Advanced Corporate Finance

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1 Referee Reports

1.1 Corporate Governance and Banks: What Have We Learned from the Financial Crisis?

Published as the Staff Report no. 502 of the Federal Bank of New York in June 2011, the paper "Corporate Governance and Banks: What Have We Learned from the Financial Crisis" by Mehran, Morrison and Shapiro delves deep into the relationship between the financial crisis of 2007 and failures in corporate governance of banks.

In particular, the authors look to provide the answer to two main questions: why is the corporate governance of banks different from that of nonfinancial firms and where did the governance of banks precisely fail before and during the events of 2007.

Due to the urgency in taking policy decisions immediately after, a disconnect between these and academic research appeared, and this work sought to provide a major literary review on topic to properly ground policy decisions on empirical evidence and scientific research. As bank size and complexity increased exponentially in the years leading to the crisis, the effect of policy decisions looking to prevent similar situations or mitigate their impacts is less clear than ever. Thus, a proper overview on such implications and empirical foundations was needed.

For this purpose, the authors review a sizeable amount of literature, with a special focus on 32 papers where the relationship between governance and several measures of risk and performance are analyzed. This allows them to reasonably deduce when is this relationship reliable or if the evidence is somewhat mixed and inconclusive, providing better policy recommendations based on these facts and suggesting where further research is needed. Data regarding CEO pay structure and board size and independence is also used. Overall, the discussion in this paper is extremely well presented, reasoned and sourced.

Regarding the first research question, two main differences are noted between the governance of banks and the governance of nonfinancial firms. The most prominent one is the much larger number of stakeholders banks have, given they are usually composed of 90 percent debt when compared to the average of 40 percent for nonfinancial firms. These are mostly debtholders, such as depositors or bond holders. However, due to the regulatory nature of the business, it is argued deposit insurance authorities and the government also have stakes in the banks. Nonetheless, the board of directors represents only the shareholders, whose interests may diverge severely from those of the majority of the stakeholders with regards to risk, for instance. On one hand, debt is seen as a cheap factor of production for banks instead of a source of financing, and the complexity of the valuation of their assets makes it hard to realistically price deposit insurance, leading to overleveraging. Secondly, it is argued that the business of banks is significantly more opaque and complex in nature than that of nonfinancial firms and it can change at a much faster pace. While there is no academic agreement

on the true extent of this opacity, the securitization of assets allows banks to quickly reshuffle risk factors and merge large amounts of information hidden under credit ratings, and financial stress can also be understated by extending loans to creditors who could not fulfil past obligations.

To answer the second and main question, the paper looks into four different subdivisions of corporate governance.

First, the role of executive compensation is analyzed. The authors note the influence of the deposit insurance authority on the size of the firm and how this increases executive pay, showing an economic incentive to regulate compensations. Furthermore, while it is usually argued that using stock options as compensation to increase pay-performance sensitivity should translate into higher debt costs and consequently reduction of leverage, evidence from the vesting schedules of options suggests this practice promoted focus on short-term returns, and the literature proves that higher risk taking incentives did indeed to higher volatility and worse performance during the crisis.

With this in mind, it is proposed that exposing CEO pay to the default risk and credit ratings of the firm allows to tackle the observed excessive risk taking. This may be achieved, for instance, by tying the pay to the CDS spread of the firm over the performance period, which can be seen directly as a market price for the probability of default of the firm.

Secondly, the relationship between board size and composition with performance and risk measures is shown to be ambiguous, even with regards to characteristics such as the expertise of the directors and their other occupations, and the authors are unable to obtain a definite answer. The regulatory and supervisory difficulties with regards to board composition are exposed, leaving as an open question how to align the interests of the board with other stakeholders.

Next, several flaws regarding risk management during the relevant period are pointed out. Namely, the lack of integration of risk management in the firms' organization, the lack of both understanding and specification of risk levels by the boards and directors, risk-inducing compensation practices and low relative power of the CROs relative to the CEOs. Avoiding these flaws and clearly communicating the risk appetite of the organization should be at the center of the risk management practices of a financial firm.

Finally, the market discipline of financial firms is discussed. Banks have traditionally managed to creatively overcome regulatory limitations, due to the weakening of of market discipline and the complexity of institutions. The fact that some institutions have become indeed 'too-big-too-fail' has lead to bad market discipline practices, and a case is made for limiting the size of banks or the narrowing and separation of commercial and institutional banking, but the evidence is still mixed regarding this type of institutional solutions. One other suggestion made is to reduce the debt preference of banks by reducing the value of the deposit insurance net or abolishing the tax advantage associated with corporate debt. As this seems unrealistic, alternative policies are proposed as well, such as instead extending this type of tax advantage to other types of equity capital, in order to push banks toward healthier capital structures.

Personally, as someone with little background in corporate finance and governance, this paper as given me to have a broad overview of the topic and clearly exposed some of the major flaws in financial firm governance and the complexity of the problem itself, showing as well why policy solutions are so hard to design. It is definitely a work that should be revisited in the future, both as a reference and as a source of inspiration for research.

1.2 Is Corporate Governance Different for Bank Holding Companies?

Published as a part of the Economic Policy Review of the Federal Reserve Bank of New York in April 2003, the paper "Is Corporate Governance Different for Bank Holding Companies?" by René Adams and Hamid Mehran looks to explain the differences in governance between financial and

manufacturing firms in the wake of the major corporate scandals in the period before, most notably that of Enron.

The authors state that most of the empirical literature on corporate governance draws on data from publicly traded non-regulated, non-financial firms, due to the sheer amount of reports available on such companies. However, this poses a problem from a regulatory and managerial standpoint. Theoretically, the governance of financial firms, and in particular banks, is different from that of non-financial ones, due to the nature of the business itself and the amount of leverage involved. This raises the question about whether policy measures taken to avoid corporate collapses similar to those observed in the previous years are effective for regulated financial firms, and thus it is paramount to understand exactly how different governance is for this class of firms.

To further justify the importance of the paper, the authors present several arguments on the origins of such differences. For instance, they note that boards of banks have extra regulatory fiduciary duties when compared to boards of non-financial companies, and that these may exert some pressure on the holdings' boards. Furthermore, board resolution in case of distress is also played out differently in the case of banks, where liquidation is the usual case. Cases regarding compensation structures, capital structures and competition in the managerial market affecting executive compensation are also made. The size of the boards is also expected to be larger since, even though hostile takeovers, an external tool for governance, are rare in the banking industry, they usually do not lead to the immediate removal of the previous board.

Regarding the methodology, the authors collect data on 35 publicly traded BHCs among the 200 largest for each year between 1986 and 1996, and additional data was acquired for the next 3 years from the SEC, where the sample size reduced slightly due to mergers and acquisitions. The balance sheet data is obtained from Consolidated Financial Statements and stock data from the Center for Research in Security Prices. The authors note that the size of the firms, representing close to 50 percent of the industry in 1998, biases the result against smaller firms. However, they argue that this fact makes them systemically important and as such are at the focus of policy making. A case against survivorship bias is also made, in the sense that the results hold for individual years as well. The comparison study is made against manufacturing firms, mostly because their governance structures have been extensively studied and more data is available. Several descriptive statistics pertaining performance and qualitative governance characteristics are analyzed both over the full timeline and in individual years.

The results obtained answer the research question decisively, in accordance to previous individual studies. To present their results, the authors look into 5 dimensions of governance: board size, board activity, CEO compensation, CEO ownership and block ownership.

While BHC boards are getting smaller, an average S&P manufacturing company had six fewer directors on average, which can be justified by the positive correlation between board and firm sizes, the complexity of BHCs and the nature of hostile takeovers in the banking sector. It remains unexplained, however, observed decrease in board size over the considered time period, which was especially active in terms of consolidation.

Board activity also shows statistically significant differences, albeit only slightly and at the median level. BHC boards meet somewhat more frequently than manufacturing firm boards, at an average of 8.5 times per years, even though this number as been reducing over the years as well. The average number of board committees is also statistically significantly larger for BHCs.

While there has been an increase in the reliance on stock options for CEO compensation in BHCs, this trend is in line with that of manufacturing firms. Nonetheless, the fraction of the salary paid in stock options is 60 percent larger in manufacturing firms. This might be explained by the low growth, low volatility characteristics of BHCs, which implies that the same compensation requires a larger amount of capital dilution, as the stock option value is lower.

On average, the CEO of a BHC holds about 2.3 percent of the equity of the firm, versus the 2.9 percent of a manufacturing firm CEO. We see that this inequality is reversed in median terms, however. One possible explanation is that due to low volatility of BHCs, monitoring costs may be lower and thus large ownership concentration may be unnecessary. The same trend is observed in nominal (market value) terms, to account for this factor. Therefore, it is possible that BHCs' CEOs have a different incentive structure when compared to manufacturing firms.

Finally, block ownership is analyzed. Bank affiliated institutional holdings represented the greater part of major shareholders and were removed from the data set, since these are often associated with asset management, trusts and custodial activities that are unlikely to actively monitor the BHC. We see that mean institutional holdings and the mean number of institutional holders are significantly smaller for BHCs, both annually and over the full period.

The authors conclude that the governance differences found are indeed systematic and industry specific. Thus, policy measures regarding corporate governance should not be taken at a high level. Instead, to be effective, they need to take into account industry differences. This result is, of course, particularly important to the banking sector, where these differences are much more salient. Finally, the paper suggests that these results may imply that current corporate governance practices of the banking industry is not optimal, and future industry specific research is needed.

To conclude this review, some suggestions are made with regards to the methodology and possible future work. While justified by the authors, the issue of survivorship bias might be worth investigating by itself, in order to better understand the governance differences between surviving and non-surviving firms. Furthermore, the use of only manufacturing firm data as a counterfactual restricts this comparison to a specific industry. A study comprising of a more general dataset or even comparing multiple industries simultaneously would add value to the obtained results. Finally, the statistical approach restricts itself to descriptive quantities, mostly due to the small sample size. With a larger sample, a regression based framework would allow to control for other externalities or industry specific factors and obtain an even deeper, possibly more enlightening result.

Reading this work has allowed me to have an expert level introduction to the methodologies used in empirical Corporate Finance, and has thus laid the foundations for my possible future research. The opportunity to put my previously acquired skills in an environment where I am not so comfortable is invaluable, and has lead to a greater understanding of the topic. Furthermore, the time of publishing and the renown of the authors allows me to have a unique perspective on the academic and practical evolution until recent years, since this work was developed in the wake of major financial events, such as the dot.com bubble and the Enron collapse, and showcased some of the governance differences that would later come into question during the 2007 financial crisis, after which the authors continued further studies.

1.3 Outside monitoring and CEO compensation in the banking industry

First written in 2008 in the aftermath of the Great Financial Crisis and published in 2010, "Outside monitoring and CEO compensation in the banking industry" is a paper by Kose John, Hamid Mehran and Yiming Qian where the authors shed light on the issue of top management compensation and the conflicts of interest between management, shareholders and debtholders.

The authors note that current literature focuses on the alignment of managerial incentives with the interests of the shareholders. It is known, however, that this alignment goes against the interests of debtholders with regards to risk taking, an effect which is especially noticeable in levered firms as is the case of banks. There was, thus, an essential gap in academic research.

Their work is based on the model first proposed by John and John in 1993, which was the first attempt at covering this gap and analyzing both effects simultaneously. With this framework,

John and John showed that the optimal pay-for-performance sensitivity should decrease with higher leverage, in order to avoid excessive risk taking at the expense of debtholders.

To extend this line of research, the authors augment the model to allow for the presence of outside monitoring of the firm. An important difference between the usual case study of manufacturing firms and the banking industry is pointed out, however. In the former, the main debtholders are normally banks themselves, which have a strong incentive to monitor the performance of the management. For banks, however, most of the leverage comes from depositors, which are insured by the FDIC, and thus have a much weaker incentive to monitor the firm. The role of subordinated debtholders is therefore of major importance for the health of the banking system, along with the monitoring done by regulators.

The present theoretical work then shows that, while in agreement with previous research, the presence of strong outside monitoring allows for a larger pay-for-performance sensitivity in optimal managerial compensation. To test these arguments, the authors propose two essential hypothesis: that pay-for-performance sensitivity decreases with the leverage ratio and increases with the intensity of outside monitoring of the firm's risk choice.

The proposed methodology is as follows. Pay-for-performance sensitivity is modelled as a linear function of previous period leverage ratio, outside monitoring and other control variables. CEO compensation is taken as the independent variable and is regressed with a fixed-effects model on performance related compensation, which is the pay-for-performance sensitivity multiplied by equity returns, the leverage ratio, outside monitoring and other control variables.

The data set is composed of 1017 CEO-years, from 1993 to 2007 and 143 bank holding companies. Compensation data is obtained from Standard and Poor's ExecuComp database, accounting data from Compustat and stock return data from CRSP. Non-performing loan data is obtained from the Federal Reserve Bank of Chicago, subordinated debt ratings from Moody's Default Risk Service, and examination ratings data from the Board of Governors of the Federal Reserve System. All dollar-values used are inflation adjusted, according to data from the Bureau of Labor Statistics.

The measure used for CEO compensation is the CEO's firm-related wealth change, in accordance with previous literature, as it is the most appropriate for estimating pay-for-performance sensitivity.

To measure outside monitoring intensity, the authors use subordinated debt ratings, non-performing loan ratio and BOPEC rating. Most notably, they use this data to construct a monitoring index, which is normalized at a percentile level.

The obtained regression results are statistically significant, strongly robust and are in favor of the proposed hypothesis. Namely, the coefficient on the interaction term between leverage ratio and return to shareholders is significantly negative, supporting the first hypothesis and being in accordance with past literature, and the coefficient on the interaction between monitoring and return to shareholders is significantly positive, as predicted by the second hypothesis.

The results remain valid and statistically significant for extensive robustness checks, such as the use of different measures for firm size, risk, CEO compensation, stock returns or leverage ratio. Different regression models are also used to, for instance, discard the possibility of serial correlations biasing the results. Furthermore, while the use of lagged variables is justified due to the temporal difference between fixing the CEO compensation structure and the results later in the same period, the results still hold with contemporaneous variables. The possibility of endogeneity is also addressed. While compelling theoretical arguments are presented against the effects of endogeneity, a simultaneous model with several instrumental variables is nonetheless estimated, and evidence for the two hypothesis is still found.

The conclusions of this paper are certainly important in the context of corporate governance as a whole, not only for the banking sector. For instance, the evidence indicates that a firm with a large fraction of monitored debt could benefit from higher pay-for-performance sensitivity in the

managerial compensation structure. The theoretical model provides further insight into optimal compensation structures and leads the way to more complex extensions. The role of subordinated debtors and regulators as monitors in the case of banks is also emphasized. The authors also propose new research avenues, suggesting that other factors such as takeovers or board monitoring and their impacts on managerial compensation should also be studied.

This work is extremely comprehensive, deep and robust, granting strong validity to the results. Therefore, I suggest that replicating such a study using European data would be valuable, due to the differences in regulatory environments. Such a study might shed some light on the implications of these differences and further validate the theoretical underpinnings in corporate governance. Furthermore, it would be interesting to see if there are any changes to the results (or if they are even more significant) in the years after the Great Financial Crisis and policy changes thereafter. On the other hand, developing the proposed theoretical framework could lead to testing directly if banks are using optimal or suboptimal compensation structures.

Personally, it was a pleasure to read such a thorough piece of academic research, in particular regarding a complex and human topic as is the case of corporate governance. It is an example in how empirical research should be conducted and it significantly raised the bar for any of my future work.

1.4 Debt Maturity, Risk and Asymmetric Information

Published in the Journal of Finance in 2005, the work of Allen Berger, Marco Espinosa-Vega, Scott Frame and Nathan Miller begins with a simple but surprisingly deep question: why do firms with long-term projects often borrow on a short-term basis? At the time, debt maturity was gaining notoriety concerning policy issues, due to past financial crisis and recent troubles with credit availability and liquidity.

Most literature tackled this question by analyzing market imperfections such as agency costs or taxes. The authors of this paper, however, look to analyze the role of risk in determining debt maturity in the presence of asymmetric information and, most importantly, the interaction between these two factors.

To do this, two major works that model this interaction are analyzed, the 1986 Flannery's model and 1991 Diamond's model. While closely related and similar in nature, the small differences in the modelled economies lead to some different empirical predictions. Even though both agree on the effects of asymmetric information on each level of risk, for instance, the conclusions regarding the relationship between risk and maturity diverge. Flannery's model implies that higher risk firms borrow on a longer basis than low risk firms, where as Diamond's model suggests that maturities are non-monotonous functions of risk, due to the fact that high risk firms may be locked out of accruing long term debt.

Thus, the authors of this paper set out to empirically test both models simultaneously and devise two tests for this purpose, arguing that this is possible since the risk levels are determined at the same instant in both models. The first, Test 1, seeks to determine which model induces a correct relationship between maturity and risk. Test 2 looks instead to examine the effects of reduced informational asymmetry on debt maturities for each risk rating.

The biggest innovation of this work is the use of the Small Business Credit Scoring system, SBCS, a technology used by some banks to help assess the credit risk of small firms, as a proxy of reduced asymmetry of information, as suggested by the literature. This allows them to be the first to test these effects at the highest and lowest levels of informational asymmetry, and the first to test asymmetry effects on maturities by risk ratings. Furthermore, bank loan data is also used instead of public debt information as is more common in the empirical literature, allowing them to focus

on a population which is risky in nature and where asymmetric information plays a stronger role. The authors note that, as banks might be able to use better tools than public markets to reduce the effects of asymmetry, this might explain some of their findings not consistent with past works.

The proposed methodology relies on an ordinary least squares regression, with robust standard errors to account for heteroskedasticity and possible clusterings and correlations along observations from the same bank. The dependent variable of interest is taken as the $\log(\text{MATURITY} + 1)$, since many observations range on shorter timelines, and its regressed onto factors such as the risk level, the usage (or not) of the SBCS system, interactions between these two, and several control variables. Namely, the authors control for loan contract terms (collateral, commitments and credit size), bank size, bank loan health and the quarter during which the loan was given out. In total, four risk categories are considered. The tests are then be formally stated as several tests on the values of the model's parameters.

The data set consists of 6532 bank loan observations to small businesses. Contract terms are obtained from the Federal Reserve STBL and SBCS system usage is obtained from a 1998 phone survey done by the Federal Reserve Bank of Atlanta. Regulatory reports of the banks are also consulted. The intersection of these three datasets gives the final dataset to be used, with data from the last three quarters of 1997. Total credit size is restricted to less than \$250 thousand, related with the small business definition for SBCS, but a distinction is made for those less than \$100 thousand as well. Only banks that use SBCS as an additional risk measure, instead of sole feature, are considered on the sample.

Regarding the first test, the authors are able to reject the null hypothesis in favor of the alternative that the lowest risk firms have shorter maturity loans than intermediate risk firms in all four regressions, which defer in credit size and controlled or not for contract terms. When only loans for which the SBCS system was used are considered, however, the null is not rejected for credit sizes between \$100 thousand and \$250 thousand. This fact highlights the importance of reduce informational asymmetry in determining debt maturity. Furthermore, the null hypothesis that highest risk loans have the same maturity as intermediate risk loans is not rejected, even though they do appear to be higher. While this finding seems to go against the implications of Diamond's model, the authors note that this does not mean that it does not apply to high risk firms, but rather that other effects could be dominating the determination of debt maturity.

As for the second test, a large statistically significant increase of 72% in debt maturity for low risk firms when the SBCS system is used is observed, which is consistent with the predictions of both models. The authors, however, cannot reject the null for other risk levels, even though the data appears to show a decrease in maturity.

Several tests for the robustness of the results are also presented. Several sample and specification changes are accounted for, which for the most part lead to no qualitative results, even if slightly less statistically significant at times. These include changes in debt maturity measure, the removal of outliers, adding more control variables and relaxing the restriction on bank SBCS usage. It is worth noting, however, that the results of Test 1 are not consistent with the models when loans of up to \$1 million are included. The authors note that, for these large amounts, banks may have access to other tools to reduce informational asymmetry and therefore debt maturity determination is dominated by other effects.

Subsample regressions are also carried out, and a particular notable case is when only loans without commitments are considered. In this case, Diamond's model holds across all risk levels, which might be explained by a clientele effect in which high risk firms are only offered short term loans to mitigate their information risk, or the lack of strong banking relations.

Finally, possible endogeneity issues are addressed. The possibility that loan risk ratings are endogenous to the usage of SBCS is discussed, in the sense that reduced asymmetry of information

could internally lower the risk rating of the firm. A logit regression is tested to account for this effect and the result is not statistically significant. Furthermore, it is also noted that the adoption of SBCS may be endogenous with the debt maturities practiced by the bank. The results remain robust to removing observations where the bank has adopted the system less than one year before.

While the paper shows strong results for loans to low risk firms consistent with both models, it appears to favor Flannery's predictions for high risk firms rather than Diamond's. The authors note, however, that these may reflect a comparative advantage for banks over public markets, with regards to information, renegotiation capabilities and setting contract terms. Thus, banks may have better tools other than short maturities to resolve issues such as moral hazards and adverse selection problems for risky firms. The results also highlight the strong quantitative role of asymmetric information in determining debt maturity.

Some of the results might not be statistically significant due to the high segmentation of the data. Therefore, it would be interesting to see how the study holds up against a larger data set, with possibly more debt determinants or more risk classes. Moreover, given that only data from 1997 is used, it might be worth exploring a more extensive timeline where other effects might be accounted for. Recent developments and techniques for reducing asymmetry problems could also be analyzed under the proposed methodology, leading to a better understanding of their effectiveness.

Overall, the paper is very clear and there is a natural cadence from the theoretical introduction to the main models, the empirical methodology and the presentation of the results, making it a very worthwhile read.

1.5 Tests of ex ante versus ex post theories of collateral using private and public information

"Tests of ex ante versus ex post theories of collateral using private and public information" is an innovative paper by Allen Berger, Scott Frame and Vasso Ioannidou, published in the Journal of Financial Economics in 2011.

According to the authors, collateral is a widely employed tool for debt contracts yet seen as costly at many levels. On one hand, lenders incur in screening costs to monitor the assets taken as collateral, while on the other hand, borrowers suffer from massive opportunity costs due to having these same assets tied up. Many social costs are also involved when personal collateral is considered. Furthermore, correlated changes in the valuation of certain types of collateral has greatly amplified pro-cyclical movements, as is the case of the role of real estate in the Japanese debt crisis and the US 2007 crisis.

Therefore, understanding the origins and the real effects of collateral is of major importance. The authors discuss the two main economic theories underlying this issue and set out to empirically test the predictions of them both.

Ex ante theory mostly understand collateral as a compensation for asymmetric information, whereas ex post theory sees it as a tool for resolving and mitigating incentive problems such as moral hazards. In the former borrowers may signal their high quality projects by posting collateral and obtaining lower premiums for their loans, allowing lenders to sort observationally equivalent borrowers and implying an inverse relationship between risk and collateral. However, in the latter it is the lender that may require collateral due to the difficulties in enforcing contract terms, implying a positive relation between risk and collateral.

Past empirical work found strong evidence for ex post theories, whereas the literature on ex ante theories has led to some mixed results due to a lack of clean measures. The main innovation in this work is the particular data set used by the authors, from the public credit registry of Bolivia, which allowed them to isolate both theories by having access to true private information of the firms. This

data set was obtained from the Bolivian superintendent of Banks and Financial Entities, from March 1998 to December 2003, and included 32286 bank loan observations to 2676 firms. Renegotiations of past loans were removed and only commercial loans by commercial banks were included.

Their methodology was based on a probit regression with time and bank fixed effects, to account for the troubled financial period Bolivia was in during the considered time period. The probability of a given loan having posted collateral is taken as a function of the observable risk, unobservable risk, relationship length between the firm and the bank, the interaction between unobservable risk and relationship length, and controls for the firms and loan terms. The observable risk variable includes past defaults and recent delinquencies in payment, while the unobservable risk includes delinquencies more than 3 months before the new loan issue, since this information is kept private in the credit registry.

The authors argue that these variables form good measures of private and public information, since no other credit registry was active in Bolivia during this time period, Bolivian credit markets are largely opaque and the economic theory is consistent even if there is some disclosure of this information.

The obtained results are, first of all, consistent with the ex post theories and past obtained results. An increase in observed risk leads to a statistically and economically significant increase in the probability of collateral being posted, an effect of between 4 and 12%. Regarding ex ante theories, unobserved risk is not significant by itself. However, when the interaction with relationship length is considered as well, this effect becomes clear. For new borrowers, an increase in unobserved risk implies a decrease of about 15% in the probability of posting collateral, and this effect remains negative until a relationship of 7 months between borrower and lender is established. This result is not only consistent with ex ante theories, but it is also consistent with the decrease in private information predicted by lending theory. Furthermore, a negative relationship between relationship length and collateral is also found and significant.

These results are robust to several additional relationship metrics, different loan sizes and other specification changes. Including the interest rate as a regressor, while potentially endogenous due to co-determination with collateral, has no material effect as well. When only discount loans are considered, some measures of observed risk lose significance. However, 30+ day delinquencies in the past two months remains a significant variable and the effect is also unchanged.

Since the extant literature also relates risk measures with collateral, the authors find additional evidence by analyzing the relationships between risk premium and the probability of ex post non-performance as dependent variables and collateral. Evidence for both theories is again found, where the presence of collateral reduces loan premiums as predicted by ex ante theories, yet also increases the probability of ex post delinquencies or defaults.

Thus, this work covers a large gap in the literature and showcases when each of the ex post or ex ante effects dominate in the presence of asymmetric information and when strong borrower-lender relationships are established. The role of credit registries in developing countries seems to be particularly relevant and a case is made for establishing such systems in other nations, as the information provided might reduce the need for costly collateral hampering economic development.

It would be interesting to see similar studies in other countries with similar credit registry systems and perhaps during less turbulent time periods. Moreover, a comparison using data from a period before the installment of this system in Bolivia could provide additional insights into its benefits and lead to stronger policy recommendations.

This paper, while comparatively short, is extremely concise, dense with insights and a pleasant read. It showed me how finding the right data set and opportunity can lead to such relevant insights, and how answers may be found where you least expect them.

1.6 Is there a diversification discount in financial conglomerates?

Authored by Luc Laeven and Ross Levine, the paper "Is there a diversification discount in financial conglomerates?" was published in 2007 in the Journal of Financial Economics and extends the literature on the impacts of greater diversification of activities on the performance of financial intermediaries.

The extant theoretical literature showed mixed results regarding the nature of these impacts. Some theoretical exercises imply that financial conglomerates are able to enjoy economies of scope through diversification, allowing them to boost performance and therefore their valuations. For instance, ideas based on Diamond's work suggest that diversification of activities gives banks additional information about their clients, which in turn reduces asymmetric information problems and improves their loan making businesses.

However, studies focusing on agency problems show that diversification actually intensifies the clash of interests between corporate insiders and small shareholders, as the former may choose to diversify even if this results in a loss in valuation, as long as their personal gain outweighs the loss.

Past empirical literature, which mostly focused on non-financial firms, also faced similar problems regarding inconclusive results, especially due to measurement problems. Economies of scope require several assumptions to be effectively determined and the effects of agency problems are hard to differentiate in the data. Mergers and acquisitions make these studies more difficult as well, since this type of diversification frequently happen when a larger firm buys out a smaller troubled one at a discount, resulting on an average loss in valuation. Other problems are also highly pervasive, such as simultaneity bias arising from codetermination of variables and the reliance on self-reported data.

The authors are able to overcome these problems by directly measuring how the range of activities affects valuations instead. This way they are able to examine the net impact of diversification on several performance measures and control for different activities being valued differently by the markets. Furthermore, they focus on the diversification issue in a single industry, massively simplifying the measurement problem. The fact that the financial industry is significantly more opaque than most makes agency problems more severe, making this environment ideal to study the discussed theories. Finally, their version of the "chop shop" approach does not rely on self-reported data, increasing the robustness of the results.

For this purpose, the authors construct several measures of diversification, indicating ranges of activities and income. The banks' total loans relative to their total assets reflects a range of activity between pure commercial banking and pure investment banking, whereas the ratio between interest and total operating income provides a range of lending to fee based and trading activities. Similar measures of asset and income diversity are also constructed. Preliminary tests show that these measures characterize well individual banks whose activities are well known.

For performance measures, the authors use both Tobin's q and excess Tobin's q. To obtain the latter, an activity adjusted q is computed through a "chop shop" procedure, where the banks' different activities are treated as their own individual firms, and is then subtracted from the total q, making it a relevant measure for diversification discount.

The bank-level data used for this study is obtained from the Bankscope database, which is preferred over other commonly used ones such as Compustat or Worldscope due to not being as reliant on self-reported data. Small banks are excluded from the sample, as well as financial entities that have no investment, deposit and loan making activities. Islamic banks are also not considered due to their structural differences and extreme accounting outliers are removed.

This procedure results in a data set consisting of 3415 bank-year observations, from 1998 to 2002. The methodology is then based on a preliminary analysis of descriptive statistics and several regression methods.

At a mean and median level, the authors conclude that diversified banks have a significantly negative excess value, implying the existence of a diversification discount. This value appears to be smaller than that of non-financial firms estimated in past studies. One possible explanation is that areas of diversification for financial conglomerates are rather similar in nature, especially when compared to non-financial diversification.

Regarding the regression analysis, the effects of diversity measures on Tobin's q and excess Tobin's q are significantly negative, confirming the preliminary findings. Due to the way the excess measure was constructed, these results are robust to markets valuing the range of activities differently. Furthermore, banks that mainly engage in less traditional activities are valued more highly than those that mostly focus on loan making.

Several tests are performed to ensure the validity of the results. When controlling for country level economic cycles and several bank level characteristics (such as size, operating income and competition in the deposit market), with both types of fixed effects, we still observe a significant diversification discount. Non-time varying country level controls are also analyzed, especially regarding differences in supervision, regulation and deposit insurance. While some of these variables appear significant, the results remain unchanged. Furthermore, the results remain robust to several subsample estimations, alternative valuation and performance measures and controlling for insurance activities, which were initially not considered. No merger bias is detected, meaning that the detected diversification discount is not being misinterpreted.

The issue of endogeneity is also discussed at length, since the decision to diversify or not could be co-determined with the valuation itself. A first approach, where the results are controlled for bank specific traits, shows that fixed effects are not driving the observed discount. Secondly, four different instrumental variable regressions are analyzed, where the instruments include, for instance, an index of regulatory restrictions, restrictions to bank entry, the average income of other banks or the share of diversified banks in the country. In either of the specifications, simultaneity bias does not show and the previous results remain robust and significant.

Overall, the answer to the question proposed by the authors is clear. There is a diversification discount, meaning that markets assign lower values to financial conglomerates that engage in multiple activities. While this paper does not distinguish between the two main theories of diversification, it shows that the negative effects dominate. In terms of policy implications, while economies of scope are generally pushed as a driver of performance, it seems that the ill effects of intensified agency problems may outweigh the gains.

Several avenues of future research became possible with this work. In particular, complementing the regression framework with recently used measures of asymmetric information and agency problems may shed some light on the individual effects of the two main conflicting theories of the effects of diversification.

The paper states a very clear question and answers it even more clearly. The past issues and difficulties are presented and overcome in a very effective manner and the extent of the robustness tests make this work a landmark paper in the topic of diversification.

1.7 Subordinated debt, market discipline and banks' risk taking

Written by Jürg M. Blum and published in the Journal of Banking and Finance in 2002, "Subordinated debt, market discipline and banks' risk taking" is a landmark paper in corporate finance laying the theoretical grounds for better understanding the impacts of subordinated debt on the market discipline of banks and its effect on their risk taking.

This work was developed in a time where recurring banking crisis were showcasing the high costs of deposit safety nets. While the cost taxpayers have to bear is clear, moral hazard costs and other

market distortions originating from these safety nets became evident as well.

As such, alternatives to this direct safety mechanism were highly sought after, and market discipline was seen as the main candidate. Past literature usually pointed policy makers to establishing minimum levels of subordinated debt in the capital structure of banks.

As subordinated debtors are the first, after equityholders, to bear losses in case of default without having the upside of risk, they have a strong incentive to monitor banks' risk taking. Their role in setting interest rates and determining market prices of debt suggests they would have a strong impact on the banks' risk choice.

At the time, it was believed there were two main theoretical advantages of subordinated debt with regards to this role. On one hand, since interest rates and market prices of debt contain information about the risk of the bank - information that is readily available and can be used for supervision, subordinated debtors impose indirect market discipline on banks' choices.

On the other hand, they are able to impose direct market discipline as well. In theory, by demanding a higher risk premium in new debt issues, the bank incurs in higher financing costs and therefore must adjust its risk level if they wish to lower these costs, and thus investors may directly influence bank behavior.

Past literature focused mostly on the role of deposits, essentially short-term demandable debt, in exercising market discipline. However, a severe limitation of this approach is that depositors may only discipline in ex post, when the struggles of the bank are observable.

In this work, the authors seek to contest the effect of direct market discipline. In their new model, they are able to include ex ante disciplining by the contracting of interest rates and banks' risk choices are modelled explicitly. Within this framework, they are able to show that if banks cannot commit to a particular risk level, then the use of subordinated debt may actually lead to an increase in risk taking.

In this model, the economy consists of a single risk-neutral bank, which must make a one period investment decision. Its only liability are the deposits and there is no equity. Furthermore, the deposit demand is constant and positive, granted that the expected return is not lower than the risk free rate.

In the beginning of the period, the bank will choose its target return X, which will happen with a decreasing probability $p(X)$, and otherwise is 0. Since the risky portfolio weakly dominates the risk free investment, the bank will always choose to take the risk. In this model, the target return X is understood as the bank's risk level, and it is observable but not enforceable. If the bank defaults and cannot pay back the depositors, the owners incur in fixed bankruptcy costs, modelling loss of charters, private benefits and reputation.

The authors then proceed to compare several different settings to establish their results. In a first-best setting, serving as a benchmark case and considering only deposits, the social planner maximizes the expected economic surplus and we see that the optimal risk level is less than the one that maximizes return.

However, if a deposit insurance exists, depositors accept the risk-free rate of return. In this case, the marginal cost of risk becomes smaller for the bank, since the bankruptcy costs are offset by the benefits of deposit insurance, which may be interpreted as a put option owned by the bank. Therefore, the bank chooses a higher risk level than if there was no insurance.

The case of subordinated debt is thereafter analyzed, represented by an uninsured fraction of the deposits. Since debtholders costlessly observe the risk choice of the bank, debtors demand a contracted rate such that their expected return is the risk free rate.

When the bank is able to commit to a contracted risk level, their marginal cost of risk is the same as in the deposit insurance case, with the exception that the bankruptcy benefits are now reduced. Thus, the authors conclude that, in this case, the use of subordinated debt leads to a lower level

of risk when compared to the case where only fully insured deposits are considered, and this value decreases when the fraction of subordinated debt is larger.

However, the conclusions differ in a non-commitment environment. Here, the bank may increase its risk level after an interest rate is determined to increase their returns. This setting is more relevant when modelling banks, since they may quickly adjust their risk by, for instance, moving assets and by using financial derivatives.

Rational investors anticipate this change and demand higher rates in return. Due to this, the marginal cost of risk for the bank in a Nash equilibrium is lower than in the case of full deposit insurance.

Therefore, if the bank won't commit to a particular risk level, market discipline through the issue of subordinated debt leads to an increase in risk when compared to the safety net case.

The model is kept as simple as possible to highlight the adverse effects of subordinated debt. Several limitations of this approach are discussed by the authors. While the static nature of the model seems to be a strong downside, in a dynamic setting the higher risk, inefficient equilibrium cannot be ruled out. Furthermore, the lack of maturities in the model is not problematic, since longer maturities exacerbate the issue, due to the higher interest rates, and shorter ones would not be withdrawn since investors would still choose to break even.

This work successfully highlights the ambiguous role of subordinated debt in banks' risk taking incentives and the limitations and adverse implications of direct market discipline. While the role of indirect market discipline remains clear, it is questionable if it outweighs the effects shown in the paper, and the desired information may also be partially inferred from equity.

Some questions are raised regarding how empirical studies are interpreted, since the positive relationship between risk and interest rates may show that banks are actually not deterred by higher financing costs to take higher risks.

In terms of policy implications, carefully designed hard covenants for subordinated debt may help rule out extreme cases of opportunistic behavior and may slightly reduce excessive risk taking, but it is not expected they eliminate all the adverse incentives described. A better alternative could be imposing rate caps from regulators. It is not clear, however, if these effects are enough in practice, and there are some strong limitations with regards to implementation.

With this in mind, it would be fruitful to see empirical work differentiating these two effects of direct and indirect market discipline. To help design such a study, an extended model to account for indirect market discipline by including asymmetric information would probably be needed and would surely be interesting addition to the theoretical literature.

1.8 Market Discipline of Banks: The Asset Test

Authored by Donald Morgan and Kevin Stiroh, and published in the Journal of Financial Services Research in 2001, "Market Discipline of Banks: The Asset Test" sets out to provide strong evidence for the case of market discipline.

Besides the classically recognized roles of government supervision and capital structure in the regulatory matrix of banking activities, market discipline was gaining political and academic traction as a third pillar in this context. At the time, reformers were calling for mandatory issuance of subordinated debt, both due to its indirectly imposed market discipline, given the valuable information provided by market set interest rates, and the direct effects of imposing higher financing costs to riskier banks. The main rationale behind this perspective is that this mandatory issuance would offset the moral hazards of deposit insurance.

However, past literature was somewhat inconclusive on the relationship between spreads on new bond issues and the level of risk and performance of the bank. While earlier results showed little

to no evidence of this, recent studies were able to identify significant relations with more developed methodologies and better data. Nonetheless, the vast majority of these studies focus on classical proxies for risk and performance, which is natural in setting a new field. The authors of the paper question the adequacy of these measures, mostly due to their ex post nature and the focus on debt as the single asset of interest. Furthermore, past methodologies do not allow us to distinguish if banks incurring in higher spreads are being rewarded for participating in high-risk, high-return activities.

This work then settles the questions of whether spreads reflect the ex ante risks in the asset distribution of banks and if investors are penalizing banks when they shift towards riskier assets. The authors decisively find out that banks shifting out of cash and safer loan activities such as real estate loans incur in higher spreads on new bond issues. Moreover, investors penalize more heavily trading activities. The major empirical methodology contribution of this paper is the use of primary market spreads on new bond issues, as opposed to secondary market rates. This way, the spreads represent actual transactions, rather than quotes by traders, and include mandatory issues as well, which are of regulatory interest. Even though there is a possible positive bias due to the banks timing their voluntary issuances favorably, the evidence found is still robust.

To develop this analysis, the authors collect bond issue data from the Securities Data Corporation, from 1993 to 1998. This results in a dataset of about 500 traditional, fixed rate, investment grade bonds issued by 81 banks and bank holding companies. Issuer data is obtained from FR Y-9C regulatory quarterly reports. Bond characteristics include the spread, average rating of the issuance, face value, maturity and if the issued bond is subordinated debt or not. The interest rate gap is the used proxy for interest rate risk, return on assets for profitability and equity-asset ratio for leverage. The quality of the loan portfolio of the bank is also controlled for. The new variables of interest are the asset shares in the balance sheet of the bank. With cash being the riskless asset, it is taken as base case and thus it is expected that a shift from cash into other assets has a negative effect on the issue spread.

Their analysis is based on several regression frameworks, both with the usual OLS and bank and time fixed effects. The results are also replicated with and without a ratings variable, due to mixed literature interpretations and the fact that it includes summarized information about multiple other variables, reducing their explanatory power.

To study their hypothesis that investors look past performance and ratings and look directly at the mix of assets held by the bank, the authors propose two tests, the joint significance of the asset mix and the individual significances of individual asset classes, alongside their coefficients being different. Theoretically, with assets being riskier than cash, they should come with positive coefficients, with the most risky having the largest coefficients.

Preliminary results, without the balance sheet variables, show that the dataset is largely consistent with past empirical results in terms of significance and sign of the effects. Past performance shows a higher effect in the fixed effects framework, meaning that it is more highly rewarded than interbank differences. Somewhat unexpectedly, however, leverage shows little or negative relation with spreads. This might be explained by the use of book value rather than market value, reducing the explanatory power of the variable.

For the complete analysis, the previously detected effects remain essentially unchanged. The size of the effect of performance on spreads is significantly larger, which shows that the reward for high returns depends on the assets generating those returns. The authors are able to confidently reject the joint insignificance of assets across all regressions, with most of the asset classes being significant and positive in sign. Trading is especially significant and has a stronger effect than other assets. The F-test rejects the equality of loan coefficients under fixed effects, providing evidence that bond markets differentiate between different mixes of loans in the balance sheet of the bank. This does not occur, however, in the pooled OLS estimation, suggesting that the individual effects might be

distinguishing long term strategic differences between the banks.

These results show that market discipline might actually be stronger than previously thought, as investors also price the decision to engage in certain activities. Furthermore, bankers contemplating shifting into trading or commercial lending should expect larger spreads on new bond issues. This work also may help evaluate policy proposals such as mandatory subordinated debt offerings, but should be interpreted with care due to the possible positive bias associated with voluntary issues. The case for market discipline remains strong nonetheless, since it is still relevant even if this bias is present.

For the future, it would be interesting to see a replication of the study with a larger dataset, allowing for higher significance and possibly a subsample analysis over mandatory and voluntary offerings, which could lead to stronger policy implications and is of regulatory interest. Repeating the analysis with market-valued equity would complement the results in a natural manner as well.

1.9 CEO inside debt holdings and risk-shifting: Evidence from bank payout policies

The size and imposed cost to taxpayers by government bailouts of the 2007 Great Financial Crisis sparked an increased interest in understanding which factors determine banks pursuit of risky policies, with the goal to prevent excessive risk taking. Authored by Abhishek Srivastav, Seth Armitage and Jens Hagendorff and published in the Journal of Banking and Finance in 2014, the paper "CEO inside debt holdings and risk-shifting: Evidence from bank payout policies" provides strong answers on how to motivate banks to pursue policies which protect creditor and taxpayer interests.

With excessive risk taking implying some form of risk shifting from equityholders to debtholders, due to their different payoff structures and upside exposures, it is important to mitigate such activities. This paper studies this question from the point-of-view of CEO compensation structure, focusing on bank payout policies. Since payouts represent outflows of cash, risky assets are left composing a larger share of the balance sheet, and therefore there is reduced quality and quantity of capital available to pay creditors in the future.

Past empirical literature on CEO compensation structure is based around equity compensation and performance and risk sensitivities, without much work being done on inside debt. This left a large gap in the literature, as debt may represent as much as 50% of CEO compensation. Furthermore, it aligns their interests with debtholders, due to imposed pay sensitivity to default risk and, most importantly, liquidation value. Thus, inside debt should have an overall negative effect on payouts, and similar results have been shown for nonfinancial firms.

The authors are able to show that bank CEO's with higher inside debt holdings are more likely to cut payouts and do so by larger magnitudes as well. This work provides a major contribution to the literature on CEO compensation, showcasing the role of compensation incentives as a determinant of payout policy and reigniting emerging research on debt-based compensation, which leads to relevant policy implications. Moreover, the authors also analyze in depth the effect on banks assisted by the government under the Troubled Asset Relief Program (TARP), which is a case of high regulatory interest since payouts by bailed-out banks imply a direct cost to taxpayers.

To perform this study, compensation data is collected from the Compustat Execucomp database, with data from 2007 to 2011, as CEO inside debt information was made public in the US in 2006. Bank accounting data is obtained from the quarterly FR Y-9C regulatory reports and stock returns from the CRSP database. This results in an initial dataset of 403 bank-year observations, which is extended to 442 observations across 103 banks by collecting information from alternative sources.

Cash outflows are measured in total payouts in a given year, comprised of both dividends and stock repurchases. According to past literature, net payouts are also considered, where proceedings

from equity issues are deducted from total payouts, as these represent an influx of cash from equityholders. The dependent variables of interest are then the probability of a reduction in payouts and the magnitude of the change relative to the bank's assets. CEO inside debt is measured as the logarithm of CEO-bank debt-to-equity ratio, to normalize this quantity to the bank's holdings. The total debt based compensation is defined as the present value of accumulated pension benefits and deferred cash compensation.

The authors control the results for sensitivities in compensation to risk and performance, firm characteristics such as size, profitability and growth opportunities, available cash and leverage. Firm risk is proxied by the portfolio risk of the bank's assets, computed as the standard deviation of their market value. CEO age is also controlled for, since older CEO's tend to be more risk averse, and the regressions include time fixed effects to average out the financial turbulence experienced in the considered time period.

The initial results obtained are very much conclusive. It is shown that CEO-bank debt-to-equity ratio is a determinant of the bank's payout policy and it is also economically significant, where a change of 1 standard deviation in the variable increases the probability of a cut in payouts by between 6 and 7%. In terms of total reduction, the same increase of 1 standard deviation in inside debt increases the size of the cut by 13 to 20 basis points, representing in absolute value 80 to 120 million dollars. The controls also have the expected signs when considering both total and net payouts.

The analysis proceeds with the distinction of TARP banks. While a preliminary study can be done by including an interaction term, the authors note the endogeneity issue caused by this variable and a 2-stage least squares approach is more appropriate, due to co-determination. Three instruments are adopted from the literature to explain the allocation of taxpayer funds, most notably related to the bank's geographic location and its political connectedness. The previous results remain valid under this approach, and the allocation of funds is not significant in the 2SLS framework, highlighting the endogeneity problem. More interestingly, inside debt is shown to be significantly more effective in TARP banks than in those outside the program.

The results are robust to several changes. Since payouts are composed as two different quantities, it is possible that some substitution effect exists and only one of them is being reduced. The obtained results remain when replicating the tests on either of them individually. Other robustness checks include using alternative measures of inside debt incentives and different measures for repurchases, and supporting evidence is still found in any case.

This work finds strong supporting evidence for the idea that debt-based compensation can help address risk-shifting concerns. Thus, the effects of inside debt as a part of CEO compensation should take a more prominent role, both in academic and empirical research and in policy making. By showing that it is also an effective tool in risk mitigation at TARP banks, regulators should consider it as reliable requirement in managerial contracts when intervening at a firm. Finally, due to the similarities between inside debt and deferred equity, further studies should be performed to better understand the properties of the latter as an alternative method of compensation.