2010Q1-2015Q4). The dependent variable is the dividend-to-asset ratio (*DivAs*). See Table 1 for variable definitions. Columns 1–3 show the results for the pre-crisis period, Columns 4–6 show the results for the crisis period, and Column 7–9 show the result for the post-crisis period. For each variable, the first row shows regression coefficient, second row shows standard error, and third row shows marginal effect. The marginal effects for our interaction terms are calculated following the methodology of Norton *et al.* (2004) by taking the discrete difference between our dummy values. All regressions are estimated with robust standard errors, clustered at the bank level. *** p<0.01, ** p<0.05, * p<0.1.

TABLE 5 Regression results for PLC banks

	Tobit No FE	OLS	Tobit FE	Tobit No FE	OLS	Tobit FE	Tobit No FE	OLS	Tobit FE
	PreCrisis	PreCrisis	PreCrisis	Crisis	Crisis	Crisis	PostCrisis	PostCrisis	PostCrisis
	1	2	3	4	5	6	7	8	9
	DivAs	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*
SND	−0.0823	0.420***	0.407**	0.0211	0.0781	0.0223	0.106*	0.220**	0.202*
	(0.0678)	(0.144)	(0.161)	(0.0758)	(0.147)	(0.139)	(0.0569)	(0.110)	(0.111)
	[−0.047212]		0.233	[0.011145]		0.00613	[0.04516]		0.0699
*RiskH*SND*	0.0669	0.0222	0.0142	−0.00355	0.195	−0.0830	−0.134	−0.128	−0.176
	(0.131)	(0.0785)	(0.0866)	(0.222)	(0.124)	(0.218)	(0.300)	(0.157)	(0.197)
	[0.042949]		−0.0047459	[0.000997]		[−0.04621]	[−0.062617]		−0.0641224
InDeposit	0.00990***	−0.00436	−0.00343	0.00489	−0.000242	0.00262	0.00682***	0.00619*	0.00809
	(0.00221)	(0.00453)	(0.00560)	(0.00299)	(0.00357)	(0.00448)	(0.00241)	(0.00316)	(0.00516)
	[0.005705]		−0.00225	[0.002464]		0.000980	[0.002795]		0.00320
RiskH InDeposit*	−0.00769	−0.00391	−0.00533	−0.00325	0.00228	−0.00303	−0.0108	0.000688	0.00428
	(0.00746)	(0.00348)	(0.00454)	(0.00578)	(0.00384)	(0.00524)	(0.00926)	(0.00488)	(0.00749)
	[−0.004958]		−0.0027798	[−0.00143]		[−0.0013]	[−0.00478]		0.0023002
UnDeposit	−0.00264	0.00392	0.0105**	0.00353	−6.58e−06	0.00212	0.00446	0.0130*	0.0152
	(0.00291)	(0.00435)	(0.00528)	(0.00310)	(0.00385)	(0.00514)	(0.00367)	(0.00734)	(0.0102)
	[−0.000698]		0.00625	[0.001269]		−0.000411	[0.002203]		0.00607
RiskH UnDeposit*	0.0156***	0.00317	0.00440	−0.0127	−0.0125	−0.0336***	0.00122	0.00845	0.00947
	(0.00359)	(0.00291)	(0.00597)	(0.0141)	(0.00867)	(0.0110)	(0.0160)	(0.00891)	(0.0140)
	[0.0090695]		0.00206315	[−0.008131]		−0.0201913	[−0.000245]		0.00493535
RiskH	−0.943***	−0.103	−0.149	1.276	0.908	2.823***	0.231	−0.700	−0.865
	(0.299)	(0.263)	(0.508)	(1.183)	(0.680)	(0.938)	(1.041)	(0.558)	(0.815)
	[−0.037671]		−0.0137	[0.12565]		0.106	[−0.106144]		0.0318
MBV	−0.0161***	−0.0174	−0.0194	−0.00101	0.00109	−0.0137***	0.000128	−0.00111	−0.000977
	(0.00485)	(0.0125)	(0.0123)	(0.000940)	(0.00118)	(0.00489)	(0.000301)	(0.000686)	(0.000643)
	[−0.0101]		−0.0110	[−0.001]		−0.00572	[0.0001]		−0.000368
DivPremium	−0.0370	−0.0793**	0.0313	−0.451**	−0.512**	−0.762***	0.203***	0.289***	0.335***
	(0.0327)	(0.0394)	(0.0341)	(0.199)	(0.218)	(0.272)	(0.0558)	(0.0468)	(0.0652)
	[−0.0230644]		0.0178	[−0.24237]		−0.319	[0.09798]		0.127

(Continues)

TABLE 5 (Continued)

	Tobit No FE	OLS	Tobit FE	Tobit No FE	OLS	Tobit FE	Tobit No FE	OLS	Tobit FE
	PreCrisis	PreCrisis	PreCrisis	Crisis	Crisis	Crisis	PostCrisis	PostCrisis	PostCrisis
	1	2	3	4	5	6	7	8	9
	DivAs	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*
AGrowth	−0.00692***	0.00107	0.000354	−0.00828**	−0.00162	−0.00128	−0.00708**	−0.00129	−0.000557
	(0.00233)	(0.00191)	(0.00210)	(0.00344)	(0.00280)	(0.00282)	(0.00329)	(0.00175)	(0.00214)
	[−0.004318]		0.000202	[−0.00445]		−0.000536	[−0.003413]		−0.000210
Size	0.0963***	−0.137	−0.127	0.0606***	−0.00814	−0.0445	0.0482***	−0.0686*	−0.0240
	(0.0244)	(0.0948)	(0.0872)	(0.0220)	(0.0763)	(0.0742)	(0.0151)	(0.0401)	(0.0535)
	[0.060083]		−0.0725	[0.03254]		−0.0186	[0.02322]		−0.00904
ROA	0.421***	0.318***	0.513***	0.212***	0.0646	0.0635	0.381***	0.137***	0.196***
	(0.0828)	(0.0915)	(0.0989)	(0.0619)	(0.0504)	(0.0574)	(0.0579)	(0.0454)	(0.0712)
	[0.262612]		0.292	[0.113729]		0.0266	[0.18365]		0.0740
CAP	−0.000791	−0.000434	−0.000505	−0.000468	0.000494	4.42e-05	−0.000372	−0.000400	−0.000644
	(0.000567)	(0.000449)	(0.000414)	(0.000759)	(0.000445)	(0.000446)	(0.000633)	(0.000616)	(0.000768)
	[−0.0004931]		−0.000287	[−0.000252]		0.0000185	[−0.00018]		−0.000243
ZScore	−0.247***	−0.120**	−0.379***	−0.0792	0.0176	−0.0335	−0.0560	−0.00414	0.0125
	(0.0577)	(0.0551)	(0.101)	(0.0640)	(0.0344)	(0.0469)	(0.0385)	(0.0230)	(0.0356)
	[−0.15398]		−0.216	[−0.042516]		−0.0140	[−0.02697]		0.00471
RETE	−0.000926	−0.00907***	−0.0128***	0.00192**	0.00319	0.00689*	0.00187**	0.000984	0.00278
	(0.00106)	(0.00285)	(0.00329)	(0.000907)	(0.00334)	(0.00384)	(0.000783)	(0.00140)	(0.00288)
	[−0.000578]		−0.00730	[0.001032]		0.00288	[0.001]		0.00105
Pressure	−0.0342	0.109	0.128	0.293	0.154*	0.230	0.0702	−0.0208	−0.0696
	(0.163)	(0.124)	(0.166)	(0.202)	(0.0911)	(0.143)	(0.149)	(0.0653)	(0.153)
	[−0.020798]		0.0830	[0.19014]		0.122	[0.0355]		−0.0247

(Continues)

TABLE 5 (Continued)

	Tobit No FE	OLS	Tobit FE	Tobit No FE	OLS	Tobit FE	Tobit No FE	OLS	Tobit FE
	PreCrisis	PreCrisis	PreCrisis	Crisis	Crisis	Crisis	PostCrisis	PostCrisis	PostCrisis
	1	2	3	4	5	6	7	8	9
	DivAs	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*
Loss	−0.105	0.274***	0.0362	−0.0838	−0.000296	-0.0314	0.0499	0.0981*	−0.0113
	(0.130)	(0.0887)	(0.0497)	(0.0638)	(0.0647)	(0.0901)	(0.0904)	(0.0561)	(0.112)
	[−0.060881]		0.0214	[−0.043264]		−0.0129	[0.02475]		−0.00422
Observations	1,174	1,174	1,174	1,258	1,258	1,258	1,927	1,927	1,927
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared		0.722			0.621			0.589	

Note: The table displays our results of the impact of bank debt on dividend payouts for publicly listed banks during the pre-crisis period (2004Q1-2006Q4), the crisis period (2007Q1-2009Q4), and postcrisis period (2010Q1-2015Q4). The dependent variable is the dividend-to-asset ratio (*DivAs*). See Table 1 for variable definitions. Columns 1–3 show the results for the pre-crisis period, Columns 4–6 show the results for the crisis period, and Column 7–9 show the result for the post-crisis period. For each variable, the first row shows regression coefficient, second row shows standard error, and third row shows marginal effect. The marginal effects for our interaction terms are calculated following the methodology of Norton *et al.* (2004) by taking the discrete difference between our dummy values. All regressions are estimated with robust standard errors, clustered at the bank level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

interaction effect does not equal the marginal effect of the interaction term and may also have an opposite sign (e.g., Norton *et al.*, 2004). With that in mind, we calculate the marginal effects in our Tobit regressions following the methodology of Norton *et al.* (2004) and compute the discrete difference between our dummy values.

Table 3 reports the results for our benchmark model (Equation 2) using both Tobit and OLS estimators. Columns 2, 5, and 8 display the results of our OLS regressions including bank fixed effects, whereas the rest of the Columns display the results of our Tobit regressions (i.e., Columns 1, 3, 4, 6, 7, 9). To build confidence in our results, we require significance in more than one regression during the same period since we present our results using different techniques. First, in the pre-crisis period, banks with low-to-medium level of risk holding subordinated debt and a large amount of uninsured deposits tend to pay larger dividends (Columns 2–3), while insured deposits reduce dividends for risky banks (Columns 1 and 3). Second, during the crisis period, subordinated debt explains bank dividends for risky banks (Columns 5 - 6), whereas insured deposits reduce dividends for risky banks (Columns 4 and 6). Third, the post-crisis results show that insured deposits reduce dividends for risky banks (Columns 7 and 9), whereby uninsured deposits have a positive impact on bank with low-to-medium level of risk (Columns 8 - 9). These results, when taken together, provide suggestive evidence that the *monitoring hypothesis* holds during the crisis and post-crisis periods, while the *signalling hypothesis* holds during the pre- and post-crisis periods, with some evidence in favour of the *risk-shifting* during the crisis.

When interpreting these results in the context of key theories, meaningful economic interpretations can be provided. Taking the pre-crisis period, for example, uninsured deposits and subordinated debt play a key role in explaining larger dividends for banks with low-to-medium level of risk. This means that uninsured debt was the key channel through which these banks signalled their financial strength to the market. A plausible explanation might be that before the crisis these banks were likely to focus more on the financial market access and other interbank relations as a risk-mitigation resort. This provides suggestive evidence in favour of the *signalling hypothesis* through the uninsured debt channel (i.e., subordinated debt and uninsured deposits). Quantitatively, a one percent increase in subordinated debt (uninsured deposits) leads to an increase of approximately 7.4 b.p. (0.2 b.p.) on average in dividend payouts (Column 3). This result suggests that subordinated debt played a stronger role on banks' signalling incentive than uninsured deposits during the pre-crisis period. For risky banks, in contrast, we find that insured deposits can discipline risky bank managers from distributing dividends to some extent, as the significance is at the 10% level (Columns 3). This provides some evidence that insured depositors have more incentives to exert monitoring power on the banks they deal with, consistent with the *monitoring hypothesis*.

Regarding the crisis period, the role of subordinated debt plays a significant role for banks that are close to default, and they seem to use dividend payments to exercise significant wealth transfer from creditors to shareholders. Managers chose to escape the burden of debt and distribute their assets in the form of cash payments, thereby leaving subordinated debtholders holding an empty shell. This means that subordinated debtholders did not have the relative strength to limit risky banks' dividends and had a little or no incentive to monitor risky banks' managers. On average, a one percent increase in subordinated debt leads to an increase of approximately 2.3 b.p. in dividend payouts (Column 6).

Interestingly, while subordinated debt does not discipline risky bank managers from paying dividends during the crisis, insured depositors appear to be more relevant and can impose market discipline on banks when their risk of failure is high. This is evident by the negative sign on insured deposits interaction that is statistically significant at the 5%, lending adequate support to the *monitoring hypothesis* (Columns 4 and 6). Quantitatively, a one percent increase in insured deposits leads to a reduction of approximately 0.05 b.p. in dividend payouts (Column 6). This indicates that depositors can discipline risky banks by withdrawing their deposits or charging higher rates (albeit the effect is not large), with both extremes can destabilise the bank's financial health. In addition, Francis *et al.* (2019) document that while subordinated debt may be used for market discipline, banks are more inclined to use senior debt, highlighting the prominent role of senior debts in the bank capital structure. Our findings are in line with this argument. Given that the weight of subordinated debt in the capital structure of the average bank seems pretty low (relative to insured and/or uninsured deposits), we can conjecture that it might not be plausible that a relatively low level of subordinated debt has a significant influence on banks' payout policy especially during turmoil. In fact, banks would not accept significant limitations to their payout decisions just to raise a small amount of subordinated debt. Rather, they are more likely to distribute it as dividend payments in case of insolvency. This provides suggestive evidence that senior debt is relevant and even more influential since it represents a far larger share of total assets than subordinated debt.

After the global financial crisis, we observe that insured depositors discipline banks facing extreme credit situations from paying dividends. This suggests that in response to the crisis insured depositors have developed a vested interest in disciplining bank managers by tightening their disciplinary restrictions and have more monitoring incentives when the risk of failure is high. Quantitatively, risky banks cut down their dividends by approximately 0.06 b.p. for every one percentage point increase in insured deposits (Columns 7 and 9). For uninsured deposits, on the other hand, they explain larger dividend payments for banks with low-to-medium levels of risk, consistent with the *signalling hypothesis*. A one percentage point increase in uninsured deposits for these banks leads to an increase in dividends payouts by approximately 0.1 b.p. (Columns 8–9). This result suggests that dividend payments are an important source of information, mainly, for uninsured depositors and not subordinated debtholders owing to their larger share (and amount) of total assets relative to subordinated debt.

Regarding our control variables, we observe that the Fama and French's (2001) hypothesis does not hold at all times. Bank capital (*CAP*) exerts a significantly negative impact during the three periods, suggesting that banks holding high capital reduce their dividends, or alternatively, banks holding low capital pay larger dividends. In line with our theories, bank solvency (*ZScore*) has a significantly negative impact on bank dividend payouts at all times. This suggests that banks with high level of default risk pay larger dividends. Surprisingly, regulatory pressure does not appear to be an effective tool in limiting dividend distributions by undercapitalised banks at all times. Finally, the coefficient on *Loss* dummy appears significantly positive for banks in all periods, suggesting that banks that incurred net losses pay large dividend payments. This indicates that being profitable is not the main driver for bank dividends as banks may rely on leveraged dividends.

4.2 | Does the impact vary between unlisted banks and listed banks?

One may wonder whether the heterogeneity in our main sample would impact our results since our sample includes both unlisted and publicly listed banks, each of which has different likelihood to pay dividends and, therefore, may behave differently. In addition, bank deposits and subordinated debt may not provide the same relative strength of bank discipline between listed (PLC, thereafter) and unlisted banks due to the problem of information asymmetry. This is because the problem of information asymmetry that exists between lenders and borrowers or between bank managers and stockholders is greater for unlisted banks. In addition, PLC banks have an extra burden to pay dividends sometimes since they need to respond to investors' sentiment by catering to the demand for dividend payments. Therefore, bank debtholders may not affect PLC banks in the same way they affect their unlisted counterparts. Accordingly, we rerun our models on a subsample of unlisted banks and a subsample of PLC banks. Note that for our PLC subsample regressions, we include the market-to-book value (*MBV*) and dividend premium (*DivPremium*) ratios.

The former, *MBV*, is defined as the market value of bank assets over their book value (see Table 1 for further details). Traditionally, this ratio captures future growth and it is a key measure to test the *signalling hypothesis* for PLC banks since banks' potential future growth opportunities and performance are well reflected in their market value (e.g., Li and Zhao, 2008; Allen *et al*., 2012). However, there exists another view that it reflects bank charter value. With low charter value, shareholders benefit from dividend payments that shift the default risk to taxpayers and creditors (e.g., Gambacorta *et al*., 2020; De Cesari *et al*., 2023). On the other hand, *DivPremium* is the stock market dividend premium variable, calculated as the log difference in the value-weighted average *MBV* of dividend payers and value-weighted average *MBV* of dividend non-payers (Baker and Wurgler, 2004). It reflects the increase in demand for dividends and whether bank managers respond (cater) to the prevailing investor sentiment by paying dividends (see Table 1 for further details).

The results for unlisted banks and PLC banks are reported in Tables 4 and 5, respectively. In both tables, as before, Columns 2, 5, and 8 display the results of our OLS regressions including bank fixed effects, and the remainder Columns report the results of our Tobit regressions (i.e., Columns 1, 3, 4, 6, 7, 9). We obtain three main results for our key variables of interest. First, during the pre-crisis, a higher share of subordinated debt significantly increase dividend payouts for all banks with low-to-medium level of risk, consistent with the *signalling hypothesis* (Columns 2–3 in Tables 4–5). This means that both PLC and unlisted banks distributed dividends to signal their financial strength to the market focusing mainly on subordinated debtholders. Furthermore, we also show that insured depositors reduce unlisted banks' dividends when their risk of default is high, in line with the *monitoring hypothesis*. This implies that insured depositors had a little impact on bank dividends before the crisis.

Second, during the crisis period, insured deposits significantly reduce dividend payments for unlisted banks when they are close to default (Columns 4 and 6 in Table 4). This is interesting since it shows that insured depositors have the relative strength to discipline unlisted banks from wealth expropriation. In fact, Birchler (2000) shows that depositors may monitor more intensively than non-depositors due to the greater loss in the event of bankruptcy. It is not surprising then that depositors play the key role in reducing unlisted banks' dividends during financial stress (Danisewicz *et al.*, 2018): a one percentage point increase in insured deposits for unlisted risky banks leads to a fall in bank dividend by 0.05 b.p. (Column 6).

Third, after the crisis, uninsured deposits explain larger dividend payments for unlisted bank with low-to-medium level of risk (Columns 7 and 9 in Table 4). This suggests that unlisted banks after the 2007–09 global financial crisis focus more on signalling their financial health to uninsured depositors, possibly due to their large share of bank debt relative to subordinated debt. For PLC banks, on the other hand, both subordinated debt and insured deposits explain larger dividends for low-to-medium risk banks, which suggest that banks after the crisis focus more on signalling to insured depositors and subordinated debt, likely because these debtholders prefer to deal with a reputationally sound bank that is more likely to be a listed bank (Columns 7–8 Table 5). Taken together, these results are consistent with the *signalling hypothesis*. In contrast, insured deposits significantly reduce unlisted banks' dividends when they are risky, suggesting that insured depositors act as an effective disciplinary tool to reduce banks' wealth expropriation practices (Columns 7 and 9 in Table 4); providing evidence in favour of the *monitoring hypothesis*. This also implies that the global financial crisis may have created new patterns that are considered the new normal, in which insured depositors have a greater weight in disciplining risky banks from paying dividends, particularly unlisted banks.

For PLC banks, *MBV* has no significant impact on dividend payouts at all times. *DivPremium* has a positive impact on dividend payouts during the post-crisis period (Columns 7–9 in Table 5). This indicates that after the crisis PLC banks have been prompted to cater to the investors' sentiment and respond to the increased demand for dividend payments, consistent with the catering hypothesis. Regarding the other controls, the Fama and French's (2001) hypothesis does not hold for both unlisted and PLC banks at all times. Bank capital exerts a significantly negative impact for unlisted banks during the three periods, suggesting that well capitalised banks exercise appropriate restraint on dividends to build up their capital buffer and in anticipation of future capital needs (e.g., Onali, 2014; Abreu and Gulamhussen, 2013), whilst balancing against sending negative signals to the market (e.g., Hirtle, 2014). For PLC banks, on the other hand, bank capital has no significant impact on their dividends.

Regarding bank risk, *ZScore* exerts a significantly negative impact at all time periods for all banks, suggesting that risky banks that are close to default distribute larger dividends. Regulatory pressure does not appear to be an effective tool in limiting dividend distributions for low-capitalised banks at all times for all banks. In fact, these banks are more likely to distribute their earnings rather than using them for recapitalisation, lending additional support to the risk-shifting behaviour during the crisis. Interestingly, we find that the life-cycle theory holds only for PLC banks during the crisis period, as shown by the significantly positive sign on *RETE*. This indicates that PLC banks with a high earned/contributed capital mix that are mature firms with large cumulative profits pay larger dividends during the times of stress. Finally, the coefficient on *Loss* dummy appears significantly positive for unlisted banks in all periods, suggesting that banks that incurred net losses pay large dividend payments.

5 | ROBUSTNESS CHECKS

To assess the robustness of our results, we start by replacing the dependent variable *DivAs* by dividend-to-equity ratio (*DivEq*) and re-estimate our regressions. Second, we rescale our subordinated debt ratio by risk-weighted assets instead of total assets and rerun our regressions. Third, we exclude too-big-to-fail banks to check whether the results are somewhat driven by these banks. Fourth, we assess whether the Troubled Asset Relief Programme (TARP) has an impact on our analysis through including TARP as a dummy variable that takes the value one if the bank participated in the programme (zero, otherwise). For brevity, we only report the results for our first robustness test in which we substitute our dependent variable with the dividend-to-equity ratio. The results for our other robustness tests are reported in Appendix A.

For the first test, in which dividend-to-equity ratio (*DivEq*) is used, the results are reported in Tables 678. Our results are similar and corroborate the previous ones. In addition, we find that the coefficient on uninsured deposits for unlisted banks turns significantly positive during the post-crisis period, suggesting that uninsured depositors drive large dividend payments for these banks, providing evidence in favour of the *signalling hypothesis*. For PLC banks, we find that subordinated debt for low-to-medium risk banks loses its significance weakening the *signalling hypothesis* through subordinated debt in the post-crisis period.

For the second robustness check, one might wonder whether our results for subordinated debt remain the same if it is scaled by the portfolio risk ratio (risk-weighted assets ratio), given that subordinated debt is also classified as bank capital under Tier 2 capital. Hence, we rescale our subordinated debt by the risk-weighted asset ratio and report the results in Tables A1–A3 in Appendix A. We find that our results remain unchanged and our key findings still hold.

For our third robustness check, our sample has very large banks that are more likely to continue to pay dividends even during incurring financial losses due to the too-big-to-fail (TBTF) policy, as they anticipate government support when needed which incentivises their moral hazard behaviour. To ensure that our results are not influenced by such banks, we exclude largebanks with total assets above \$50 billion and rerun the model. The results are reported in Tables A4–A6 in Appendix A. We find that our results do not change except that for PLC banks during the crisis period, the effect of insured deposits for risky banks becomes significant during the crisis period suggesting that insured depositors play a key role in disciplining PLC banks that are close to default and not TBTF banks; during the post-crisis period, the effect of insured deposits for risky banks and uninsured deposits for low-to-medium risk banks turn significantly positive, suggesting that PLC banks that are not TBTF pay dividends to signal to uninsured depositors whilst exercising risk-shifting through the insured deposit channel.

We also assess whether the *TARP* has an impact on our analysis among PLC banks. Specifically, it would mechanically decrease/increase the magnitude of our dependent variables for banks that participated in the programme and received bailout funds from the U.S. government. Therefore, we rerun our model including *TARP* as a dummy variable that takes the value one if the bank participated in the programme (zero, otherwise).[19] The results are reported in Table A7 in Appendix A. Our main findings remain unchanged, and the TARP effect is insignificant when introduced in the crisis and post-crisis periods.

5.1 | Poisson regressions

The literature states that the inclusion of fixed effects in nonlinear models, namely Tobit, and probit/logit, may lead to biased and inconsistent results due to the incidental parameter problem, despite the fact that the location coefficients are unimpacted by the incidental parameters problem in the Tobit model (Greene, 2004). This is because the maximum likelihood function used in Tobit model is inherently inconsistent after which other estimates are inaccurate. For this reason, we rerun our regression using the Poisson model, which is mainly used for count censored dependent variables. From a theoretical standpoint, however, while Poisson regression model is mainly used for count dependent variables,

TABLE 6 Robustness Check – *DivEq*: All Banks

	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE
	PreCrisis	PreCrisis	PreCrisis	Crisis	Crisis	Crisis	PostCrisis	PostCrisis	PostCrisis
	1	2	3	4	5	6	7	8	9
	DivEq	*DivEq*	*DivEq*	*DivEq*	*DivEq*	*DivEq*	*DivEq*	*DivEq*	*DivEq*
SND	0.139	1.474***	2.636***	0.00377	0.328	0.410	−0.831***	−0.253	−1.036**
	(0.294)	(0.446)	(0.672)	(0.273)	(0.246)	(0.462)	(0.307)	(0.218)	(0.463)
	[0.04518]		[0.807]	[−0.00053]		[0.111]	[−0.3212]		[−0.233]
*RiskH*SND*	−0.380	0.567	−0.163	−0.0512	0.623*	0.670	−0.482	0.0496	−1.386*
	(0.493)	(0.477)	(0.594)	(0.649)	(0.341)	(0.655)	(1.147)	(0.213)	(0.758)
	[−0.19267]		[0.00764]	[−0.02043]		[0.134]	[-0.016962]		[−0.20168]
lnDeposit	0.0832***	−0.0143**	0.00123	0.0566***	−−0.00343	−0.00112	0.0248***	−0.00523	−0.00641
	(0.00484)	(0.00578)	(0.00912)	(0.00413)	(0.00317)	(0.00631)	(0.00431)	(0.00447)	(0.00814)
	[0.03649]		[−0.00023]	[0.02144]		[−0.00085]	[0.00668]		[−0.00191]
RiskH lnDeposit*	−0.0185	0.00434	−0.0197**	−0.0380***	0.00161	−0.0256***	−0.0650***	−0.000998	−0.0323**
	(0.0113)	(0.00658)	(0.00996)	(0.0107)	(0.00417)	(0.00933)	(0.0158)	(0.00480)	(0.0131)
	[−0.001146]		[−0.00646]	[−0.01558]		[−0.005442]	[−0.019612]		[-0.0053]
UnDeposit	−0.0189**	0.0184**	0.0886***	0.00535	−0.00462	0.0238*	0.0188**	0.0265***	0.0615***
	(0.00789)	(0.00716)	(0.0121)	(0.00677)	(0.00584)	(0.0129)	(0.00825)	(0.00753)	(0.0133)
	[−0.007299]		[0.0262]	[0.00229]		[0.00501]	[0.00686]		[0.0121]
RiskH UnDeposit*	0.0267	−0.0138	−0.0361**	0.00294	−0.0136	−0.0235	−0.000173	−0.0198**	−0.00281
	(0.0186)	(0.0106)	(0.0176)	(0.0184)	(0.00927)	(0.0201)	(0.0192)	(0.00977)	(0.0211)
	[0.012541]		[−0.00983]	[0.00113]		[−0.0056]	[−0.00242]		[−0.002451]
Observations	68,371	68,371	68,371	72,644	72,644	72,644	106,995	106,995	106,995
Bank FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared		0.710			0.679			0.655	

Note: The table displays our robustness check results of the impact of bank debt on dividend payouts for all banks during the pre-crisis period (2004Q1-2006Q4), the crisis period (2007Q1-2009Q4), and postcrisis period (2010Q1-2015Q4). The dependent variable is the dividend-to-equity ratio (*DivEq*). See Table 1 for variable definitions. Columns 1–3 show the results for the pre-crisis period, Columns 4–6 show the results for the crisis period, and Column 7–9 show the result for the post-crisis period. For each variable, the first row shows regression coefficient, second row shows standard error, and third row shows marginal effect. The marginal effects for our interaction terms are calculated following the methodology of Norton *et al.* (2004) by taking the discrete difference between our dummy values. All regressions are estimated with robust standard errors, clustered at the bank level. *** p<0.01, ** p<0.05, * p<0.1.

TABLE 7 Robustness Check – *DivEq*: Unlisted banks

	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE
	PreCrisis	PreCrisis	PreCrisis	Crisis	Crisis	Crisis	PostCrisis	PostCrisis	PostCrisis
	1	2	3	4	5	6	7	8	9
	DivEq	*DivEq*	*DivEq*	*DivEq*	*DivEq*	*DivEq*	*DivEq*	*DivEq*	*DivEq*
SND	−0.0698	1.205***	2.411***	−0.311	0.213	0.378	−0.966***	−0.230	−1.147**
	(0.325)	(0.448)	(0.724)	(0.301)	(0.233)	(0.483)	(0.356)	(0.234)	(0.528)
	[−0.038502]		[0.727]	[−0.12433]		[0.0959]	[−0.35329]		[-0.239]
*RiskH*SND*	−0.165	0.598	−0.246	0.0225	0.425	0.294	−0.0703	0.154	−1.051
	(0.540)	(0.494)	(0.641)	(0.712)	(0.339)	(0.725)	(1.214)	(0.220)	(0.816)
	[−0.097123]		[−0.02641]	[0.01095]		[0.054447]	[0.101102]		[−0.135023]
InDeposit	0.0814***	−0.0142**	0.000653	0.0547***	−0.00358	−0.00169	0.0234***	−0.00546	−0.00632
	(0.00493)	(0.00581)	(0.00937)	(0.00418)	(0.00318)	(0.00637)	(0.00440)	(0.00456)	(0.00816)
	[0.03539]		[−0.00045]	[0.02059]		[−0.000964]	[0.006171]		[−0.00186]
*RiskH*InDeposit*	−0.0204*	0.00339	−0.0213**	−0.0368***	0.00169	−0.0242**	−0.0639***	−0.000710	−0.0341***
	(0.0113)	(0.00665)	(0.0101)	(0.0109)	(0.00421)	(0.00952)	(0.0160)	(0.00476)	(0.0131)
	[−0.00230]		[−0.006899]	[−0.014967]		[−0.005163]	[−0.019138]		[−0.00536]
UnDeposit	−0.0195**	0.0203***	0.0874***	0.00204	−0.00427	0.0204	0.0184**	0.0292***	0.0679***
	(0.00807)	(0.00737)	(0.0124)	(0.00696)	(0.00603)	(0.0133)	(0.00853)	(0.00784)	(0.0139)
	[−0.007554]		[0.0257]	[0.00084]		[0.00433]	[0.006575]		[0.0129]
*RiskH*UnDeposit*	0.0252	−0.0113	−0.0325*	0.000519	−0.0116	−0.0205	−0.00264	−0.0216**	−0.00606
	(0.0188)	(0.0107)	(0.0183)	(0.0188)	(0.00944)	(0.0208)	(0.0195)	(0.00980)	(0.0213)
	[0.011595]		[−0.00860]	[0.000193]		[−0.004871]	[-0.002934]		[−0.003134]
Observations	67,197	67,197	67,197	71,386	71,386	71,386	105,068	105,068	105,068
Bank FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R−squared	0.711			0.681			0.658		

Note: The table displays our robustness check results of the impact of bank debt on dividend payouts for unlisted banks during the pre-crisis period (2004Q1-2006Q4), the crisis period (2007Q1-2009Q4), and postcrisis period (2010Q1-2015Q4). The dependent variable is the dividend-to-equity ratio (*DivEq*). See Table 1 for variable definitions. Columns 1–3 show the results for the pre-crisis period, Columns 4–6 show the results for the crisis period, and Column 7–9 show the result for the post-crisis period. For each variable, the first row shows regression coefficient, second row shows standard error, and third row shows marginal effect. The marginal effects for our interaction terms are calculated following the methodology of Norton *et al.* (2004) by taking the discrete difference between our dummy values. All regressions are estimated with robust standard errors, clustered at the bank level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

TABLE 8 Robustness Check – *DivEq*: Listed banks

	Tobit No FE PreCrisis 1 *DivEq*	OLS FE PreCrisis 2 *DivEq*	Tobit FE PreCrisis 3 *DivEq*	Tobit No FE Crisis 4 *DivEq*	OLS FE Crisis 5 *DivEq*	Tobit FE Crisis 6 *DivEq*	Tobit No FE PostCrisis 7 *DivEq*	OLS FE PostCrisis 8 *DivEq*	Tobit FE PostCrisis 9 *DivEq*
SND	−0.373	4.050**	4.100**	0.607	0.767	0.236	−0.399	0.0395	0.198
	(0.689)	(1.581)	(1.729)	(0.755)	(1.056)	(1.031)	(0.620)	(0.688)	(0.874)
	[−0.18335]		[2.469]	[0.29988]		[0.0257]	[−0.26945]		[0.00627]
RiskH SubDebt*	0.813	0.552	0.540	−0.616	0.624	−1.916	−1.683	−1.093	−1.917
	(1.371)	(0.890)	(0.971)	(1.692)	(1.099)	(1.839)	(2.125)	(1.027)	(1.616)
	[0.50327]		[0.164837]	[−0.33211		[−1.11571]	[−0.4669]		[−0.77541]
InDeposit	0.101***	−0.0761	−0.0854	0.0550**	−0.00143	0.0317	0.0397*	0.000895	−0.0194
	(0.0231)	(0.0649)	(0.0789)	(0.0267)	(0.0325)	(0.0410)	(0.0225)	(0.0174)	(0.0343)
	[0.06066]		[−0.0529]	[0.02775]		[0.0115]	[0.01622]		[−0.00724]
RiskH InDeposit*	−0.0424	−0.0279	-0.0364	−0.0443	−0.00383	-0.0548	−0.0652	−0.0186	0.00353
	(0.0740)	(0.0322)	(0.0438)	(0.0456)	(0.0365)	(0.0474)	(0.0820)	(0.0440)	(0.0639)
	[−0.027429]		[−0.017623]	[−0.022994]		[-0.027168]	[−0.028148]		[0.000873]
UnDeposit	−0.0148	0.0460	0.114**	0.0328	0.0183	0.0497	−0.0186	0.0358	0.0790
	(0.0293)	(0.0444)	(0.0541)	(0.0311)	(0.0388)	(0.0487)	(0.0322)	(0.0388)	(0.0601)
	[−0.00146]		[0.0692]	[0.01289]		[0.00903]	[−0.010393]		[0.0317]
RiskH UnDeposit*	0.127***	0.00618	0.0211	−0.0991	-0.113	−0.312***	−0.0304	0.0588	0.0450
	(0.0354)	(0.0226)	(0.0477)	(0.114)	(0.0764)	(0.0989)	(0.132)	(0.0790)	(0.115)
	[0.077987]		[0.007984]	[-0.058312]		[−0.179697]	[−0.00636]		[0.020657]
MBV	−0.118***	-0.155	−0.168	−0.00831	0.0117	-0.122***	−0.00117	−0.00128	1.44e−05
	(0.0452)	(0.127)	(0.123)	(0.00849)	(0.0121)	(0.0360)	(0.00429)	(0.00422)	(0.00433)
	[−0.073924]		[−0.100]	[−0.004527]		[−0.0529]	[−0.000565]		[0.00001]
DivPremium	−0.406	−0.595	0.340	−5.905***	−4.793**	−7.256***	2.168***	2.060***	2.455***
	(0.351)	(0.390)	(0.354)	(1.866)	(1.956)	(2.397)	(0.394)	(0.368)	(0.537)
	[−0.253801]		[0.202]	[−3.21724]		[−3.135]	[1.04755]		[0.935]

(Continues)

TABLE 8 (Continued)

	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE
	PreCrisis	PreCrisis	PreCrisis	Crisis	Crisis	Crisis	PostCrisis	PostCrisis	PostCrisis
	1	2	3	4	5	6	7	8	9
	DivEq	*DivEq*	*DivEq*	*DivEq*	*DivEq*	*DivEq*	*DivEq*	*DivEq*	*DivEq*
Observations	1,174	1,174	1,174	1,258	1,258	1,258	1,927	1,927	1,927
Bank FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R−squared		0.707			0.620			0.513	

Note: The table displays our robustness check results of the impact of bank debt on dividend payouts for publicly listed banks during the pre−crisis period (2004Q1-2006Q4), the crisis period (2007Q1-2009Q4), and postcrisis period (2010Q1-2015Q4). The dependent variable is the dividend-to-equity ratio (*DivEq*). See Table 1 for variable definitions. Columns 1–3 show the results for the pre-crisis period, Columns 4–6 show the results for the crisis period, and Column 7–9 show the result for the post-crisis period. For each variable, the first row shows regression coefficient, second row shows standard error, and third row shows marginal effect. The marginal effects for our interaction terms are calculated following the methodology of Norton *et al.* (2004) by taking the discrete difference between our dummy values. All regressions are estimated with robust standard errors, clustered at the bank level. *** p<0.01, ** p<0.05, * p<0.1.

it still does not need to have an integer dependent variable for the estimator to be consistent. Indeed, econometricians provide suggestive simulation evidence that strongly support the use of Poisson in continuous censored dependent variable (e.g., Gourieroux et al., 1984; Wooldridge, 2010; Silva and Tenreyro, 2011). Hence, we run our key regressions (all banks, unlisted banks, and PLC banks) using the Poisson regression model using robust standard error and report the results in Table 9. Overall, our results are highly similar to our main results and lend strong support to our key conclusions for all specifications (all banks, unlisted banks, PLC banks).

5.2 | Sample split

The main regressions group our risky banks together and low-to-medium risk banks together using a dummy variable for risky banks. This approach facilitates drawing general conclusions about the role of bank debts across banks facing extreme solvency situations and the average banks, while minimising the impact of the idiosyncratic circumstances surrounding a particular group of banks. This is useful because it helps us generate a comprehensive picture of specific types of banks. There is also a key advantage for looking at each group of banks solely as it permits a more granular look at how the role of bank debt is affected by the specific circumstances of each group of banks. That is, there is value in also understanding if the role of bank debt is influenced by the details of a given group of banks, including the extent of government intervention. For example, each group of banks has features that it shares with the other group of banks but also features that were peculiar to that group. Risky banks facing extreme credit situations are normally low capitalised banks and have lower charter value relative to solvent banks. Therefore, the dividend policy determinants for each group are shaped by differences in the level of capitalisation and solvency among other factors. Hence, we rerun the main regressions separately for each group of banks and exclude the risky banks dummy.

Tables 101112 contain the main results based on each group of banks. Our results are qualitatively similar to the main results, whilst providing further support to our hypotheses through extra channels. That is, for unlisted banks, insured deposits explain larger dividends for low-to-medium risk banks before and during the crisis periods (i.e., insured deposits become significant), providing evidence in favour of the *signalling hypothesis* through the insured deposits channel. In addition, uninsured deposits significantly reduce dividend payments during the crisis period for unlisted banks facing high risk of failure (i.e., uninsured deposits become significant), lending further support to the monitoring hypothesis for unlisted banks through the uninsured deposits channel (alongside the insured deposits channel). For PLC banks, on the other hand, our results are also qualitatively similar to the main results, albeit some coefficients are not always statistically significant. Interestingly, however, our results show that in the post-crisis period risky banks holding high amounts of uninsured deposits distribute large dividends, providing evidence in favour of the *risk-shifting hypothesis*.

6 | CONCLUSIONS

Bank debt plays a vital role in bank dividend policy and can be even more influential during crises, when debtholders may suffer from wealth expropriation via dividend payments. We construct a sample of 7147 US banks using quarterly observations between 2004–2014 to examine how bank deposits and subordinated debt affect dividend policy over three periods (i.e., pre-crisis period 2004Q1-2006Q4, crisis period 2007Q1-2009Q4, post-crisis period 2010Q1-2014Q4). Our results show that the *monitoring hypothesis*, under which bank debtholders prohibit risky bank managers from paying dividends, holds mainly via the deposits channel. Moreover, the *signalling hypothesis* holds for unlisted banks at all times with a time-varying channel, whereas for PLC banks it holds only during the pre-crisis period. Finally, the individual group regressions yield additional insights for the *risk-shifting hypothesis* for PLC banks, as it holds in the post-crisis period through the uninsured deposits channel. The results are robust to a battery of tests to identify the role of debt seniority on bank dividend policy.

TABLE 9 Extra analysis: Poisson regression model

	All Banks	All Banks	All Banks	Unlisted Banks	Unlisted Banks	Unlisted Banks	PLC Banks	PLC Banks	PLC Banks
	PreCrisis	Crisis	Post-Crisis	PreCrisis	Crisis	Post-Crisis	PreCrisis	Crisis	Post-Crisis
	1	2	3	4	5	6	7	8	9
	DivAs	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*
SND	0.481***	0.0270	-0.258**	0.445***	0.00580	-0.420***	0.635***	0.0815	0.346
	(0.138)	(0.102)	(0.132)	(0.160)	(0.115)	(0.163)	(0.233)	(0.264)	(0.275)
*RiskH*SND*	-0.0403	0.167	-0.337	-0.0385	0.0533	-0.200	0.0146	-0.727	-0.378
	(0.0895)	(0.125)	(0.296)	(0.0980)	(0.134)	(0.253)	(0.122)	(0.504)	(0.350)
InDeposit	0.00121	-0.000437	0.00229	0.000982	-0.000435	0.000794	-0.0113	-0.00305	0.00669
	(0.00167)	(0.00149)	(0.00187)	(0.00171)	(0.00151)	(0.00184)	(0.0144)	(0.0129)	(0.00943)
RiskH InDeposit*	-0.00122	-0.00882***	-0.00540**	-0.00132	-0.00863***	-0.00618**	-0.00262	-0.0263**	0.0122
	(0.00138)	(0.00210)	(0.00263)	(0.00141)	(0.00213)	(0.00260)	(0.00542)	(0.0110)	(0.0247)
UnDeposit	0.00778***	-0.00145	0.00686**	0.00762***	-0.00156	0.00758**	0.00918	0.0136	0.0421**
	(0.00279)	(0.00310)	(0.00312)	(0.00287)	(0.00322)	(0.00306)	(0.00904)	(0.0118)	(0.0185)
RiskH UnDeposit*	-0.00199	0.00430	0.00397	-0.00167	0.00491	0.00437*	0.00894	-0.0566***	0.0247
	(0.00219)	(0.00380)	(0.00267)	(0.00234)	(0.00411)	(0.00265)	(0.00899)	(0.0177)	(0.0408)
MBV							-0.0215	-0.00751	0.000107
							(0.0276)	(0.00948)	(0.000560)
DivPremium							-0.0652	-2.489***	1.070***
							(0.0701)	(0.711)	(0.150)
Observations	68,371	72,644	106,995	67,197	71,386	105,068	1,174	1,258	1,927
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The table displays our extra analysis results for Poisson regression model for all banks, unlisted banks, and PLC banks during the pre-crisis period (2004Q1-2006Q4), the crisis period (2007Q1-2009Q4), and post-crisis period (2010Q1-2015Q4). The dependent variable is the dividend-to-asset ratio (*DivAs*). See Table 1 for variable definitions. Columns 1–3 display the results for all banks, Columns 4–6 display the results for unlisted banks, and Columns 7–9 display the results for PLC banks. For brevity, regression results for our key variables of interest are reported. All regressions are estimated with robust standard errors, clustered at the bank level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

TABLE 10 Additional analysis: sample split - All banks

Panel A: Regression results for high-risk banks - All banks									
	Tobit No Fe	OLS FE	Tobit FE	Tobit No Fe	OLS FE	Tobit FE	Tobit No Fe	OLS FE	Tobit FE
	High-risk	High-risk	High-risk	High-risk	High-risk	High-risk	High-risk	High-risk	High-risk
	Pre-Crisis	Pre-Crisis	Pre-Crisis	Crisis	Crisis	Crisis	PostCrisis	PostCrisis	PostCrisis
	1	2	3	4	5	6	7	8	9
	DivAs	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*
SND	0.0212	0.158	0.128	−0.0446	−0.0595	−0.104	−0.137	0.00331	−0.166
	(0.0537)	(0.165)	(0.115)	(0.0905)	(0.0900)	(0.248)	(0.172)	(0.0271)	(0.333)
	[0.0111]		[0.0522]	[−0.01183]		[−0.0078]	[−0.01932]		[−0.0053]
lnDeposit	0.00543***	−0.00115	−0.000282	0.00148	−0.000576	−0.00935***	−0.00521**	−0.000957	−0.00522
	(0.00140)	(0.00165)	(0.00227)	(0.00168)	(0.00119)	(0.00280)	(0.00244)	(0.00106)	(0.00459)
	[0.00284]		[−0.00012]	[0.0004]		[−0.0007]	[−0.0007]		[−0.00017]
UnDeposit	0.00132	−0.000764	−0.000828	−0.000783	−0.00608**	−0.0105**	−0.000617	0.00114	−0.000372
	(0.00221)	(0.00286)	(0.00315)	(0.00260)	(0.00258)	(0.00458)	(0.00368)	(0.00204)	(0.00645)
	[0.0007]		[−0.00034]	[−0.00021]		[−0.00079]	[−0.00009]		[−0.000012]
Observations	6,814	6,814	6,814	7,188	7,188	7,188	10,647	10,647	10,647
Bank FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared		0.824			0.812			0.774	

(Continues)

TABLE 10 (Continued)

Panel B: Regression results for low-to-medium risk banks - All banks									
	Tobit No Fe	OLS FE	Tobit FE	Tobit No Fe	OLS FE	Tobit FE	Tobit No Fe	OLS FE	Tobit FE
	Low-to-Medium	Low-to-Medium	Low-to-Medium	Low-to-Medium	Low-to-Medium	Low-to-Medium	Low-to-Medium	Low-to-Medium	Low-to-Medium
	Pre-Crisis	Pre-Crisis	Pre-Crisis	Crisis	Crisis	Crisis	PostCrisis	PostCrisis	PostCrisis
	1	2	3	4	5	6	7	8	9
	DivAs	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*
SND	−0.0103	0.126***	0.225***	−0.0159	0.0466**	0.0467	−0.0523*	−0.0233	−0.116**
	(0.0298)	(0.0476)	(0.0742)	(0.0254)	(0.0236)	(0.0434)	(0.0311)	(0.0271)	(0.0452)
	[−0.00454]		[0.0685]	[−0.00674]		[0.0127]	[−0.0216]		[0.0297]
lnDeposit	0.00886***	−0.000161	0.00190**	0.00638***	0.000794**	0.00231***	0.00340***	0.000359	0.000829
	(0.000497)	(0.000674)	(0.000957)	(0.000427)	(0.000362)	(0.000665)	(0.000432)	(0.000453)	(0.000777)
	[0.00389]		[0.00058]	[0.00271]		[0.00063]	[0.0014]		[0.0002]
UnDeposit	−0.00320***	0.00135*	0.00710***	0.000313	−0.000330	0.00384***	0.000640	0.00303***	0.00612***
	(0.000823)	(0.000813)	(0.00151)	(0.000718)	(0.000616)	(0.00131)	(0.000943)	(0.000778)	(0.00123)
	[−0.00141]		[0.0022]	[0.00013]		[0.0011]	[0.0003]		[0.0016]
Observations	61,557	61,557	61,557	65,456	65,456	65,456	96,348	96,348	96,348
Bank FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared		0.690			0.694			0.668	

Note: The table displays our additional analysis results for splitting our all-banks sample into risky banks and average banks. For each variable, the first row shows regression coefficient, second row shows standard error, and third row shows marginal effect. For brevity, regression results for our key variables of interest are reported. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

TABLE 11 Additional analysis: sample split – Unlisted banks

Panel A: Regression results for high-risk banks - Unlisted banks									
	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE
	High-risk	High-risk	High-risk	High-risk	High-risk	High-risk	High-risk	High-risk	High-risk
	Pre-Crisis	Pre-Crisis	Pre-Crisis	Crisis	Crisis	Crisis	PostCrisis	PostCrisis	PostCrisis
	1	2	3	4	5	6	7	8	9
	DivAs	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*
SND	0.0120	0.165	0.142	-0.0817	0.00183	0.133	-0.0954	0.0131	−0.0496
	(0.0555)	(0.162)	(0.116)	(0.0947)	(0.0550)	(0.156)	(0.182)	(0.0229)	(0.315)
	[0.0063]		[0.0584]	[−0.0216]		[0.0099]	[−0.0133]		[−0.0015]
lnDeposit	0.00507***	−0.00129	−0.000997	0.00135	−0.000712	−0.00980***	−0.00508**	−0.000776	−0.00509
	(0.00139)	(0.00165)	(0.00228)	(0.00172)	(0.00119)	(0.00283)	(0.00247)	(0.00105)	(0.00465)
	[0.0027]		[−0.00041]	[0.0004]		[−0.00073]	[−0.00071]		[−0.00016]
UnDeposit	0.00117	−0.00101	−0.00128	−0.000795	−0.00661**	−0.0116***	−0.000501	0.000350	−0.00171
	(0.00228)	(0.00284)	(0.00304)	(0.00267)	(0.00262)	(0.00450)	(0.00374)	(0.00189)	(0.00622)
	[0.0006]		[−0.00053]	[−0.00021]		[−0.00086]	[−0.00007]		[−0.00005]
Observations	6,751	6,751	6,751	7,077	7,077	7,077	10,485	10,485	10,485
Bank FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared		0.824			0.815			0.781	

(Continues)

TABLE 11 (Continued)

Panel B: Regression results for low-to-medium risk banks - Unlisted banks									
	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE
	Low-to-Medium	Low-to-Medium	Low-to-Medium	Low-to-Medium	Low-to-Medium	Low-to-Medium	Low-to-Medium	Low-to-Medium	Low-to-Medium
	Pre-Crisis	Pre-Crisis	Pre-Crisis	Crisis	Crisis	Crisis	PostCrisis	PostCrisis	PostCrisis
	1	2	3	4	5	6	7	8	9
	DivAs	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*
SND	−0.0270	0.0937*	0.188**	−0.0455	0.0284	0.0314	−0.115***	−0.0341	−0.149***
	(0.0334)	(0.0487)	(0.0817)	(0.0282)	(0.0194)	(0.0429)	(0.0357)	(0.0270)	(0.0508)
	[−0.01176]		[0.0565]	[−0.01923]		[0.0085]	[−0.0474]		[−0.0376]
lnDeposit	0.00871***	−0.000191	0.00186*	0.00620***	0.000804**	0.00223***	0.00314***	1.30e−05	0.000372
	(0.000508)	(0.000682)	(0.000986)	(0.000433)	(0.000362)	(0.000678)	(0.000440)	(0.000442)	(0.000763)
	[0.0038]		[0.00056]	[0.00262]		[0.0006]	[0.0013]		[0.00009]
UnDeposit	−0.00318***	0.00156*	0.00708***	1.40e−05	−9.31e−05	0.00386***	0.000184	0.00254***	0.00582***
	(0.000844)	(0.000837)	(0.00153)	(0.000728)	(0.000622)	(0.00133)	(0.000957)	(0.000755)	(0.00122)
	[−0.00139]		[0.0021	[0.00000]		[0.001]	[0.0001]		[0.0015]
Observations	60,446	60,446	60,446	64,309	64,309	64,309	94,583	94,583	94,583
Bank FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared		0.690			0.695			0.669	

Note: The table displays our additional analysis results for splitting our unlisted banks sample into risky banks and average banks. For each variable, the first row shows regression coefficient, second row shows standard error, and third row shows marginal effect. For brevity, regression results for our key variables of interest are reported. *** p<0.01, ** p<0.05, * p<0.1.

TABLE 12 Additional analysis: sample split - PLC banks

Panel A: Regression results for high-risk banks - PLC banks									
	Tobit No FE	OLS FE	Tobit No FE	Tobit No FE	OLS FE	Tobit No FE	Tobit No FE	OLS FE	Tobit No FE
	High-risk	High-risk	High-risk	High-risk	High-risk	High-risk	High-risk	High-risk	High-risk
	Pre-Crisis	Pre-Crisis	Pre-Crisis	Crisis	Crisis	Crisis	PostCrisis	PostCrisis	PostCrisis
	1	2	3	4	5	6	7	8	9
	DivAs	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*
SND	−0.413**	0.336	0.671**	−0.0961	−0.657	−0.771***	−0.352	−0.00870	0.198
	(0.192)	(0.426)	(0.328)	(0.117)	(0.487)	(0.245)	(0.538)	(0.258)	(0.233)
	[−0.1761]		[0.2127]	[−0.0358]		[−0.2449]	[−0.0774]		[0.0084]
InDeposit	0.0107	−0.00177	0.0137	0.00707	0.00338	0.0214***	0.00377	−0.00105	0.0478
	(0.00893)	(0.0177)	(0.0208)	(0.00463)	(0.00750)	(0.00694)	(0.0108)	(0.0144)	(0.0397)
	[0.0046]		[0.00434]	[0.0026]		[0.00679]	[0.00083]		[0.00202]
UnDeposit	0.0160***	−0.00333	−0.00826	−0.00587	−0.00454	−0.0481**	−0.00119	0.106***	0.219***
	(0.00569)	(0.0221)	(0.0173)	(0.00712)	(0.0106)	(0.0186)	(0.0278)	(0.0208)	(0.0655)
	[0.0068]		[−0.00262	[−0.0022]		[−0.01529]	[−0.00026]		[0.00923]
Observations	117	117	117	113	113	113	193	193	193
Bank FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
		0.817			0.941			0.742	

(Continues)

TABLE 12 (Continued)

Panel B: Regression results for low-to-medium risk *banks - PLC banks*									
	Tobit No FE	OLS FE	Tobit No FE	Tobit No FE	OLS FE	Tobit No FE	Tobit No FE	OLS FE	Tobit No FE
	Low-to-Medium	Low-to-Medium	Low-to-Medium	Low-to-Medium	Low-to-Medium	Low-to-Medium	Low-to-Medium	Low-to-Medium	Low-to-Medium
	Pre-Crisis	Pre-Crisis	Pre-Crisis	Crisis	Crisis	Crisis	PostCrisis	PostCrisis	PostCrisis
	1	2	3	4	5	6	7	8	9
	DivAs	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*
SND	−0.0448	0.415***	0.394***	0.0242	0.188	0.0889	0.0738	0.111	0.0876
	(0.0562)	(0.132)	(0.135)	(0.0723)	(0.184)	(0.149)	(0.0549)	(0.0917)	(0.0981)
	[−0.0296]		[0.2492]	[0.0137]		[0.04461]	[0.0394]		[0.04084]
InDeposit	0.00932***	−0.00438	−0.00445	0.00581**	0.000594	0.00391	0.00641***	0.00449	0.00491
	(0.00211)	(0.00448)	(0.00528)	(0.00283)	(0.00378)	(0.00558)	(0.00232)	(0.00276)	(0.00505)
	[0.0061]		[−0.00282]	[0.0033]		[0.00196]	[0.0034]		[0.00229]
UnDeposit	−0.00323	0.00526	0.0128**	0.00378	0.00161	0.000264	0.00484	0.0114	0.0150
	(0.00294)	(0.00459)	(0.00618)	(0.00268)	(0.00409)	(0.00485)	(0.00351)	(0.00820)	(0.0109)
	[−0.00213]		[0.0081]	[0.00214]		[0.00013]	[0.0026]		[0.00702]
Observations	1,057	1,057	1,057	1,145	1,145	1,145	1,734	1,734	1,734
Bank FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared		0.723			0.665			0.649	

Note: The table displays our additional analysis results for splitting our listed banks sample into risky banks and average banks. For each variable, the first row shows regression coefficient, second row shows standard error, and third row shows marginal effect. For brevity, regression results for our key variables of interest are reported. *** p<0.01, ** p<0.05, * p<0.1.

Our findings shed light on the economic role of bank debtholders on payout policy and how they behave differently across each other during normal times and crises. From a policy perspective, we show that while subordinated debt can be anticipated to affect bank managers' decisions with regards to dividend policy, senior debt (i.e., deposits) tends to play a much more significant role, underlining the prominent role of senior debt in the capital structure of banks. Most notably, we show that depositors of unlisted banks are a key discipline device as they are always keen to deal with a financially stable bank. Therefore, distributing dividends when the risk of default is high would induce these depositors to review their relationship with the bank during normal times and crises. Another key implication is that unlisted banks use dividends to signal mainly to depositors with no influence for subordinated debt. Taken together, our findings are important for regulators as they are suggestive of strengthened discipline and risk-shifting behaviour, on the one hand, and increased signalling incentive on the other hand, through three time-varying debt channels based on the macroeconomic conditions.

Future studies on the economic role of dividend policy ought to account for the debt components, since the strength of debtholders, both senior and subordinate, affects dividend policy and since their ability to strengthen market discipline may be greater than that for shareholders. Overall, our findings advise against a one-size-fits-all approach to regulate banks since the market discipline is different across the different types of banks and different times.

ACKNOWLEDGEMENT

We would like to thank the anonymous referee, Benjamin Guin, Elena Loutskina, Bruce Morley, Enrico Onali, Matthew Willison, Jeffrey Wooldridge, and the participants at the Research Seminars in the University of Exeter and Loughborough University for their very helpful comments and suggestions.

DECLARATIONS OF INTEREST

None.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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ENDNOTES

[1] In theory, risk-shifting favours equity holders over debtholders due to the convex claims equity holders hold over the bank assets; in contrast, debtholders have concave payoffs because they have limited upside potential in the value of their claims (Jensen and Meckling, 1976). This means that shareholders benefit from bank default risk at the expense of debtholders and the government guarantors, but not vice versa.

[2] There has been a shift in priority structure between the different classes of claimants in the U.S. as a result of Depositor Preference Laws (DPLs). That is, uninsured depositors are now ahead of general creditors (non-depositors), which increases the likelihood (and amount) of losses for non-depositors in the event of a bank's liquidation, whilst also providing them an additional incentive to strengthen their monitoring of banks (Danisewicz et al., 2018).

[3] A switching cost in the deposit market would include the time involved in opening a new account, closing an existing account, and learning new procedures and office locations. On average, switching costs could reach up to 11% of the amount of deposits maintained with the bank. In a survey examining depositors' behaviour, 32% of the respondents state that they never switched their banks (see Niu, 2008 for further details).

[4] In October 2008 the Federal Deposit Insurance Corporation (FDIC) increased the deposit insurance cap from $100k to $250k (Kanas, 2013).

[5] Such characteristics have prompted some economists to draft proposals that require banks to issue a minimum amount of subordinated debt to strengthen market discipline (e.g., Niu, 2008; Chen and Hasan, 2011; Schaeck *et al.*, 2012; Nguyen, 2013). Banks would be subject to direct and indirect market discipline. Specifically, they might be subject to direct discipline through an increased monitoring from investors and the rising cost of issuing subordinated debt when a bank's perceived risk increases. Alternatively, supervisors can impose indirect market discipline by monitoring the debt price and yield as a

means of triggering regulatory actions such as restricting banks activity, cutting dividends (or raising capital requirements), or conducting frequent on-site inspections (Nguyen, 2013).

[6] Note that following the 1988 Basel Accord, banks have standardised subordinated debt contracts, and debt qualifying as Tier 2 capital (i.e., subordinated debt) cannot be redeemed without FDIC approval. Accordingly, banks issuing subordinated debt became less likely to include covenants that accelerate principal repayment. Consequently, the relationship between the bank's financial health (or charter value) and its contract restrictiveness has weakened (Goyal, 2005).

[7] Previous literature shows that the crisis began in the US in the third quarter of 2007 when the asset-backed commercial paper (ABCP) market deteriorated and ended in the second quarter of 2009 (Ivashina and Scharfstein, 2010). Nonetheless, the present study is guided by Abreu and Gulamhussen (2013) among others in specifying the crisis period 2007-2009.

[8] Note that a risk-shifting behaviour would trigger an agency cost problem for governments since they act as agents for their citizens, which means that the legal protection plays a key role on the risk-shifting behaviour. This is because governments would induce risky banks to boost their capital by limiting dividends and retaining earnings (Duqi *et al.*, 2020).

[9] It is important to note that banks may also use share repurchases for signalling and to supplement dividends. However, since share repurchases are less likely to be an ongoing commitment, unlike ordinary dividends, they may not have the same signalling content of dividends (Allen *et al.*, 2012).

[10] It is important to note that while some studies in the literature exclude banks with negative equity, we believe that it is very important to keep such banks in the sample to test our key hypotheses. We reran our models after excluding these banks and find that the results are very similar to our main results (results available upon request).

[11] As a robustness test, since subordinated debt is classified as bank capital under Tier 2 capital, we rescale it by the bank risk-weighted asset to check whether this impact our results.

[12] We also used equity-to-asset ratio as our capital ratio in unreported tests and our results remain unchanged.

[13] During this period, for a bank to be just adequately capitalised, its Tier 1 ratio must be at least 4%, whereas the total capital ratio, CAR, must be higher than or equal 8%. In our study, the choice of adding 2% to each of these ratios to deem the bank adequately capitalised is because banks normally start to adjust their capital before they hit the regulatory threshold due to the pressure imposed on bank managers.

[14] For banks that were consolidated at the BHC level, we tried to have the dummy *Pressure* takes the value one if any of the BHC's subsidiaries' capital ratios is below our thresholds (i.e., 6% for Tier 1 ratio and 10% for CAR) and the results remain unchanged.

[15] In unreported test, we replaced our *ZScore* by the risk-weighted assets to total assets ratio (*RWATA*) as a risk variable and the results remain unchanged.

[16] Note that *ZScore* is computed using the standard deviation of the *ROA* calculated on a rolling-window of four quarters. Also, it is worth mentioning that employing different rolling windows (i.e., up to 10 rolling windows) showed no significant impact on our results.

[17] Extreme values/outliers were observed in the following variables: *DivAs*, *DivEq*, *SND*, *AGrowth*, *ROA*, *InDeposit*, *UnDeposit*, *CAP, ZScore, RETE, MBV, and DivPremium*.

[18] It is worth mentioning that when the sample size is adequately large, OLS may still be employed for censored dependent variables to increase confidence as the estimates tend to be pulled towards the population average and away from problematic extreme ranges. Therefore, ignoring the statistical significance, as the standard errors estimated are the key problem here, allows us to run regression diagnostic on OLS as a further proof.

[19] Using the U.S. Treasury website, we obtain information on the TARP bailouts. We match the legal name and location the banks in our sample with their corresponding RSSD9001 (Call Report ID) in the U.S. Treasury list.

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How to cite this article: Alhalabi, T., Castro, V., & Wood, J. (2023). Bank dividend payout policy and debt seniority: Evidence from US Banks. *Financial Markets, Institutions & Instruments*, 1–56. https://doi.org/10.1111/fmii.12183

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TABLE A1 Robustness Check – *SND* scaled by RWA: All Banks

	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE
	PreCrisis	PreCrisis	PreCrisis	Crisis	Crisis	Crisis	PostCrisis	PostCrisis	PostCrisis
	1	2	3	4	5	6	7	8	9
	DivAs	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*
SND	−0.00355	0.0943***	0.172***	−0.0189	0.0195	0.0206	−0.0375	−0.0226	−0.0749**
	(0.0228)	(0.0355)	(0.0562)	(0.0200)	(0.0200)	(0.0368)	(0.0229)	(0.0183)	(0.0354)
	[−0.0024641]		[0.0531]	[−0.007511]		[0.00680]	[−0.0171]		[−0.0175]
*RiskH*SND*	−0.0197	0.0525	0.00108	0.00334	0.0661***	0.0851*	−0.0903	−0.00487	−0.183***
	(0.0368)	(0.0324)	(0.0390)	(0.0541)	(0.0251)	(0.0480)	(0.0817)	(0.0196)	(0.0636)
	[−0.010334]		[0.0562]	[0.0012994]		[0.0368]	[−0.019098]]		[0.0354]
InDeposit	0.00870***	−0.000644	0.00132	0.00620***	3.48e−05	0.000468	0.00325***	0.000443	0.000733
	(0.000500)	(0.000620)	(0.000965)	(0.000437)	(0.000349)	(0.000683)	(0.000447)	(0.000517)	(0.000895)
	[0.003795]		[0.000358]	[0.00237]		[0.00006]	[0.001241]		[0.00007]
RiskH InDeposit*	−0.00205*	0.000450	−0.00165*	−0.00338***	0.000229	−0.00219**	−0.00645***	−8.05e−05	−0.00362**
	(0.00115)	(0.000648)	(0.000970)	(0.00113)	(0.000430)	(0.000972)	(0.00165)	(0.000549)	(0.00146)
	[−0.00043]		[−0.000513]	[−0.00136]		[−0.00048]	[−0.00214]		[−0.00065]
UnDeposit	−0.00299***	0.000723	0.00666***	−0.000308	−0.00136**	0.000302	1.92e−05	0.00273***	0.00559***
	(0.000857)	(0.000823)	(0.00146)	(0.000766)	(0.000639)	(0.00148)	(0.000975)	(0.000860)	(0.00143)
	[−0.001209]		[0.00197]	[−0.000137]		[0.000048]	[0–.00002]		[0.0011]
RiskH UnDeposit*	0.00287	−0.000944	−0.00281	−0.000305	−0.000927	−0.001000	−0.000692	−0.00183*	0.000357
	(0.00185)	(0.00107)	(0.00197)	(0.00230)	(0.00111)	(0.00243)	(0.00243)	(0.000982)	(0.00205)
	[0.0012542]		[−0.00078]	[−0.0001251]		[−0.000222]	[−0.000193]		[−0.00011]
Observations	68,371	68,371	68,371	72,644	72,644	72,644	106,995	106,995	106,995
Bank FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared		0.710			0.683			0.652	

Note: The table displays our robustness check results of the impact of bank debt on dividend payouts for all banks during the pre-crisis period (2004Q1-2006Q4), the crisis period (2007Q1-2009Q4), and postcrisis period (2010Q1-2015Q4). The dependent variable is the dividend-to-equity ratio (*DivEq*) and subordinated debt is scaled by risk-weighted assets (RWA). See Table 1 for variable definitions. For each variable, the first row shows regression coefficient, second row shows standard error, and third row shows marginal effect. The marginal effects for our interaction terms are calculated following the methodology of Norton et al. (2004) by taking the discrete difference between our dummy values. All regressions are estimated with robust standard errors, clustered at the bank level. *** p<0.01, ** p<0.05, * p<0.1.

TABLE A2 Robustness Check – SND scaled by RWA: Unlisted Banks

	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE
	PreCrisis	PreCrisis	PreCrisis	Crisis	Crisis	Crisis	PostCrisis	PostCrisis	PostCrisis
	1	2	3	4	5	6	7	8	9
	DivAs	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*
SND	−0.0165	0.0734**	0.151**	−0.0418*	0.00519	0.00880	−0.0791***	−0.0201	−0.0869**
	(0.0255)	(0.0359)	(0.0612)	(0.0226)	(0.0164)	(0.0354)	(0.0264)	(0.0181)	(0.0388)
	[−0.00752]		[0.0458]	[−0.01704]		[0.00298]	[−0.02971]		[−0.0184]
*RiskH*SND*	−0.00436	0.0552	−0.00399	−0.00680	0.0433*	0.0411	−0.0280	0.0179	−0.105
	(0.0407)	(0.0341)	(0.0420)	(0.0543)	(0.0221)	(0.0480)	(0.0876)	(0.0186)	(0.0656)
	[−0.003398		[0.00171]	[−0.002849]		[0.00854]	[0.001853]		[−0.0041]
InDeposit	0.00854***	−0.000673	0.00116	0.00602***	3.45e−05	0.000435	0.00300***	9.55e−05	0.000242
	(0.000510)	(0.000629)	(0.000992)	(0.000443)	(0.000350)	(0.000691)	(0.000456)	(0.000513)	(0.000893)
	[0.003696]		[0.000301]	[0.00229]		[0.0000524]	[0.000864]		[−0.00003]
RiskH InDeposit*	−0.00219*	0.000403	−0.00172*	−0.00324***	0.000202	−0.00211**	−0.00623***	−0.000171	−0.00389***
	(0.00115)	(0.000655)	(0.000980)	(0.00114)	(0.000432)	(0.000993)	(0.00168)	(0.000538)	(0.00146)
	[−0.00051]		[−0.00053]	[−0.001294]		[−0.00046]	[−0.001972]		[−0.00063]
UnDeposit	−0.00298***	0.000916	0.00656***	−0.000501	−0.00126*	0.000136	−0.000351	0.00204**	0.00532***
	(0.000878)	(0.000846)	(0.00149)	(0.000785)	(0.000663)	(0.00152)	(0.000995)	(0.000870)	(0.00148)
	[−0.0012]		0.00192	[−0.00022]		0.0000194	[−0.00016]		0.00101
RiskH UnDeposit*	0.00280	−0.000694	−0.00240	−0.000361	−0.000640	−0.000530	−0.000814	−0.00178*	0.000280
	(0.00186)	(0.00109)	(0.00205)	(0.00232)	(0.00113)	(0.00250)	(0.00244)	(0.000993)	(0.00206)
	[0.001211]		[−0.00064]	[−0.00015]		[−0.00012]	[−0.000172]		[−0.00011]

(Continues)

TABLE A2 (Continued)

	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE
	PreCrisis	PreCrisis	PreCrisis	Crisis	Crisis	Crisis	PostCrisis	PostCrisis	PostCrisis
	1	2	3	4	5	6	7	8	9
	DivAs	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*
Observations	67,197	67,197	67,197	71,386	71,386	71,386	105,068	105,068	105,068
Bank FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared		0.710			0.685			0.654	

Note: The table displays our robustness check results of the impact of bank debt on dividend payouts for unlisted banks during the pre-crisis period (2004Q1-2006Q4), the crisis period (2007Q1- 2009Q4), and postcrisis period (2010Q1-2015Q4). The dependent variable is the dividend-to-equity ratio (*DivEq*) and subordinated debt is scaled by risk-weighted assets (RWA). See Table 1 for variable definitions. For each variable, the first row shows regression coefficient, second row shows standard error, and third row shows marginal effect. The marginal effects for our interaction terms are calculated following the methodology of Norton et al. (2004) by taking the discrete difference between our dummy values. All regressions are estimated with robust standard errors, clustered at the bank level. *** p<0.01, ** p<0.05, * p<0.1.

TABLE A3 Robustness Check – SND scaled by RWA: PLC Banks

	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE
	PreCrisis	PreCrisis	PreCrisis	Crisis	Crisis	Crisis	PostCrisis	PostCrisis	PostCrisis
	1	2	3	4	5	6	7	8	9
	DivAs	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*
SND	−0.0662	0.268**	0.245**	0.0139	0.0670	0.0313	0.0429	0.0603	0.0702
	(0.0502)	(0.109)	(0.111)	(0.0571)	(0.111)	(0.105)	(0.0374)	(0.0846)	(0.0998)
	[−0.03851]		0.141	[0.00769]		0.0108	[0.01835]		0.0221
*RiskH*SND*	0.0464	0.0246	0.0195	0.00395	0.140	−0.0543	−0.0513	−0.0725	−0.123
	(0.0966)	(0.0613)	(0.0672)	(0.164)	(0.0873)	(0.155)	(0.217)	(0.117)	(0.157)
	[0.03028]		−0.004746	[0.0047]		−0.04621	[−0.024232]		−0.064122
wInDeposit	0.00989***	−0.00428	−0.00351	0.00489	−0.000320	0.00261	0.00717***	0.00631*	0.00842
	(0.00222)	(0.00456)	(0.00562)	(0.00298)	(0.00361)	(0.00451)	(0.00248)	(0.00332)	(0.00530)
	[0.00571]		−0.00229	[0.002473]		0.000963	[0.002911]		0.00334
RiskH InDeposit*	−0.00756	−0.00378	−0.00507	−0.00312	0.00215	−0.00300	−0.0120	0.000685	0.00474
	(0.00743)	(0.00354)	(0.00470)	(0.00586)	(0.00372)	(0.00505)	(0.00925)	(0.00476)	(0.00725)
	[−0.004886]		−0.00278	[−0.00137]		−0.001301	[−0.00519]		0.0023
UnDeposit	−0.00260	0.00390	0.0108**	0.00340	2.14e−05	0.00217	0.00443	0.0131*	0.0149
	(0.00292)	(0.00437)	(0.00533)	(0.00314)	(0.00390)	(0.00519)	(0.00365)	(0.00740)	(0.0102)
	[−0.000684]		0.00644	[0.00121]		−0.000355	[0.00224]		0.00593
RiskH UnDeposit*	0.0154***	0.00411	0.00513	−0.0125	−0.0122	−0.0328***	0.00222	0.00908	0.00942
	(0.00358)	(0.00333)	(0.00618)	(0.0141)	(0.00861)	(0.0109)	(0.0159)	(0.00879)	(0.0139)
	[0.00899]		0.0020632	[−0.0079]		−0.020191	[−0.000035]		0.004935

(Continues)

TABLE A3 (Continued)

	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE
	PreCrisis	PreCrisis	PreCrisis	Crisis	Crisis	Crisis	PostCrisis	PostCrisis	PostCrisis
	1	2	3	4	5	6	7	8	9
	DivAs	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*
MBV	−0.0161***	−0.0190	−0.0209*	−0.000999	0.00110	−0.0140***	0.000150	−0.00119*	−0.00106
	(0.00489)	(0.0126)	(0.0125)	(0.000937)	(0.00118)	(0.00501)	(0.000301)	(0.000716)	(0.000676)
	[−0.01007]		−0.0120	[−0.00054]		−0.00576	[0.00007]		−0.000399
DivPremium	−0.0373	−0.0781*	0.0296	−0.472**	−0.518**	−0.768***	0.191***	0.278***	0.325***
	(0.0326)	(0.0409)	(0.0340)	(0.206)	(0.221)	(0.276)	(0.0548)	(0.0485)	(0.0680)
	[−0.02326]		0.0169	[−0.25339]		−0.317	[0.09214]		0.123
Observations	1,174	1,174	1,174	1,258	1,258	1,258	1,927	1,927	1,927
Bank FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared		0.719			0.621			0.587	

Note: The table displays our robustness check results of the impact of bank debt on dividend payouts for listed banks during the pre-crisis period (2004Q1-2006Q4), the crisis period (2007Q1- 2009Q4), and postcrisis period (2010Q1-2015Q4). The dependent variable is the dividend-to-equity ratio (*DivEq*) and subordinated debt is scaled by risk-weighted assets (RWA). See Table 1 for variable definitions. For each variable, the first row shows regression coefficient, second row shows standard error, and third row shows marginal effect. The marginal effects for our interaction terms are calculated following the methodology of Norton et al. (2004) by taking the discrete difference between our dummy values. All regressions are estimated with robust standard errors, clustered at the bank level. *** p<0.01, ** p<0.05, * p<0.1.

TABLE A4 Robustness Check – No TBTF: All Banks

	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE
	PreCrisis	PreCrisis	PreCrisis	Crisis	Crisis	Crisis	PostCrisis	PostCrisis	PostCrisis
	1	2	3	4	5	6	7	8	9
	DivAs	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*
SND	−0.0265	0.110**	0.206***	−0.0428	0.00512	0.00898	−0.0606*	−0.00224	−0.0812
	(0.0326)	(0.0450)	(0.0734)	(0.0284)	(0.0195)	(0.0426)	(0.0324)	(0.0297)	(0.0504)
	[−0.01234]		0.0633	[−0.01763]		0.00361	[−0.02287]		−0.0191
*RiskH*SND*	−0.0118	0.0661	−0.00616	−0.00960	0.0625**	0.0654	−0.0206	0.00323	−0.208**
	(0.0543)	(0.0447)	(0.0556)	(0.0682)	(0.0277)	(0.0591)	(0.123)	(0.0267)	(0.0913)
	[−0.007871]		0.00213678	[−0.00403]		0.01383004	[0.00177]		−0.0317846
InDeposit	0.00865***	−0.000749	0.00106	0.00610***	1.96e−05	0.000418	0.00320***	0.000303	0.000630
	(0.000504)	(0.000623)	(0.000977)	(0.000439)	(0.000350)	(0.000686)	(0.000449)	(0.000509)	(0.000898)
	[0.00377]		0.000275	[0.00233]		0.0000500	[0.00094]		0.0000453
RiskH InDeposit*	−0.00209*	0.000361	−0.00171*	−0.00333***	0.000231	−0.00207**	−0.00645***	−0.000220	−0.00391***
	(0.00115)	(0.000648)	(0.000968)	(0.00113)	(0.000429)	(0.000973)	(0.00166)	(0.000546)	(0.00147)
	[−0.00046]		−0.0005386	[−0.001331]		−0.000452	[−0.00206]		−0.0006559
UnDeposit	−0.00310***	0.000877	0.00658***	−0.000370	−0.00126*	0.000175	−0.000189	0.00203**	0.00527***
	(0.000866)	(0.000829)	(0.00146)	(0.000774)	(0.000650)	(0.00150)	(0.000979)	(0.000862)	(0.00147)
	[−0.00126]		0.00195	[−0.00017]		0.0000244	[−0.0001]		0.000994
RiskH UnDeposit*	0.00289	−0.000684	−0.00248	−0.000427	−0.000677	−0.000718	−0.000807	−0.00184*	0.000175
	(0.00188)	(0.00108)	(0.00204)	(0.00231)	(0.00112)	(0.00246)	(0.00244)	(0.00100)	(0.00208)
	[0.00126]		−0.000679	[−0..00017]		−0.0001578	[−0.00019]		−0.0001149

(Continues)

TABLE A4 (Continued)

	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE
	PreCrisis	PreCrisis	PreCrisis	Crisis	Crisis	Crisis	PostCrisis	PostCrisis	PostCrisis
	1	2	3	4	5	6	7	8	9
	DivAs	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*
Observations	68,233	68,233	68,233	72,495	72,495	72,495	106,852	106,852	106,852
Bank FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared		0.710			0.683			0.653	

Note: The table displays our robustness check results of the impact of bank debt on dividend payouts for all banks excluding TBTF banks during the pre-crisis period (2004Q1-2006Q4), the crisis period (2007Q1-2009Q4), and postcrisis period (2010Q1-2015Q4). The dependent variable is the dividend-to-asset ratio (*DivAs*). See Table 1 for variable definitions. For each variable, the first row shows regression coefficient, second row shows standard error, and third row shows marginal effect. The marginal effects for our interaction terms are calculated following the methodology of Norton et al. (2004) by taking the discrete difference between our dummy values. All regressions are estimated with robust standard errors, clustered at the bank level. *** p<0.01, ** p<0.05, * p<0.1.

TABLE A5 Robustness Check – No TBTF: Unlisted Banks

	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE
	PreCrisis	PreCrisis	PreCrisis	Crisis	Crisis	Crisis	PostCrisis	PostCrisis	PostCrisis
	1	2	3	4	5	6	7	8	9
	DivAs	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*
SND	−0.0279	0.101**	0.203***	−0.0649**	0.00582	0.0153	−0.126***	−0.0250	−0.115**
	(0.0347)	(0.0464)	(0.0786)	(0.0296)	(0.0202)	(0.0454)	(0.0361)	(0.0257)	(0.0546)
	[−0.01241]		[0.0615]	[−0.02549]		[0.00512]	[−0.0435]		[−0.0248]
*RiskH*SND*	−9.48e−05	0.0699	−0.00775	0.0138	0.0644**	0.0688	0.0638	0.0214	−0.162*
	(0.0563)	(0.0462)	(0.0579)	(0.0708)	(0.0288)	(0.0625)	(0.124)	(0.0252)	(0.0904)
	[−0.00204]		[0.00141]	[0.0054]		[0.01427]	[0.03122]		[−0.0233]
lnDeposit	0.00852***	−0.000680	0.00112	0.00596***	3.00e−05	0.000431	0.00296***	8.16e−05	0.000264
	(0.000513)	(0.000629)	(0.000998)	(0.000443)	(0.000351)	(0.000691)	(0.000456)	(0.000512)	(0.000888)
	[0.00369]		[0.00029]	[0.002265]		[0.0001]	[0.00085]		[−0.00003]
RiskH InDeposit*	−0.00221*	0.000373	−0.00176*	−0.00322***	0.000207	−0.00209**	−0.00619***	−0.000206	−0.00399***
	(0.00115)	(0.000653)	(0.000978)	(0.00115)	(0.000432)	(0.000993)	(0.00167)	(0.000537)	(0.00145)
	[−0.00052]		[−0.00054]	[−0.00128]		[−0.0005]	[−0.001956		[−0.00066]
UnDeposit	−0.00299***	0.000907	0.00646***	−0.000486	−0.00123*	7.64e−05	−0.000513	0.00187**	0.00535***
	(0.000881)	(0.000853)	(0.00149)	(0.000788)	(0.000667)	(0.00153)	(0.000998)	(0.000870)	(0.00148)
	[−0.00121]		[0.0019]	[−0.00022]		[0.00002]	[−0.00022]		[0.001]
RiskH UnDeposit*	0.00278	−0.000595	−0.00228	−0.000488	−0.000600	−0.000496	−0.000919	−0.00184*	9.60e−05
	(0.00188)	(0.00109)	(0.00210)	(0.00233)	(0.00113)	(0.00251)	(0.00245)	(0.00100)	(0.00208)
	[0.00119]		[−0.00061]	[−0.00019]		[−0.00011]	[−0.00018]		[−0.00014]

(Continues)

TABLE A5 (Continued)

	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE
	PreCrisis	PreCrisis	PreCrisis	Crisis	Crisis	Crisis	PostCrisis	PostCrisis	PostCrisis
	1	2	3	4	5	6	7	8	9
	DivAs	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*
Observations	67,155	67,155	67,155	71,334	71,334	71,334	104,999	104,999	104,999
Bank FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared		0.710			0.685			0.655	

Note: The table displays our robustness check results of the impact of bank debt on dividend payouts for unlisted banks excluding TBTF banks during the pre-crisis period (2004Q1-2006Q4), the crisis period (2007Q1-2009Q4), and postcrisis period (2010Q1-2015Q4). The dependent variable is the dividend-to-asset ratio (*DivAs*). See Table 1 for variable definitions. For each variable, the first row shows regression coefficient, second row shows standard error, and third row shows marginal effect. The marginal effects for our interaction terms are calculated following the methodology of Norton et al. (2004) by taking the discrete difference between our dummy values. All regressions are estimated with robust standard errors, clustered at the bank level. *** p<0.01, ** p<0.05, * p<0.1.

TABLE A6 Robustness Check – No TBTF: PLC Banks

	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE
	PreCrisis	PreCrisis	PreCrisis	Crisis	Crisis	Crisis	PostCrisis	PostCrisis	PostCrisis
	1	2	3	4	5	6	7	8	9
	DivAs	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*
SND	−0.109*	0.284*	0.255*	0.0798	−0.0117	−0.0452	0.153**	0.310**	0.300**
	(0.0642)	(0.160)	(0.149)	(0.0757)	(0.103)	(0.125)	(0.0722)	(0.145)	(0.143)
	[−0.06985]		[0.137]	[0.02835]		[−0.0257]	[0.07621]		[0.0929]
*RiskH*SND*	−0.0618	0.0107	−0.0201	−0.314**	0.125	−0.125	0.0398	−0.331	−0.587
	(0.154)	(0.0788)	(0.0876)	(0.139)	(0.0762)	(0.146)	(0.469)	(0.214)	(0.415)
	[−0.03104]		[−0.0124]	[−0.19557]		[−0.0713]	[−0.01084]		[−0.231]
lnDeposit	−0.0134***	−0.00298	−0.00762	−0.00110	−0.000783***	−0.00111	0.000185	−0.000564	0.00487
	(0.00428)	(0.00633)	(0.00531)	(0.00103)	(0.000288)	(0.00496)	(0.000322)	(0.00142)	(0.00514)
	[−0.00816]		[−0.00443]	[−0.00059]		[−0.00061]	[0.0001]		[0.00189]
RiskH lnDeposit*	−0.0218	−0.0782*	−0.00602	−0.606***	−0.626***	−0.00245	0.204***	0.282***	0.00141
	(0.0334)	(0.0423)	(0.00408)	(0.193)	(0.192)	(0.00575)	(0.0543)	(0.0462)	(0.0101)
	[−0.01322]		[−0.0032	[−0.32557]		[−0.00142]	[0.0989]		[0.00077]
UnDeposit	0.0108***	−0.00739	0.00974**	0.00483	−0.00138	0.00270	0.00726***	0.00447*	0.0132
	(0.00227)	(0.00449)	(0.00493)	(0.00332)	(0.00345)	(0.00512)	(0.00265)	(0.00259)	(0.0126)
	[0.00617]		[0.0048]	[0.00235]		[0.00024]	[0.00277]		[0.00523]
RiskH UnDeposit*	−0.00651	−0.00495*	−0.0102	−0.00530	0.00144	−0.0254**	−0.0168	−0.00128	0.00635
	(0.00758)	(0.00275)	(0.00773)	(0.00494)	(0.00374)	(0.0110)	(0.0115)	(0.00595)	(0.0198)
	[−0.00414]		[−0.0056]	[−0.00285]		[−0.0135]	[−0.00692]		[0.00313]

(Continues)

TABLE A6 (Continued)

	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE
	PreCrisis	PreCrisis	PreCrisis	Crisis	Crisis	Crisis	PostCrisis	PostCrisis	PostCrisis
	1	2	3	4	5	6	7	8	9
	DivAs	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*
MBV	−0.00721***	0.00192	−0.0103	0.00169	0.00367	0.00203	0.00256	0.00964	−0.000763
	(0.00277)	(0.00412)	(0.00627)	(0.00345)	(0.00417)	(0.0113)	(0.00398)	(0.00904)	(0.00142)
	[−0.00367]		[−0.0056]	[−0.0004]		[0.00093]	[0.00115]		[−0.0003]
DivPremium	0.0126	−0.00299	0.0284	−0.0284**	−0.0170*	−0.827***	−0.00218	0.00734	0.327***
	(0.00784)	(0.00643)	(0.0428)	(0.0112)	(0.00869)	(0.277)	(0.0228)	(0.0130)	(0.0671)
	[0.00749]		[0.0154]	[−0.01837]		[−0.381]	[−0.00116]		[0.124]
Observations	1,078	1,078	1,078	1,161	1,161	1,161	1,853	1,853	1,853
Bank FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
		0.721			0.613			0.601	

Note: The table displays our robustness check results of the impact of bank debt on dividend payouts for listed banks excluding TBTF banks during the pre-crisis period (2004Q1-2006Q4), the crisis period (2007Q1-2009Q4), and postcrisis period (2010Q1-2015Q4). The dependent variable is the dividend-to-asset ratio (*DivAs*). See Table 1 for variable definitions. For each variable, the first row shows regression coefficient, second row shows standard error, and third row shows marginal effect. The marginal effects for our interaction terms are calculated following the methodology of Norton et al. (2004) by taking the discrete difference between our dummy values. All regressions are estimated with robust standard errors, clustered at the bank level. *** p<0.01, ** p<0.05, * p<0.1.

TABLE A7 Robustness Check – PLC Banks with TARP

	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE
	Pre-Crisis	Pre-Crisis	PreCrisis	Crisis	Crisis	Crisis	Post-Crisis	Post-Crisis	PostCrisis
	1	2	3	4	5	6	7	8	9
	DivAs	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*
SND	−0.0823	0.420***	0.407**	0.0234	0.0748	0.0227	0.108*	0.206*	0.185*
	(0.0678)	(0.144)	(0.161)	(0.0754)	(0.147)	(0.137)	(0.0552)	(0.110)	(0.109)
	[−0.04721]		0.233	[0.01282]		0.00638	[0.04754]		0.0633
*RiskH*SND*	0.0669	0.0222	0.0142	0.00508	0.192	−0.0785	−0.103	−0.126	−0.186
	(0.131)	(0.0785)	(0.0866)	(0.225)	(0.123)	(0.214)	(0.300)	(0.162)	(0.205)
	[0.04295]		−0.004746	[0.00675]		−0.042324	[−0.0528]		−0.069474
InDeposit	0.00990***	−0.00436	−0.00343	0.00492*	−0.000338	0.00274	0.00710***	0.00630*	0.00847
	(0.00221)	(0.00453)	(0.00560)	(0.00296)	(0.00362)	(0.00454)	(0.00239)	(0.00323)	(0.00522)
	[0.00571]		−0.00225	[0.00247]		0.00101	[0.00288]		0.00338
RiskH InDeposit*	−0.00769	−0.00391	−0.00533	−0.00358	0.00224	−0.00309	−0.0121	0.000859	0.00512
	(0.00746)	(0.00348)	(0.00454)	(0.00587)	(0.00375)	(0.00505)	(0.00905)	(0.00445)	(0.00684)
	[−0.00496		−0.00278	[−0.00169]		−0.001298	[−0.00521		0.002609
UnDeposit	−0.00264	0.00392	0.0105**	0.00337	−1.45e−05	0.00201	0.00414	0.0132*	0.0150
	(0.00291)	(0.00435)	(0.00528)	(0.00309)	(0.00394)	(0.00525)	(0.00354)	(0.00735)	(0.0101)
	[−0.0007]		0.00625	[0.0012]		−0.000440	[0.00211]		0.00593
RiskH UnDeposit*	0.0156***	0.00317	0.00440	−0.0123	−0.0126	−0.0334***	0.00239	0.00774	0.00795
	(0.00359)	(0.00291)	(0.00597)	(0.0141)	(0.00869)	(0.0109)	(0.0156)	(0.00840)	(0.0130)
	[0.0091]		0.0020632	[−0.0078]		−0.019527	[0.0001]		0.004141

(Continues)

TABLE A7 (Continued)

	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE	Tobit No FE	OLS FE	Tobit FE
	Pre-Crisis	Pre-Crisis	PreCrisis	Crisis	Crisis	Crisis	Post-Crisis	Post-Crisis	PostCrisis
	1	2	3	4	5	6	7	8	9
	DivAs	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*	*DivAs*
MBV	−0.0161***	−0.0174	−0.0194	−0.000995	0.00112	−0.0137***	0.000141	−0.00109	−0.000952
	(0.00485)	(0.0125)	(0.0123)	(0.000933)	(0.00119)	(0.00500)	(0.000301)	(0.000688)	(0.000650)
	[−0.01005		−0.0110	[−0.000535		−0.00567	[0.00007]		−0.000360
DivPremium	−0.0370	−0.0793**	0.0313	−0.436**	−0.531**	−0.760***	0.209***	0.278***	0.319***
	(0.0327)	(0.0394)	(0.0341)	(0.212)	(0.227)	(0.282)	(0.0520)	(0.0440)	(0.0620)
	[−0.023064]		0.0178	[−0.23428]		−0.314	[0.10102]		0.120
TARP				0.0810	−0.0242	0.0154	0.0539	−0.0882	−0.144
				(0.0611)	(0.0476)	(0.0594)	(0.113)	(0.0969)	(0.127)
				[0.04577]		0.00645	[0.02692]		−0.0486
Observations	1,174	1,174	1,174	1,258	1,258	1,258	1,927	1,927	1,927
Bank FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
		0.722			0.621			0.591	

Note: The table displays our robustness check results of the impact of bank debt on dividend payouts for publicly listed banksbanks during the pre-crisis period (2004Q1-2006Q4), the crisis period (2007Q1-2009Q4), and postcrisis period (2010Q1-2015Q4). The dependent variable is the dividend-to-asset ratio (*DivAs*), and *TARP* is a dummy that takes the value one during the period a bank is engaged in the programme, and zero otherwise. See Table 1 for variable definitions. For each variable, the first row shows regression coefficient, second row shows standard error, and third row shows marginal effect. The marginal effects for our interaction terms are calculated following the methodology of Norton et al. (2004) by taking the discrete difference between our dummy values. All regressions are estimated with robust standard errors, clustered at the bank level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.