Does governance quality matter in financial intermediation? A comparison between bank and insurance companies

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Abstract

The global financial crisis highlights the need for an effective governance mechanism in the financial sector. In contrast to the insurance companies, banks are operating in a highly regulatory environment globally with specified standards appropriate for the nature of the business. This suggests that insurance companies are more susceptible to agency problems in comparison to banks. We therefore investigate if governance quality varies across banking and insurance companies. The study is based on ten years' data for 560 banks and 214 insurance companies from 28 countries. We find that governance quality is lower for insurance companies as compared to banks. The consequences of inferior governance quality for insurance firms include higher agency problem which increases their risk and reduces financial performance. The findings persist across all subsamples and robust measures. Finally, we confirm with country-level analysis that improvement in governance quality for insurance firms leads to better risk management and financial performance. Such findings have further implications for the insurance sector and could allow insurance firms to better control their risk with an effective governance structure.

Keywords: Governance quality, Financial Intermediation, Insurance companies, Banks, Agency Cost

JEL Classifications: G30, G22

1. Introduction

The traditional theory of financial intermediation is founded on Alfred Marshall's classical idea of a perfect market, which is formalized in the traditional Arrow-Debreu model of resource allocation. Markets are perfect when all economic agents have the same level and quality of information, and they are subject to pay no transaction costs and taxes. However, the reality is different, and this traditional theory of financial intermediation is extinct, at least because of the prevalence of information asymmetry (Chu, 1999) in the market that leads to severe agency costs. Financial intermediaries such as banks and insurance companies nowadays operate in an environment of information asymmetry because markets are not perfect. The financial intermediaries are there as long as there are market imperfections; financial intermediaries get redundant as soon as markets are perfect, where the investors have the complete information to find each other without any hurdle and cost (Scholtens & Van Wensveen, 2000).

The investors' (economic agents) earnings (cash flows) are subject to uncertainties caused by the idiosyncratic random shocks in an imperfect financial market, and the risk-averse investors seek protection against such disturbances. Insurance companies in a conventional setting are unable to provide such protection because the income fluctuations due to the random shocks are not publicly observed (Hill & Viceisza, 2012). However, banks can provide such protection by providing regular and terminal deposit returns that redistribute wealth from high-income to low-income groups, resulting in a level of expected utility for depositors that exceeds other market alternatives (Haubrich & King, 1990). Hence, banks and Insurance companies provide risk management services for economic agents in a different dimension. What about intermediation since both are financial intermediaries? This question is essential because both banks and insurance companies are major providers of financial intermediation services in addition to risk management.

Banks, as financial institutions, provide direct intermediary services by collecting deposits and lending money to the deficit economic agents that ensure the investment of surplus funds. In contrast, insurance companies, as non-banking financial institutions, provide intermediation by collecting premiums, pooling them to more substantial funds, and investing in institutional arrangements. Since banks collect deposits directly from the depositors and commit them to return at maturity or in demand with either less or no return, their accountability is higher. On the other hand, insurance companies collect premiums for which they commit to pay compensation to the policy holders contingent upon future losses. Therefore, banks and insurance companies differ in terms of return commitments and information asymmetry. Following the theoretical discussion, we argue that information asymmetry and indirect agency costs are higher in insurance companies (Doherty & Dionne, 1993) than those of banks (Sufi, 2007). Agency cost has a direct relation with the governance quality and board composition of banks and insurance companies (Bathala & Rao, 1995).

The earlier studies have reported mixed findings on governance quality, agency problems, and risks for financial institutions (Becht, Bolton, & Röell, 2011; Calomiris & Carlson, 2016). The seminal work of Jensen and Meckling (1976) introduced an agency problem between managers and stockholders that suggests that better corporate governance is essential for improving the operational performance of an institution. Firms with poor corporate governance may have a higher agency cost and be penalized by the market in terms of lower revenue (Hsu & Petchsakulwong, 2010). The board of directors play a much essential supervisory role in maintaining the active conduct of operations and is guided by the code of governance. The majority of the extant literature on board composition and quality (Shahid, Rizwan, & Bucha, 2016; Wang & Oliver, 2009) focus primarily in the context of the banking sector. Puleo, Smith, and Casey (2009) conclude that regulation appears to supplant the need for most corporate mechanisms. Levine and Barth (2001) provide theoretical justification for the regulatory

restrictions of bank activities and highlight the conflict of interest that might arise when banks engage in activities such as underwriting, insurance underwriting, and real estate investment. Barth, Caprio, and Levine (2013) find substantial heterogeneity of bank regulatory and supervisory policies across 180 countries covering the period from 1999 through 2011. Banks and insurance companies operate in the financial industry, but the nature of banking operations and its association with the recent global crisis (Reinhart & Rogoff, 2008) subjects the banking sector to a higher level of regulatory frameworks. Central banks of developed and emerging markets have prescribed a unique set of Corporate Governance (CG) guidelines for the banking sector.

The findings of the earlier literature on the governance of insurance companies are inconsistent and inconclusive, and we identify that there is hardly any study that compares the governance quality of insurance firms with that of banks and its effect on agency problems and associated risks. Based on the theoretical conflicts and inconclusive findings, our study therefore attempts to investigate if governance quality varies across insurance companies and banks leading to variation in agency problems and risks for the investors. We investigate our research objectives by constructing a global sample of 214 insurance companies and 560 banks from 25 countries covering various regions and continents, including North America, Europe, Asia and the Asia Pacific, Latin America, Middle-East and Africa for the period of 2010 – 2019.

Our study reveals a few interesting findings. *First*, our results confirm that insurance companies have inferior governance quality than banks across various sub-samples. Our findings thus indicate that banks have superior governance than insurance firms which complements the findings of Becht, Bolton and Röell (2011). *Second*, the results also indicate that insurance companies have a higher level of agency problems than banks do. We complement the findings of Vallascasa et al. (2017) by comparing the governance quality between insurance firms and

banks.. *Third*, the findings further indicate that insurance companies are less risky than banks despite having higher agency problems. We extend our comparative analysis on risk management by comparing the performance of insurance companies and banks and find that insurance companies offer better returns with a less risky profile when compared to banks. Such anomaly confirms the findings of Becht et al. (2011) that insurance companies have internal risk management mechanisms which allow them to better manage agency problems.

Fourth, we further examine whether the variation in governance quality between insurance companies and banks has any impact on their agency problem, and the results suggest that an increase in the variation in governance quality leads to the higher agency conflicts. More specifically, insurance companies with inferior governance suffer from a higher agency problem. Such findings complement the findings of Chen, Yao and Yu (2007) by confirming severe agency problems for insurance firms due to weak governance mechanisms. *Fifth*, our results indicate that an increase in the variation in governance quality decreases the variation in risk. This finding allows us to complement the findings of Klomp and De Haan (2012) that supervision in the form of a better governance mechanism affects the risks in financial institutions.

finally, we identify a sub-set of insurance companies, which are owned by either banks or bank holding companies, and investigate if governance quality, agency problem, and risk between stand-alone insurance companies and bank-owned insurance companies are different. The results find that both stand-alone and bank-owned insurance companies have inferior governance quality and a lower level of risk.

Based on the above findings, our study offers four major contributions to the existing body of the insurance and governance literature. *First*, to the best of our knowledge, this study is the first international evidence that empirically shows that the governance quality of insurance companies is inferior to that of banks and consequently insurance companies have a higher

level of agency problems using a comprehensive dataset. *Second*, our study contributes to a new dimension of the existing literature by showing that insurance companies are less risky than banks although insurance companies have higher agency problems, which is a theoretical anomaly. *Third*, this study extends contribution to the investors by comparing the performance of insurance companies and banks and find that insurance companies offer better returns with a less risky profile. *Finally*, the findings of this study raise a new research question of whether insurance companies can mitigate more significant agency problems under the existing corporate governance structures functioning across countries. Also, the findings provide inputs to the regulators and policymakers to consider new governance criteria and regulatory frameworks for insurance companies.

The paper proceeds as follows. Section two presents a theoretical framework of the study. Section three discusses data and methodologies of the study. Section four provides the results, and we provide a critical discussion of results and the findings of our study in section five. Finally, we wrap up our study by presenting a conclusion in section six.

2. Theoretical framework

The seminal work of Jensen and Meckling (1976) has introduced an agency problem that suggests that better corporate governance is essential for improving the operational performance of an institution. Firms with poor corporate governance may have a higher agency cost and be penalized by the market in terms of lower revenue (Hsu & Petchsakulwong, 2010). The board of directors plays a much essential supervisory role in maintaining the active conduct of operations and are guided by the code of governance. However, most of the literature on board composition and quality (Shahid, Rizwan, & Bucha, 2016; Wang & Oliver, 2009) are in the context of the banking sector. Puleo, Smith and Casey (2009) conclude with a sample of 55 insurance companies operating in the United States that regulation appears to supplant the

need for most corporate mechanisms. Levine and Barth (2001) provide theoretical justification for the regulatory restrictions of bank activities and highlights the conflict of interest that might arise when banks engage in activities such as underwriting, insurance underwriting and real estate investment.

Barth, Caprio and Levine (2013) find substantial heterogeneity of bank regulatory and supervisory policies across 180 countries covering the period from 1999 through 2011. Banks and insurance companies operate in the financial industry, but the nature of banking operations and its association with the recent global crisis (Reinhart & Rogoff, 2008) subjects the banking sector to a higher level of regulatory frameworks. Central banks of developed and emerging markets have prescribed a unique set of corporate governance guidelines for the banking sector. The OECD guidelines for insurer governance[2] provide valuable insights and focus on governance structure, internal governance mechanisms, groups and conglomerates, and stakeholder protection. The OECD guidelines are non-binding and extend to both OECD and non-OECD countries, which allows policymakers and regulatory authorities to adopt such policies following the regulatory and supervisory framework of their respective countries. In addition to the internal governance mechanisms proposed by OECD, Lester and Reichert (2009) argue that insurance companies require a second line of defence through external measures, including supervising authority and market mechanisms. Corporate governance can bring sustainability in the insurance sector, which has led to many new types of research in exploring the current governance practices among insurance operators in different parts of the world.

The insurance sector has been treated as a commercial enterprise since the early stage of development, which requires minimum regulatory oversight. However, the insurance sector

[2] OECD Guidelines on Insurer Governance, 2017 Edition is the second draft since the first publication of the guidelines in 2005.

and its product variant have changed in recent years. Modern insurance companies offer various types of policy covers, including third-party liability insurance, life insurance, and pensions. The public at large is motivated to undertake long-term investment by way of retirement income funds with insurance companies. Therefore, the regulatory authority is now liable to ensure that insurers and pension providers are following high standards of corporate governance (Lester & Reichart, 2009). However, the majority of the literature has focused its attention on determining the efficiency of insurance companies (Shafique, Ahmad, Ahmad, & Adil, 2015) and stayed away from the governance dilemma inherent for insurance companies. Some studies focus on a comparative analysis of the performance between the banking and insurance sector, and comparative analysis is available between the performance of conventional and Islamic insurance (Shafique, Ahmad, Ahmad, & Adil, 2015). Although the association between the existence of sound governance mechanisms and performance improvement have been discussed in the earlier literature (Hsu & Petchsakulwong, 2010), a handful of studies have explored the need for a separate set of governance indicators for insurance sectors.

Adams, Hermalin and Weisbach (2010) is an exception in this regard and highlights the diverse nature of governance-related problems for the financial sector. Boyer and Stern (2012) agree with Adams et al. (2010) and find that the existing governance indices used in the literature attempt to implement a "one-size-fits-all" approach. Insurance companies are subject to different governance systems, which allow managers' limited discretion and board of directors' (BOD) monitoring to become the primary mode of the internal control mechanism. Weak governance mechanisms can have disastrous results in the performance of insurance companies and decrease the level of trust among stakeholders (Akeem, Terer, Temitope, & Feyitimi, 2014).

The above discussion shows that most of the earlier studies focused their discussion on the difference between a bank and insurance governance. Moreover, earlier studies often use the corporate governance criteria set for the banking sector to measure the governance quality of insurance companies (Gillan & Panasian, 2015). Therefore, we find it essential to explore the need to establish a separate set of governance criteria for the banking and insurance sector with a particular focus on board quality. We rationalize the study on governance quality due to its potential to play essential monitoring functions to resolve agency conflicts between management and shareholders (Bathala & Rao, 1995). Information on governance quality to mitigate agency conflicts among insurance companies are of limited supply. Garba and Abubakar (2014) attempt to provide empirical evidence on the role of an insurance board toward mitigating agency costs and improving performance but lack generalizability due to the focus on a specific country context.

We identify a few research gaps based on the critical review of the existing literature. The earlier studies examine the comparative governance quality of banks and insurance companies. Besides, the extant studies do not provide clear evidences if banks and insurance companies have same level of agency problems, risks, and performance. Based on the identified research gaps, we develop three major hypotheses to explore our research issues: (i) Ceteris paribus, Insurance companies have lower governance quality than banks, (ii) Insurance companies are exposed to higher agency problems than banks, and (iii) Insurance companies are associated with higher risks than banks are. Besides, we investigate if the variation in governance quality between insurance companies and banks has any impact on their agency problem. After explaining the association between governance quality and agency problems, we examine whether governance quality affects the risk and performance of insurance companies compared with banks in a global context. Motivated by the findings of Zheng, Wang and Xu (2018), we conduct further analyses on governance quality, agency conflicts and risk by extracting a new

dataset with sub-samples that captures unique ownership characteristics relevant for both insurance companies and banks. We identify a sub-set of insurance firms having common ownership with banks. We confirm such an association by identifying insurance companies that belong to a group that also owns a bank and find 51 (out of 214) insurance companies that satisfy such criteria.

3. Data and Methods

We specify the following models to test our hypotheses.

$$Governance\ score_{it} = \beta_0 + \beta_1\ Insurance\ Dummy_i + \Sigma Controls_{it} + \varepsilon_{it} \quad (1)$$

$$Agency\ problem_{it} = \beta_0 + \beta_1\ Insurance\ Dummy_i + \Sigma Controls_{it} + \varepsilon_{it} \quad (2)$$

$$Risk_{it} = \beta_0 + \beta_1\ Insurance\ Dummy_i + \Sigma Controls_{it} + \varepsilon_{it} \quad (3)$$

In Equation (1), $Governance\ score_{it}$ represents the governance quality score for firm i at time t. We measure the quality of governance for banks and insurance companies using a self-developed index consisting of forty items. We follow Luo and Salterio (2014) and Black et al. (2017) and use a binary scoring mechanism. A score of 1 is awarded if the firm fulfils the criteria indicated in the governance index, and 0 otherwise. We describe the index development process in the Appendix.

We construct Equation (2) by expanding the theoretical discussion of Easterbrook (1984) where the author presents two explanations of dividend as a proxy of the agency problem. $Agency\ problem_{it}$ is the dividends per share, following Filbeck and Mullineaux (1999) and Puleo, Smith and Casey (2009) that cash dividends are related to agency costs. In Equation (3), we measure $Risk_{it}$ using the volatility of stock returns (Song, 2017).

Insurance dummy$_i$ is our main explanatory variable which is 1 for insurance companies and 0 for banks. Liu and Lee (2019) use a similar dummy variable to compare the market strength of financial linkages between the bank and insurance-based economic structures.

Following the existing literature, we include three firm-level controls that could influence governance quality, agency problem and risk of both insurance firms and banks. We apply *Age* as the first control variable, which is estimated by the number of years firms are operating since their incorporation. Kieschnick and Moussawi (2018) present an interaction effect of firm age and governance features, concluding that older firms with superior governance quality use less debt-based capital.

Size is the second firm-level control and we measure firm age using the logarithm of total assets. Qian and Yeung (2015) report that larger but less mature financial firms embark on a higher volume of risk-taking behaviour. The final control is *Gearing* and we measure gearing by dividing total non-equity liabilities with total equality. Hanazaki (2003) examines the importance of gearing from the governance perspective and Fukao (2003) extends the discussion covering risk aspects with a comparative view between insurance firms and banks.

To capture the country-level common effect on the governance quality, agency problem and risk, we use three variables: *GDP Growth* (annual growth rate of the gross domestic product), *inflation* (based on consumer price index) and *country governance* (World Bank country governance score). Chen and Liao (2011) use similar country-level controls while comparing the profitability of domestic and foreign banks at the backdrop of market structure, governance and supervision. Finally, we apply both country and year fixed effects to control for unknown effects of the country characteristics and time variations. We provide variable definitions in the Appendix.

We use several steps to ensure a comprehensive sample for the study: *First*, we identify governance items applicable to both insurance firms and banks using a bibliometric review process. Such a process results in the identification of forty governance items classified in nine broad categories, covering *board composition, audit committee, board meetings, duality, compensation committee, nomination committee, corporate social responsibility, disclosure*

and diversity. *Second*, we use the Datastream ASSET4 database to download data for the governance items identified in the first step. *Third*, we exclude countries that do not have governance data for both insurance firms and banks as we aim to provide a comparative overview in our study. *Fourth*, we review the country governance codes for each country to ensure the governance items used in constructing the index is appropriate for both insurance firms and banks. *Finally*, we end up with a sample of 774 firms, 214 insurance firms and 560 banks, from 25 countries for the period of 2010 – 2019. Our sample covers the period after the global financial crisis as banks and insurance firms did not suffer the same consequences from such a crisis (Marović, Njegomir, & Maksimović, 2015). We provide a summary of our study sample in Table 1. With the available evidence from Becht et al. (2011) in terms of sample size, our study covers the global sample across different regions.

[Insert Table 1]

Table 1 shows the maximum number of insurance companies (99) and banks (334) for the United States, while the minimum number of insurance companies (1) and banks (1) belongs to Belgium. Columbia, Poland and Singapore also have 1 insurance company in the overall sample, however, the total number of banks are 5, 10 and 3 respectively. For the other countries, the sample ranges from 2 to 12 insurance firms and 3 to 26 banks. Overall, our sample is widely distributed across 25 advanced and emerging countries. We collect governance, agency problem, risk data for the sample firms covering ten years (2010-2019). A detailed discussion on governance index development process in the Appendix.

Table A1 in the appendix reports the governance quality index results. We use 40 items to develop the governance quality index. We find banks have higher governance quality (0.741) as compared to insurance companies (0.727). The score of insurance companies seems slightly better in 40% of the governance items (16 out of 40). Insurance companies have superior audit committees (scoring higher in 5 out of 7 items) and higher number of board meetings (scoring

higher in 2 out of 3 items) than banks. Insurance companies' governance score is inferior with regards to compensation committee (scoring higher in 1 out of 7 items), diversity and duality. In the case of diversity and duality measures of governance quality, insurance companies' score falls short in all items than banks. In terms of board composition, nomination committee, corporate social responsibility and disclosure, we do not have a clear winner. Our results are in line with Becht et al. (2011) and we confirm, concerning the theory of bank governance, that multi-level regulatory guidance[3] enhances corporate governance for banks.

We provide the summary statistics in Table 2. The variable *Governance quality* has an average score of 71.9% and a standard deviation of 0.123 for the full sample; the difference in means is negative and significant (-0.164), confirming the inferior governance quality of insurance companies compared to banks reported in Table 1. *Agency problem*, measured using dividends per share as a proxy, shows an average score of 0.948 and a standard deviation of 1.461 for the full sample; the difference in means (0.708) reveals significantly higher agency problems for insurance companies when compared to banks. Finally, we measure risk using *Stock return volatility* and report an average volatility score of 0.234 with a standard deviation of 0.315 for the full sample.

The variable *Insurance dummy* is essential for this study as we aim to provide a comparative analysis of governance quality, agency problem and risk between insurance firms and banks. All firm-level control variables are skewed to the right with a minimum skewness score for *Size*. We report average *Age* for insurance firms are 29.20 years while the average age for banks are 37.38. Similarly, insurance firms are smaller (average *Size* = 10.502) than banks (average *Size* = 10.700) and exercise a lower level of *Gearing* with an average score of 7.583 than banks (11.220). *GDP Growth* and *Inflation* are skewed to the right and *Country Governance* is

[3] We refer to the Principles of Sound Compensation Practices in 2009, Basel Committee guidance on bank supervision issued in 1999, 2006 and 2010; and country specific codes of corporate governance.

skewed to the left. Inflation has the maximum positive skewness with a score of 1.550. Overall, we report in Table 2 that our exploratory, explanatory and control variables are not normally distributed.

[Insert Table 2]

We begin our estimation for all regression models using pooled ordinary least square (OLS) estimators. Both pooled OLS and fixed effect (FE) estimators are conventional panel estimation approach applied in corporate finance literature (Zhou, Faff, & Alpert, Bias correction in the estimation of dynamic panel models in corporate finance, 2014). However, fixed effects are not feasible in our setup given the dummy nature of our explanatory variable. Therefore, we considered the suggestions of Caprio, Laeven and Levine (2007) to apply random effect in such a situation. However, the absence of fixed effect results restricted our ability to perform the Hausman test that indicates the appropriateness of a fixed or random effect estimation. We acknowledge that pooled OLS estimation is unable to handle endogeneity problems arising from (1) unobserved heterogeneity, (2) simultaneity and (3) the likely presence of residual autocorrelation. In addition to the above sources of endogeneity, we agree with Wintoki, Linck and Netter(2012) that our study could face additional endogeneity issues as current governance values could be a function of past firm performance. As such we follow the suggestions of Zhou, Faff and Alpert (2014),and apply both instrumental variables (IV) and system generalized methods of moments (system-GMM) to mitigate dynamic panel bias and endogeneity issues inherent in our empirical model. Dang, Kim and Shin (2015), however, mention that system GMM works better when empirical models are not restricted from unobserved heterogeneity. Such condition is very unlikely to be met in corporate finance research. Therefore, we employ additional measures including propensity score matching (Zheng, Wang & Xu, 2018) and quantile regression (Chernozhukov, Fernández-Val, & Kowalski, 2015) to control the endogeneity problem in our empirical model.

4. Results

We explore three hypotheses covering governance quality, agency problem and risk of insurance firms and banks. We begin with a comparative overview of governance quality between insurance firms and then proceed to further explain the consequences of inferior governance toward mitigating agency problems and risk for financial firms. We test the robustness of all baseline empirical models by introducing alternative proxies. In addition, we conduct additional tests to explore the link between governance and performance for insurance firms and banks.

4.1: Governance quality – Insurance companies vs banks

We first examine whether insurance firms have inferior *governance quality* when compared with banks. We report our results in Table 3. The base model indicates insurance firms have a significantly lower governance quality than banks as per the variable *Insurance dummy*: the corresponding estimated OLS coefficient is -0.169, which is significant at the 1% level. Our results suggest that global insurance firms do not follow the same governance standards applicable to the banking sector. We also estimate our baseline model using the system generalised method of moments (GMM) estimation technique to control for endogeneity issues, and find consistent results.

[Insert Table 3]

We estimate our baseline model across various sample dimensions to confirm that insurance firms have inferior governance quality than banks across various sub-samples. We present the OLS results of our sub-sample analyses in Table 4. We present our analysis in four panels by dividing the full sample across the regions, national income level, economic maturity and accounting standards. The *Insurance dummy* bears a significant and negative coefficient across all panels and confirms the consistency of our findings from the baseline model.

[Insert Table 4]

Corporate governance and its impact on firm performance for financial firms have been studied extensively in the past. Empirical evidence on governance for insurance firms (Kim, Maug, & Schneider, 2018) and banks (Díaz & Huang, 2017) are available in past studies. However, only a handful of studies (Becht, Bolton, & Röell, 2011) have compared the governance quality between these two types of financial intermediaries. Therefore, we attempt to reduce this gap by providing a comparative analysis of governance quality between insurance firms (Boubakri, 2011; Eling & Marek, 2014; Elamer, AlHares, Ntim, & Benyazid, 2018) and banks (Hopt, 2013; De Haan & Vlahu, 2016). Our findings indicate that banks have superior governance than insurance firms, which complements the findings of Becht, Bolton and Röell (2011).

The banking sector has gone through a transformation since the 2008 financial crisis and the Basel Committee on Banking Supervision (BCBS)[4] emphasizes the effectiveness of corporate governance for the effective operation of this sector. However, we do not find such emphasis on the governance structure for insurance firms from either global or national regulatory institutions. Drake, Neale, Schorno, and Semaan (2017) prove that the insurance sector responds differently to the disruption from the sub-prime crisis.

We find further justification for a comparative analysis of governance quality between insurance and banking sector as Drake et al. (2017) report a strong correlation between the return of insurance firms and banks during the crisis. Therefore, our findings could be beneficial for both global (for example, the International Association of Insurance Supervision (IAIS) and national standard-setting authorities to review the need for a uniform governance standard for insurance firms.

[4] Please see the Basel committee revised principles on corporate governance for banks, available at: https://www.bis.org/bcbs/publ/d328.htm. In the revised principles, the committee emphasizes on the role of the board of directors, importance of collective and individual competence of board members, need for risk governance and reflects on an effective compensation system as essential components of effective governance framework for the banking sector.

4.2. Agency problem - Insurance vs bank

In Table 5, we compare the extent of agency problems between insurance firms and banks. We find the GMM coefficient of *Insurance dummy* as 0.551 and significant at the 5% level. Our results indicate that insurance firms have a higher level of agency problems than banks. In Table 4, we confirmed that insurance firms had inferior governance. Therefore, we validate the propositions of agency theory that inferior governance quality could leads to higher agency conflicts for insurance firms. In comparison, banks with superior governance quality could benefit from lower agency problems.

[Insert Table 5]

Past examination of bank governance reveals evidence of an ineffective monitoring system and the source of such poor governance links with the internal governance mechanism (Minton, Taillard, & Williamson, 2014). Vallascasa, Mollah and Keasey (2017) report an improvement in bank supervision since the sub-prime crisis. Therefore, we complement the findings of Vallascasa et al. (2017) by reporting superior governance for the banks. Also, we extend past findings of bank governance by comparing the governance quality between insurance firms and banks. Our findings indicate that the increase in regulatory pressure to improve internal governance mechanisms allows the banking sector to enjoy better control of agency problems. In comparison, insurance firms have higher level of agency problems and lower level of governance quality. ElKelish (2018) reports a negative relationship between governance quality and agency problems for both financial and non-financial firms. We extend the findings of ElKelish (2018) by examining governance quality and agency problems for a global sample of insurance firms.

4.3: Risk and performance – Insurance firms vs banks

Bhimani (2009) highlights the emerging interdependences of governance, agency issues and risk management. While earlier studies on governance revolved around designing corporate

codes (Davies & Schlitzer, 2008) to ensure managerial accountability (Brennan & Solomon, 2008), recent studies on governance gradually shift focus toward value creation (Allen, Carletti, & Marquez, 2015) through risk management (Lundqvist, 2015). Risk management for financial institutions has become an important research and policy issue since the sub-prime mortgage crisis. However, the majority of the focus on risk governance has been on the banking sector (Pirson & Turnbull, 2011) due to the direct impact of the 2008 financial crisis on this sector and risk management issues for insurance firms remain unexplored.

Therefore, we attempt to fill this gap by providing comparative evidence on risk management for insurance firms and banks in Table 6. The OLS coefficient of *Insurance dummy* is -0.064 and significant at the 1% level, indicating that insurance firms are less risky (based on stock return volatility) when compared to banks. We extend our analysis by comparing the performance of insurance firms and banks. We find the OLS and GMM coefficients of *Insurance dummy* in Table 6 as positive for both proxies (stock return and return on assets). This result can be considered as surprising because insurance firms seem to provide higher returns although they bear lower risk with respect to the risk-return profile of the banks. This finding is in line with Becht et al. (2011) who report that insurance firms have internal risk management mechanisms which allow them to better manage agency problems.

[Insert Table 6]

We check further the robustness of our results by introducing new measures of risk and performance. We use z-score for risk and find that the estimated OLS coefficient for *Insurance dummy* is -0.255 which is significant at the 1% level. Such a result reaffirms our findings that insurance firms are less risky than banks. Next, we introduce market value per share and earnings per share as alternative performance measures. We find the OLS coefficients for

Insurance dummy as 0.134 and 1.248 for market value ratio and earnings per share, respectively. GMM results for this set of results are qualitatively the same.

[Insert Table 7]

Insurance firms tend to be inactive monitors and often choose to invest a relatively higher portion in low-risk investment options, for example, long-term bonds and mortgages (Ryan & Schneider, 2002). Past studies explore the risk pattern of insurance firms to get a closer look at the internal monitoring mechanisms. Cheng, Elyasiani and Jia (2011) explain the risk-taking behaviour of insurance firms and find that life and health insurance industry have better risk management practices. Our results complement the findings of Cheng, Elyasiani and Jia (2011) and we report that insurance firms accompany lower risk profiles for investors.

We extend the discussion on the risk profile of insurance firms in two ways. First, we compare the risk profile of insurance firms with banks and conclude that insurance firms are less risky. Second, we extend the risk analysis for insurance firms by exploring their performance to provide a clear direction of the risk-return nexus for insurance firms while maintaining a comparative overview with banks. Our findings are different from Anginer, Demirguc-Kunt and Zhu (2014) as they explore bank risk-taking behaviour with the existence of deposit insurance, reflect on the financial crisis to explain risk and systematic fragility of the banking sector and report that deposit insurance provide a stabilizing effect in turbulent times for banks. To some extent, we complement their findings by concluding that the regulatory changes, along with tools such as capital requirements and deposit insurance, does not reduce the riskiness of the banking sector when compared with insurance firms.

4.4. Robust results with sample identification

4.4.1 Propensity score matching (PSM)

Recent studies in finance (Lian, 2017) and accounting (Shipman, Swanquist, & Whited, 2017) are applying the PSM technique as a measure to address the endogeneity problem. Following Zheng, Wang and Xu (2018), we employ the PSM approach and select matched control firms based on a logit model. In the logit model, the dependent variable is *Governance score*. We include controls that may affect a firm's governance quality, such as *Age*, *Size* and *Gearing*. Next, we conduct nearest-neighbour PSM using the predicted probabilities from the earlier logit regression and compare firm characteristics between treatment (insurance firms) and control (banks) firms. Such an analytical process allows us to confirm that the PSM procedure produces a comparable group of treatment and control firms.

Once we confirm the comparability of treatment (insurance) and control (bank) firms, we conduct regression analysis to ensure our results are consistent for each hypothesis. Table 8 presents the regression results for our hypotheses related to corporate governance quality, agency conflicts and corporate risk levels. The OLS coefficients for our explanatory variable of interest *Insurance dummy* are -0.169, 0.372 and -0.005 for the dependent variables *Governance score*, *Agency problem* and *Risk*, respectively. The results hence imply that insurance firms have lower governance quality, higher agency conflicts and lower risk when compared with banks. The GMM regressions reveal similar findings. Our results with the PSM sample are consistent with the post-matched samples, confirming the robustness of our study findings.

[Insert Table 8]

We continue with quantile regression to mitigate the problems associated with relying on a single measure of central tendency. Quantile regressions emphasize the relative importance of certain regressors at different points of the distribution of the loss rate (Schaeck, 2008).

Therefore, we apply this method as an additional robustness measure to explore governance quality, agency problem and risk levels among insurance firms relative to banks. Following Lee and Li (2012), we establish five quantiles and present the results in Table 9. Our findings are again consistent across all quantiles.

[Insert Table 9]

4.4.2 Standalone versus bank connected insurance firms

Zheng, Wang and Xu (2018) emphasize the importance of ownership concentration for the banking sector and include a state ownership dummy in their propensity score matching process to control for government ownership. This procedure motivates us to conduct further analysis on governance quality, agency problem and risk by extracting a new set of sub-samples that captures unique ownership characteristics relevant for both insurance firms and banks. We identify a sub-set of insurance firms with bank associations. We identify 51insurance firms (out of 214) that belong to a group which also own a bank.

In the next stage, we conduct regressions as per the dependent variables *Governance score*, *Agency problem* and *Risk* for the sub-samples of standalone insurance firms and insurance firms associated with banks. The pooled OLS coefficient for *Insurance dummy* is negative and significant for both sub-samples, confirming our first hypothesis that insurance firms have a lower quality of governance. We report consistent results for our risk hypothesis as we find both standalone and insurance associated with banks have a lower level of risk. Finally, we report the coefficient for *Insurance dummy* is -0.046 (insignificant) and 0.401 (significant) for insurance firms associated with banks and standalone insurance firms, respectively for *Agency problem*.

[Insert table 10]

Although insignificant, we further explain the results for the agency problem hypothesis due to the theoretical and policy implications. We cite the findings of Chernobai, Ozdagli and Wang (2021) and emphasize that the level of business complexity increases operational risk. Regulatory safeguards, for example, Gramm-Leach-Bliley Act in the United States, require banks offering insurance services to ensure transparency to their stakeholders. As such, we report insignificant agency problems for insurance firms associated with banks, highlighting the importance of both internal and external governance mechanisms for the financial sector.

4.5: Additional tests

4.5.1 Variations in insurance firms-banks governance and agency problems

We perform additional tests to extend our discussion on the governance quality, agency conflicts and risk levels for insurance firms. So far, we have empirically shown that insurance firms have inferior governance quality and suffer from a higher level of agency problem when compared to banks. Such results motivate us to perform further tests to check whether the variation in governance quality between insurance firms and banks have any impact on their agency problem. Alexander (2006) explains the role of regulation to mitigate the agency problem in the banking sector. In the absence of a uniform financial regulatory framework, we extend the discussion on corporate governance for financial institutions further by presenting the link between governance quality and agency problems for insurance firms in Table 11. *Difference in Agency problem* is the dependent variable, measured as the difference in the country-average values of *Agency problem* between the insurance firms and banks. This is done by converting firm-level data to country-level data using the mean company scores in each country. Similarly, *Difference in Governance score* is the explanatory variable of interest, calculated as the difference in the country-average values of *Governance score* between the insurance firms and banks.

We use the absolute value of the differenced values in the regressions to better explain the results. Therefore, high variation in governance quality indicates that insurance firms have inferior governance than banks. The OLS coefficient for *Difference in governance quality* is 9.751 and significant at the %5 level: namely, an increase in this difference leads to the higher agency problem. Such findings complement the findings of Chen, Yao and Yu (2007) by confirming severe agency problems for insurance firms due to weak governance mechanisms. Further, unlike Chen, Yao and Yu (2007), we ensure the generalizability of our study findings by examining a global sample of insurance firms.

We do not limit our estimate to OLS regression and repeat the regression using instrumental variables (IV) and system-GMM estimation to control for possible endogeneity problems that might exist between governance and agency problem proxies. Our results are consistent for both two-stage least squares (2SLS) and GMM estimations and ensure the robustness of the findings.

[Insert table 11]

4.5.2 Difference in insurance companies-banks governance quality, and risk and performance

Chen, Yao and Yu (2007) explain that underperformance of insurance firms is due to a higher level of agency problem which is a consequence of inferior governance quality. We observe the same findings in our analyses. After explaining the association between governance quality and agency conflicts, we examine whether governance quality affects the risk and performance of insurance firms relative to banks.

In Table 12, we report the associations among *governance quality*, *risk* and *performance* using their differenced values between insurance firms and banks, similar to Table 11 where we use averaged country-level scores. *Difference in Governance score* is the main explanatory variable in models. We report the OLS coefficient for this variable as -1.044 (significant at the

10% level) when the dependent variable is the difference in stock return volatility as proxy for additional risk for insurance firms. Our results indicate that an increase in *Difference in Governance score* reduces this additional risk, which implies that relative improvement of governance quality of the insurance firms decreases their riskiness.

Roberts & Whited (2013) conclude that the literature is plagued by endogeneity problems. We perform the Hausman-Wu test for endogeneity (Gippel, Smith, & Zhu, 2015) and the test results confirm the endogeneity problem in our regression model. We follow Shim (2017) and employ two-stage least squares (2SLS) estimation technique to address such problems. 2SLS estimation allows us to deal with a single endogenous regressor. However, Gippel, Smith and Zhu (2015) propose the use of system GMM to deal with endogeneity problems. A system GMM is useful in dealing with multiple endogenous regressors using internal instruments. For robustness, we perform both 2SLS and system GMM methods. Our findings related to risk are consistent with 2SLS and system GMM estimations and allow us to complement the findings of Klomp & De Haan (2012) that supervision in the form of a better governance mechanism affects the risk of financial institutions.

When we focus on the differenced performance measures in Table 12, we find that the OLS coefficients for *Difference in Governance score* are 1.023 and 0.048 (both are significant) when we use the difference in stock returns and difference in return on assets as performance measures, respectively. These results indicate that an increase in *Difference in Governance score* increases additional performance, which implies that relative improvement of governance quality of the insurance firms improves their performance. The corresponding 2SLS and GMM results support the OLS results. Our findings confirm the earlier results of Boyer & Stern (2012) that firms offer a higher premium to compensate for the agency problem that results from a lack of effective governance mechanism.

[Insert table 12]

Hartley (2005) employs a model with lagged variables in their study on corporate governance and performance to reduce the impact of simultaneity with a rationale that past governance and current performance does not appear in the same period. Therefore, we follow a similar approach to control for the simultaneity issues interest in the relationship between governance quality, risk and performance. We present the results in Table 13. We lag *Difference in Governance score* by one period and use it as the explanatory variable while using the differenced values (as per banks and insurance companies) of the variables regarding risk and performance as dependent variables. Such analyses would allow us to not only assess the effects of governance quality on risk and performance of insurance firms relative to banks but also apply an alternative dynamic panel estimator that is different from the set we apply in our earlier two-stage dynamic GMM estimation. While Hartley (2005) reports that lagged governance does not affect future performance, we report that our original results hold for the lagged models.

[Insert table 13]

4.6. Control variables in our analyses

We complete our analysis by discussing the impact of control variables in our empirical models. We maintain the same firm and country-level variables (Table 3 – 10) for the firm-level analysis. However, we drop firm-level control after shifting our focus to the country-level analysis. Our firm-level controls include *Age, Size and Gearing*. We include *Age* as a control following the argument that less mature firms take the higher risk (Qian & Yeung, 2015). Our results indicate that mature financial firms suffer from the lower level of *Agency problems*. However, we do not find the association between age and risk is significant for insurance firms and banks. We report that *Size* negatively affects the risk of financial firms, confirming the

findings of Qian and Yeung (2015) that mature firms have better control of risk. Our final firm-level control is *Gearing* and we find that high gearing results in better governance (Table 3), lower agency problem (Table 4), better risk management (Table 5) and improved performance (Table 6).

Our country-level controls include *GDP growth, Inflation and Country governance*. We find *GDP growth* has a positive impact on performance (Table 6 and 7). When we focus on country-level analysis, we find the association between *GDP growth* and agency problem is negative. We found similar results for *inflation in* Table 10. Country governance, however, has a positive association with agency problems and risk for financial firms. Such findings justify the selection of control variables for our empirical models.

4.5 Discussion of results

The existence of information asymmetry limits the existence of a perfect market and require a greater level of financial intermediation for better resource allocation (Chu, 1999). However, the effects of information asymmetry on financial intermediation have remained unexplored (Ferguson & Lam, 2021) and most past studies focus on exploring the impact of information asymmetry and various mechanisms to control the impact of such asymmetry for financial intermediaries (including banks and insurance firms) in isolation. Jensen and Meckling (1976) recommended good governance as an effective tool to reduce information asymmetry. However, the definition of good governance might differ based on the nature of financial intermediation. While banks provide direct intermediation through deposit and lending services, insurance firms perform such intermediation through the premium collection and investing in institutional arrangements. Therefore, the question remains as to what extent governance quality, measured using a uniform benchmark regulation, matters in financial intermediation.

We begin analysing this question by exploring any difference in governance quality between banks and insurance firms. Our preliminary results indicate that insurance firms have inferior governance quality than to banks. The banking sector has undergone massive changes in its internal and external governance structure (Peni & Vähämaa, 2012) as an aftermath of the global financial crisis. Such reform in the governance structure for the banking sector also happened after the Asian financial crisis (Choe & Lee, 2003). However, the insurance industry had an indirect impact on the global financial crisis, primarily through their investment portfolios. However, such an impact did not result in any reform in the governance structure for the insurance industry. The European Corporate Governance Institute (ECGI) database has a code of governance standards applicable for the insurance firms operating in Ireland and the Netherlands. Central banks of the rest of the world provide governance frameworks to banks and insurance companies under a common code. Our results indicate that the global insurance industry has inferior governance when we measure the quality of governance using an index that covers components prescribed by Central banks to reduce information asymmetry among the banking sector. Our results remain consistent in sub-sample analysis.

This is the first study that provides a comparative analysis of governance quality between banks and insurance companies. However, we find justification for our results from the lens of the agency theory and the conceptual arguments of Boubakri (2011) that insurance firms apply mechanisms to mitigate agency conflicts between owners and managers that are distinct from the banking sector. He and Sommer (2011) sustain such arguments and confirm that insurance firms employ additional measures of governance, for example, block ownership and takeover, to monitor managers.

We procced with our analysis by examining the extent of agency problem between banks and insurance firms. The agency theory explains that firms with good governance quality will have fewer agency problems (Jensen & Meckling, 1976). However, such a relationship is more

established for the non-financial than the financial industry. Elkelish (2018) reports that the existence of a high-level governmental regulation for the financial sector often dilutes the impact of a good governance framework on agency problems. Desender, Aguilera, López-puertas-Lamy, & Crespi (2016) have similar views and conclude that the push for better governance in the financial sector is often motivated by a different agenda (for example to attract foreign investment) than reducing agency problem. The requirement of a specific component of governance, for example, board ownership is also different depending on the level of government-guaranteed safety-net (more common for the banking industry). Our results provide further justification for the past findings as we report that insurance firms have higher agency problems when compared to banks. Such findings are in line with the propositions of agency theory (Jensen & Meckling, 1976) that firms with poor governance quality face higher agency problems.

We continue our discussion by comparing the level of risks faced by banks and insurance firms. Our results indicate that insurance firms are less risky than banks. As such, we add a new dimension to the earlier findings of Lai and Lee (2011). We provide empirical evidence that insurance firms are less risky than banks which provide further validity to the assumption that the risk-sharing approach has a direct impact on the risk-taking behaviour and insolvency costs among financial firms. Since the global financial crisis and the introduction of the Basel 3 requirement, banks face a higher level of liquidity and leverage requirements, reducing their likelihood of default and the magnitude of bank losses in default (Hugonnier & Morellec, 2017). There is evidence of a government bailout initiative to save failed banks (Gorton, 2004). Insurance firms, on the other hand, maintain a low level of risk-taking and share possible insolvency risk among the policyholders.

We examine the robustness of our study findings by (1) introducing alternative measures of risk and (2) examining risk-return relationships for both banks and insurance firms. Our results

remain consistent with an alternative measure of risk and we conclude that insurance firms are less risky than banks, possibly due to their operational structure (Hugonnier & Morellec, 2017) and risk mitigation policies (Gorton, 2004). Our results indicate that insurance firms are more profitable than banks. With reference to the prospect theory and earlier findings of Jegers (1991), we confirm that insurance firms with a return above a target level are risk-averse.

We control for possible endogeneity issues in our empirical model by performing propensity score-matched regressions, quantile regression. Also, we perform an additional test by dividing the sample of insurance firms according to their ownership structure. Our results remain consistent after controlling for endogeneity issues in the empirical model.

Finally, we provide an answer to our earlier question: Does governance matter in financial intermediation? The answer is, yes it does. Our overall analysis indicates that insurance firms have (a) lower governance quality, (b) lower risk and (c) higher return as compared to banks. However, these results do not provide any indication of whether the lower risk and higher return have any association with the governance quality of banks and insurance firms. Therefore, we conduct additional analysis to examine the impact of good governance on mitigating agency problems and risk among financial firms. Our results confirm that insurance firms face greater agency problems by enhancing their governance quality. Such results contradict the earlier propositions of Jensen and Meckling (1976) under the broader discussion of agency theory. However, our results provide further validity to the earlier findings of Boyer and Stern (2012) and Adams et al. (2010) that we cannot use a "one-size-fits-all" governance framework to study governance quality for the insurance firms. The current governance framework prescribed by the central banks around the world focuses primarily to monitor the banking industry (Gillan & Panasian, 2015). Therefore, mimicking such a framework for the insurance sector and forcing insurance firms to follow a "one-size-fits-all" type framework could have a disastrous impact on their ability to manage agency conflict.

We find that insurance firms could reduce their risk and improve their financial performance by increasing their governance quality. Our results are in line with past findings (Hsu & Petchsakulwong, 2010, Akeem et al., 2014). Therefore, we acknowledge the need for a better governance structure to improve the competitiveness of the global insurance industry. At the same time, we advocate for a unique set of governance frameworks to capture the current internal and external governance mechanisms applied by this sector to mitigate agency problems and systematic risk. We also find that past year governance quality affect future risk management capabilities and financial performance potential. Our findings are in line with Ames, Hines and Sankara (2018).

5. Conclusion

The existing corporate governance studies for the financial industry use a "one-size-fits-all" approach and generalize their findings for both banks and insurance companies. Although both banks and insurance companies are financial intermediaries, the nature of financial intermediation between these two types of firms is different. There is a unique difference between banking and insurance businesses in ownership structure and risk management approaches. However, we find limited evidence of a unique set of local or global governance standards for insurance companies. Despite the growing importance of insurance services, the extant research in insurance businesses is currently limited to efficiency analysis. Hence, we advance the debate of the need for a unique set of governance standards by providing a comparative analysis of governance quality between banks and insurance companies. We primarily aim to investigate the governance quality of insurance firms and the impact of the governance quality on risk and performance.

We perform a comparative analysis on a global sample of 774 firms (214 insurance companies and 560 banks) keeping the governance quality of the global banking sector as a benchmark. Such comparative view allows us to critically evaluate the governance quality of insurance

companies with a highly regulated banking sector that follows high standards of governance quality as an aftermath of the global financial crisis. We perform our analysis on a global sample of banks and insurance firms.

Our study has several unique findings. We report that insurance firms have inferior governance quality, higher agency problems, less risk, and high financial performance. We also find that insurance firms can mitigate risk and improve financial performance more efficiently by improving their governance quality to the current benchmark achieved by the global banking industry. However, we conclude that mimicking the current governance framework followed by the banking sector will not allow insurance firms to manage agency conflict.

Such findings have several implications for regulators and insurance industry practitioners. First, central banks around the world could take the necessary steps to address the "one-size-fits-all" approach of governance for the financial sector. We advocate for a unique set of governance frameworks for the insurance sector that addresses their complex business process to prescribe appropriate risk management strategies. Insurance industry practitioners can use our study findings to explore the possible areas of improvement in their internal control mechanisms. The global financial crisis has shaped the current governance practices for the banking sector. We strongly recommend the stakeholders take proactive steps that could protect the growth potential of the global insurance industry and restrict the potential of a future financial crisis originating from the insurance industry.

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Table 1: Sample distribution

		Full sample		Insurance		Bank	
No	Country	Firms	Observations	Firms	Observations	Firms	Observations
1	Australia	17	143	10	79	7	64
2	Austria	5	35	2	12	3	23
3	Belgium	2	20	1	10	1	10
4	Brazil	13	99	5	37	8	62
5	Canada	19	163	10	73	9	90
6	China	31	190	6	47	25	143
7	Colombia	6	42	1	10	5	32
8	Denmark	8	55	3	22	5	33
9	France	7	62	4	32	3	30
10	Germany	10	67	5	33	5	34
11	Hong Kong	13	88	6	46	7	42
12	India	22	139	5	13	17	126
13	Italy	19	152	4	40	15	112
14	Japan	33	296	7	57	26	239
15	South Korea	16	118	8	59	8	59
16	Netherlands	15	35	3	20	12	15
17	Poland	11	103	1	10	10	93
18	Saudi Arabia	13	49	3	9	10	40
19	Singapore	4	40	1	10	3	30
20	South Africa	12	118	6	59	6	59
21	Spain	10	76	2	13	8	63
22	Switzerland	14	109	5	50	9	59
23	Taiwan	17	151	5	49	12	102
24	United Kingdom	24	182	12	97	12	85
25	United States of America	433	1893	99	648	334	1245
	Total	774	4425	214	1535	560	2890

Note: We compare the governance quality of insurance companies and banks. We identify forty items that cover nine fundamental governance criteria using bibliometric review process. In the next step, we download governance and firm level data from the Datastream ASSET4 database. As we compare between insurance companies and banks, we ensure that each country has representative samples for insurance companies and banks. This sampling frame results a total number of 774 firms (214 insurance firms and 560 banks) operating in 25 countries. Our unbalanced panel covers 10 years from 2011 to 2020.

Table 2: Descriptive Statistics

	Full sample					Insurance					Bank					Mean difference	
Variables	Obs	Mean	Std. Dev.	Skewness	Kurtosis	Obs	Mean	Std. Dev.	Skewness	Kurtosis	Obs	Mean	Std. Dev.	Skewness	Kurtosis	Difference	P-value
Governance quality	4425	0.719	0.123	-0.926	3.808	1535	0.611	0.124	-0.345	2.762	2890	0.775	0.074	-0.214	2.797	-0.164***	0.000
Agency problem	3634	0.948	1.461	3.902	21.648	1271	1.408	2.023	2.783	11.071	2362	0.700	4.544	4.544	36.409	0.708***	0.000
Stock return volatility	1996	0.234	0.315	10.385	182.625	805	0.183	0.122	2.308	13.880	1191	0.269	0.392	8.785	125.141	-0.086***	0.000
Z-score	1286	3.433	0.740	-1.097	3.923	651	3.367	0.727	-1.002	3.890	635	3.502	0.748	-1.228	4.088	-0.134***	0.000
Return on asset	4380	0.017	0.024	2.552	13.092	1528	0.026	0.034	1.290	5.440	2852	0.012	0.014	4.608	43.675	0.014***	0.000
Earnings per share	4386	2.616	4.413	3.297	17.419	1528	3.671	6.126	2.380	9.110	2858	2.052	2.985	3.513	26.509	1.619***	0.000
Stock return	3597	-0.053	0.519	-14.694	409.966	1312	-0.004	0.343	-4.659	0.987	2285	-0.081	0.595	-17.662	0.869	0.076***	0.000
Market value ratio	4347	0.534	6.503	-0.981	392.043	1521	1.024	10.740	-4.130	41.530	2826	0.269	1.675	-14.780	367.539	0.754***	0.000
Insurance dummy	4425	0.347	0.476	0.643	1.413												
Age	4119	34.529	31.829	2.064	7.732	1437	29.200	27.238	2.494	11.508	2682	37.384	33.694	1.880	6.539		
Size	4382	10.631	0.833	0.135	2.396	1529	10.502	0.793	-0.122	2.344	2853	10.700	0.845	0.226	2.281		
Gearing	4382	9.951	6.022	0.904	3.930	1529	7.583	6.816	1.437	4.688	2853	11.220	5.119	1.057	4.372		
GDP Growth	2475	2.302	1.829	0.877	5.518	996	2.135	1.350	0.813	9.010	1479	2.414	2.084	-2.981	7.996		
Inflation	2475	2.034	1.802	1.550	6.208	996	1.920	1.432	1.282	6.082	1479	2.111	2.011	1.501	5.484		
Country Governance	2592	1.046	0.588	-1.272	3.663	1032	1.160	0.484	-1.689	5.710	1560	0.970	0.636	-1.027	2.876		

Note: We divide firm performance into accounting and market measure of performance. Accounting measures are return on assets (ROA) and earnings per share (EPS). Market measures are stock return and book value of equity per share. We use stock return volatility and z-score as proxies of firms' stability. We develop a governance index consisting of 40 items and use the scores for further empirical analysis. Firm level variables include age, size and gearing. Country level controls include GDP growth, inflation and country governance. Mean difference is the average value comparison of each variable between banks and insurance companies. Appendix B defines the variables.

Table 3: Do insurance companies have inferior governance quality than banks?

	Robust OLS	System-GMM
Governance quality$_{t-1}$		0.649***
		(0.000)
Insurance dummy	-0.169***	-0.058***
	(0.000)	(0.000)
Age	0.000	0.000
	(0.460)	(0.900)
Size	0.001	0.002
	(0.850)	(0.600)
Gearing	0.001***	0.001**
	(0.000)	(0.050)
GDP Growth	0.000	-0.001
	(0.990)	(0.630)
Inflation	0.003**	0.000
	(0.040)	(0.950)
Country Governance	0.022	0.002
	(0.240)	(0.590)
Constant	0.765***	0.249***
	(0.000)	(0.000)
Country FE?	Yes	*See note*
Year FE?	Yes	*See note*
Observations	2230	1984
F-Value (OLS)/Wald X^2 (GMM)	97.79***	308.24***
R-squared	0.533	
AR(1)		8.49***
AR(2)		0.86
Hansen		33.55
		(0.634)

Note: We perform OLS and two-step system GMM regressions to explore the difference in governance scores between insurance firms and banks. The dependent variable is *Governance score*. We use both firm and country-level controls in both models. Firm level controls include age, size and gearing. Country level controls include GDP growth, inflation and country governance. Standard errors are adjusted for 218 clusters in the OLS regression. The values in the parentheses are the p-values. ***, **, ** indicate significance at the 1, 5 and 10%, respectively. AR(1) and AR(2) are the first and second order autocorrelation of the residuals, respectively, which are asymptotically distributed as N(0,1) under the null of no serial correlation. Hansen is the test of overidentifying restrictions, asymptotically distributed as χ2(df) under the null hypothesis that the instruments used are valid with the absence of the overidentification problem. Table A2 defines the variables.

Table 4: Comparison of governance quality between insurance companies and banks across various sub-samples

	Panel A: Region-wise			Panel B: Income-wise		Panel C: Economic maturity		Panel D: Accounting standards	
	Asia	Europe	North America	High Income	Low Income	Advanced	Emerging	IFRS	Non-IFRS
Insurance dummy	-0.164***	-0.121***	-0.033	-0.142***	-0.160***	-0.138***	-0.189***	-0.111***	-0.217***
	(0.000)	(0.000)	(0.760)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Age	0.000	0.001***	0.001*	0.000*	0.000	0.000**	0.000	0.000*	0.000
	(0.560)	(0.010)	(0.080)	(0.080)	(0.650)	(0.040)	(0.780)	(0.060)	(0.230)
Size	-0.030*	0.016	-0.004	-0.016	0.048	-0.018	0.043	-0.017	-0.003
	(0.060)	(0.560)	(0.960)	(0.220)	(0.300)	(0.190)	(0.360)	(0.240)	(0.910)
Gearing	-0.001	-0.002	0.018*	0.002	0.003	0.002	0.002	0.003***	-0.003
	(0.400)	(0.270)	(0.070)	(0.150)	(0.290)	(0.140)	(0.470)	(0.010)	(0.140)
Credit risk	0.127***	-0.042	-0.006	-0.011	-0.012	-0.006	0.000	-0.027	0.015
	(0.000)	(0.130)	(0.950)	(0.500)	(0.730)	(0.740)	(1.000)	(0.140)	(0.610)
GDP Growth	0.010*	0.006	-0.033	0.010*	0.002	0.009*	-0.004	0.020***	-0.007
	(0.090)	(0.570)	(0.370)	(0.060)	(0.780)	(0.090)	(0.520)	(0.000)	(0.230)
Inflation	-0.007	-0.023***	0.008	-0.007	0.000	-0.008	-0.004	-0.003	-0.008
	(0.260)	(0.010)	(0.750)	(0.210)	(0.980)	(0.120)	(0.630)	(0.570)	(0.230)
Country governance	0.022	0.040	0.181	0.012	-0.001	0.032	-0.111	0.010	-0.032
	(0.290)	(0.130)	(0.660)	(0.530)	(0.990)	(0.130)	(0.240)	(0.500)	(0.250)
Constant	0.984***	0.339**	-0.157	0.678***	0.139	0.650***	0.263	0.643***	0.572***
	(0.000)	(0.050)	(0.870)	(0.000)	(0.680)	(0.000)	(0.450)	(0.000)	(0.010)
Observations	162	126	58	345	38	343	40	225	158
R-squared	0.416	0.504	0.537	0.529	0.548	0.523	0.550	0.527	0.556

Note: We perform the OLS method to explore the difference in governance scores between insurance firms and banks. *Governance score* is the dependent variable. We use both firm and country-level controls in both models. Firm level controls include age, size and gearing. Country level controls include GDP growth, inflation and country governance. We also perform two-stage system GMM and find results are consistent with OLS results. The values in the parentheses are the p-values. ***, **, ** indicate significance at the 1, 5 and 10%, respectively. Table A2 defines the variables.

Table 5: Do insurance firms have higher agency problem as compared to banks?

	Robust OLS	System-GMM
Agency problem$_{t-1}$		0.177***
		(0.000)
Insurance dummy	0.141	0.551***
	(0.600)	(0.010)
Age	-0.002***	-0.002
	(0.000)	(0.220)
Size	-0.084**	0.426**
	(0.040)	(0.030)
Gearing	-0.036***	-0.041***
	(0.000)	(0.000)
GDP Growth	0.025	0.001
	(0.140)	(0.960)
Inflation	-0.018	-0.009
	(0.380)	(0.680)
Country Governance	-0.092	0.622***
	(0.760)	(0.000)
Constant	2.236***	-4.130*
	(0.000)	(0.060)
Country FE?	Yes	*See note*
Year FE?	Yes	*See note*
Observations	1296	1660
F-Value (OLS)/Wald X^2 (GMM)	79.81***	45.97***
R-squared	0.402	
AR(1)		2.48***
AR(2)		1.60
Hansen		52.65**
		(0.057)

Note: We perform OLS and two-step system GMM regressions to examine the extent of agency problems across insurance firms and banks. The dependent variable is *Agency problem*. We use both firm and country-level controls in both models. Firm level controls include age, size and gearing. Country level controls include GDP growth, inflation and country governance. The country and year fixed effects is used in the OLS estimation based on the literature (Beck, Lin, & Ma, 2014) but is not applied to the system GMM as supporting literature is unavailable. Standard errors are adjusted for 218 clusters in the OLS regression. The values in the parentheses are the p-values. ***, **, ** indicate significance at 1, 5 and 10% level, respectively. AR(1) and AR(2) are the first and second order autocorrelation of the residuals, respectively, which are asymptotically distributed as N(0,1) under the null of no serial correlation. Hansen is the test of overidentifying restrictions, asymptotically distributed as $\chi 2$(df) under the null hypothesis that the instruments used are valid with the absence of the overidentification problem. Table A2 defines the variables.

Table 6: Are insurance stocks riskier than banks?

	Dependent variable: Risk		Dependent variable: Performance			
	Stock return volatility		Stock return		Return on assets	
	OLS	GMM	OLS	GMM	OLS	GMM
Dependent variable $_{t-1}$		0.813***		-0.034		0.639***
		(0.000)		(0.680)		(0.000)
Insurance dummy	-0.064***	-0.011	0.054**	0.057***	0.005***	0.003***
	(0.000)	(0.200)	(0.020)	(0.010)	(0.000)	(0.000)
Age	0.000	0.000	0.000	-0.001***	0.000	0.000
	(0.760)	(0.160)	(0.220)	(0.000)	(0.820)	(0.960)
Size	-0.048***	-0.021*	0.047***	0.055**	-0.008***	-0.003**
	(0.000)	(0.070)	(0.000)	(0.030)	(0.000)	(0.030)
Gearing	0.008***	0.004*	-0.006***	-0.008**	-0.001***	-0.001***
	(0.000)	(0.080)	(0.000)	(0.050)	(0.000)	(0.000)
GDP growth	0.006	0.001	-0.020	0.000	0.001*	0.000
	(0.510)	(0.780)	(0.290)	(1.000)	(0.060)	(0.370)
Inflation	0.007	0.005	-0.007	0.014	0.000	0.000**
	(0.410)	(0.430)	(0.750)	(0.250)	(0.660)	(0.050)
Country governance	-0.193	0.000	-0.220	0.042	-0.011**	-0.001
	(0.210)	(0.990)	(0.350)	(0.200)	(0.030)	(0.210)
Constant	0.851***	0.227*	0.037	-0.590**	0.127***	0.043***
	(0.000)	(0.070)	(0.930)	(0.040)	(0.000)	(0.000)
Country FE?	Yes	*See note*	Yes	*See note*	Yes	*See note*
Year FE?	Yes	*See note*	Yes	*See note*	Yes	*See note*
Observations	1481	1234	1969	1722	2230	1983
F-Value (OLS)/Wald X^2 (GMM)	10.50***	100.24***	6.67***	5.02***	167.34***	95.72***
R-squared	0.151		0.176		0.387	
AR(1)		-2.07**		-1.82		-3.57***
AR(2)		-2.10**		0.75		2.26**
Hansen		10.37		82.57***		2.82
		(0.169)		(0.000)		(0.945)

Note: We perform OLS and two-step system GMM regressions to compare performance and risk levels of the insurance firms and banks. We use both firm and country-level controls in the models.. Firm level controls include age, size and gearing. Country level controls include GDP growth, inflation and country governance. The country and year fixed effects are used in the OLS estimation based on the literature (Beck, Lin, & Ma, 2014) but is not applied to the GMM as supporting literature is unavailable. Standard errors are adjusted for 218, 198 and 146 clusters for ROA, stock return, stock return volatility OLS estimations respectively. The values in the parentheses are the p-values. ***, **, ** indicate significance at the 1, 5 and 10% level, respectively. AR(1) and AR(2) are the first and second order autocorrelation of the residuals, respectively, which are asymptotically distributed as N(0,1) under the null of no serial correlation. Hansen is the test of overidentifying restrictions, asymptotically distributed as $\chi 2$(df) under the null hypothesis that the instruments used are valid with the absence of the overidentification problem. Table A2 defines the variables.

Table 7: Are insurance stocks riskier than banks? Robustness tests with alternative measures

	Risk: Z-score		Performance: market value per share		Performance: earnings per share	
	OLS	GMM	OLS	GMM	OLS	GMM
$Performance_{t-1}$		0.575***		0.764***		0.385***
		(0.000)		(0.000)		(0.010)
Insurance dummy	-0.255***	-0.038	0.134***	0.060**	1.248***	1.070***
	(0.000)	(0.480)	(0.000)	(0.040)	(0.000)	(0.010)
Age	0.000	-0.001	0.000	0.000	0.000	-0.002
	(0.857)	(0.390)	(0.610)	(0.450)	(0.940)	(0.550)
Size	0.323***	0.176***	-0.375***	-0.139***	1.259***	0.615*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.060)
Gearing	-0.032***	-0.016***	-0.004	0.004	-0.102***	-0.085*
	(0.000)	(0.010)	(0.470)	(0.160)	(0.000)	(0.060)
GDP Growth	0.017	0.000	0.036**	0.016	0.148***	0.045
	(0.425)	(1.000)	(0.040)	(0.110)	(0.010)	(0.230)
Inflation	0.031	0.012	-0.008	0.032***	0.039	-0.084*
	(0.223)	(0.600)	(0.690)	(0.000)	(0.410)	(0.100)
Country Governance	-0.403	0.040	-0.061	0.004	-1.765**	1.042***
	(0.268)	(0.560)	(0.830)	(0.890)	(0.050)	(0.000)
Constant	0.552	-0.283	4.459***	1.475***	-10.360***	-5.320
	(0.515)	(0.590)	(0.000)	(0.000)	(0.000)	(0.110)
Country FE?	Yes	*See note*	Yes	*See note*	Yes	*See note*
Year FE?	Yes	*See note*	Yes	*See note*	Yes	*See note*
Observation	934	622	2212	1961	2230	1983
F-value (OLS)/Wald X^2 (GMM)	8.97***	18.69***	67.52***	82.21***	101.20***	18.16***
R-squared	0.104		0.283		0.311	
AR(1)		-6.31***		-4.53***		-2.98***
AR(2)		-0.96		1.00		1.10
Hansen		3.73		87.09***		76.98***
		(0.810)		(0.000)		(0.000)

Note: We perform OLS and two-step system GMM regressions to compare performance and risk levels of insurance firms and banks. Z-score is the proxy of risk. We use share price and earnings per share as proxies of market and accounting measures of performance, respectively. We use both firm and country-level controls in the models. Firm level controls include age, size and gearing. Country level controls include GDP growth, inflation and country governance. The values in the parentheses are the p-values. ***, **, ** indicate significance at the 1, 5 and 10% level, respectively. AR(1) and AR(2) are the first and second order autocorrelation of the residuals, respectively, which are asymptotically distributed as N(0,1) under the null of no serial correlation. Hansen is the test of overidentifying restrictions, asymptotically distributed as χ2(df) under the null hypothesis that the instruments used are valid with the absence of the overidentification problem. Table A2 defines the variables

Table 8: Propensity score matching

	Hypothesis 1 Governance quality		Hypothesis 2 Agency problem		Hypothesis 3 Risk	
	OLS	GMM	OLS	GMM	OLS	GMM
Lagged dependent variable		0.573***		0.669***		0.567***
		(0.010)		(0.000)		(0.000)
Industry dummy	-0.169***	-0.076*	0.372***	0.143*	-0.005***	-0.003***
	(0.000)	(0.065)	(0.000)	(0.090)	(0.000)	(0.000)
Age	0.000	0.000	0.000	-0.001	0.000	0.000
	(0.470)	(0.813)	(0.930)	(0.360)	(0.690)	(0.440)
Size	0.001	0.002	0.399***	0.140*	-0.008***	-0.002**
	(0.820)	(0.557)	(0.000)	(0.080)	(0.000)	(0.020)
Gearing	0.001***	0.001	-0.042***	-0.019***	-0.001***	-0.001***
	(0.005)	(0.273)	(0.000)	(0.000)	(0.000)	(0.000)
GDP Growth	0.001	0.001	0.016	0.008	0.001**	0.000
	(0.913)	(0.933)	(0.540)	(0.370)	(0.050)	(0.500)
Inflation	0.003*	0.000	0.044**	0.002	0.000	0.001***
	(0.051)	(0.837)	(0.020)	(0.870)	(0.600)	(0.010)
Country governance	0.021	0.004	-0.415	0.227***	-0.011**	-0.001
	(0.262)	(0.443)	(0.230)	(0.000)	(0.030)	(0.330)
Constant	0.766***	0.296*	-2.905***	-1.320	0.125***	0.034***
	(0.000)	(0.067)	(0.010)	(0.110)	(0.000)	(0.000)
Country FE?	Yes	*See note*	Yes	*See note*	Yes	*See note*
Year FE?	Yes	*See note*	Yes	*See note*	Yes	*See note*
Observation	2226	1981	1905	1658	2226	1980
R-squared	0.531		0.402		0.151	

Note: This table provides both OLS and GMM regressions for the matched samples using the PSM procedure. We use both firm and country-level controls in the models. Firm level controls include age, size and gearing. Country level controls include GDP growth, inflation and country governance. The country and year fixed effects are used in the OLS estimation based on the literature (Beck, Lin, & Ma, 2014) but is not applied to the system GMM as supporting literature is unavailable. The values in the parentheses are the p-values. ***, **, ** indicate significance at the 1, 5 and 10% level, respectively. AR(1) and AR(2) are the first and second order autocorrelation of the residuals, respectively, which are asymptotically distributed as N(0,1) under the null of no serial correlation. Hansen is the test of overidentifying restrictions, asymptotically distributed as $\chi 2(df)$ under the null hypothesis that the instruments used are valid with the absence of the overidentification problem. Table A2 defines the variables.

Table 9: Does the same results hold with quantile regression?

		Hypothesis 1	Hypothesis 2	Hypothesis 3
	Quantiles	Governance quality	Agency problem	Risk
Insurance dummy	0.10	-0.251***	0.058***	-0.194***
		(0.000)	(0.000)	(0.002)
	0.25	-0.197***	0.083***	0.452***
		(0.000)	(0.000)	(0.000)
	0.50	-0.167***	0.319***	0.812***
		(0.000)	(0.000)	(0.000)
	0.75	-0.136***	0.476***	1.569***
		(00.000)	(0.000)	(0.000)
	0.90	-0.111***	0.692**	3.400***
		(0.000)	(0.046)	(0.002)
Firm FE?		Yes	Yes	Yes
Country FE?		Yes	Yes	Yes
Observations		2230	1908	1721

Note: In this table, we provide quantile regression results for explanatory and control variables. We use both firm and country-level controls in the models. Firm level controls include age, size and gearing. Country level controls include GDP growth, inflation and country governance. The values in the parentheses are the p-values. ***, **, ** indicate significance at the 1, 5 and 10% level, respectively. Table A2 defines the variables.

Table 10: Does governance quality, agency problem and risk vary between standalone insurance firms and those associated with banks?

	Hypothesis 1	Hypothesis 2	Hypothesis 3
	Governance Quality	Agency Problem	Risk
Insurance dummy	-0.220***	-0.046	-0.002
	(0.000)	(0.297)	(0.912)
Age	0.000	-0.004***	0.000
	(0.143)	(0.000)	(0.796)
Size	-0.026***	0.010	-0.019
	(0.006)	(0.916)	(0.146)
Gearing	0.004***	-0.020***	0.002***
	(0.001)	(0.000)	(0.005)
GDP Growth	0.001	-0.020	-0.015
	(0.874)	(0.389)	(0.182)
Inflation	0.000	-0.004	-0.003
	(0.961)	(0.866)	(0.813)
Country governance	0.135	0.651	-0.173
	(0.295)	(0.135)	(0.339)
Constant	0.941***	8.762***	0.543
	(0.000)	(0.000)	(0.112)
Country FE?	Yes	Yes	Yes
Year FE?	Yes	Yes	Yes
Observations	197	182	131
R-squared	0.681	0.971	0.339

Note: In this table, we compare between standalone insurance firms and insurance firms associated with banks by splitting the sample. The dependent variable is based on governance quality, agency problem or risk levels (using share price volatility as a proxy). We provide OLS regression results with robust standard errors. We use both firm and country-level controls in the models. Firm level controls include age, size and gearing. Country level controls include GDP growth, inflation and country governance. The country and year fixed effects are used in the OLS estimation based on the literature (Beck, Lin, & Ma, 2014) but is not applied to the system GMM as supporting literature is unavailable. The values in the parentheses are the p-values. ***, **, ** indicate significance at the 1, 5 and 10% level, respectively. Table A2 defines the variables.

Table 11: Does low governance quality result in high agency problem in the insurance firms?

	Difference in Agency problem		
	OLS	2SLS	GMM
Lagged *Agency problem*			0.677***
			(0.000)
Difference in Governance score	9.751***	12.849***	3.926***
	(0.000)	(0.000)	(0.000)
GDP Growth	-0.117	-0.127	-0.145***
	(0.250)	(0.320)	(0.000)
Inflation	-0.362**	-0.373**	-0.080***
	(0.020)	(0.020)	(0.010)
Country Governance	0.472	0.397	0.155***
	(0.120)	(0.320)	(0.000)
Constant	3.076***	3.674***	1.305***
	(0.000)	(0.000)	(0.000)
Year FE?	Yes	Yes	*See note*
Country FE?	Yes	Yes	*See note*
Observations	100	100	69
R-squared	0.221	0.214	

Note: We perform regressions using country-level data to explore the influence of governance quality on agency problems, by converting firm-level data to country-level via the means scores. The dependent variable is the difference in the variable average values of *Agency problem* between the insurance firms and banks within each country. The explanatory variable of interest (*Difference in Governance score*) is the mean difference in the governance quality (*Governance score*) regarding the insurance firms and banks. The controls include GDP growth, inflation and country governance. The country and year fixed effects are used in the OLS and 2SLS estimations based on the literature (Beck, Lin, & Ma, 2014) but is not applied to the system GMM as supporting literature is unavailable. Average variance inflation factor (VIF) is 1.33, which suggests the absence of the multicollinearity problem. We account for endogeneity by employing 2SLS methodology using median of governance quality score, following literature (King, Srivastav, & Williams, 2016). The values in the parentheses are the p-values. ***, **, ** indicate significance at the 1, 5 and 10% level, respectively. AR(1) and AR(2) are the first and second order autocorrelation of the residuals, respectively, which are asymptotically distributed as N(0,1) under the null of no serial correlation. Hansen is the test of overidentifying restrictions, asymptotically distributed as $\chi 2$(df) under the null hypothesis that the instruments used are valid with the absence of the overidentification problem. Table A2 defines the variables.

Table 12: Does difference in governance quality contribute to insurance firms' riskiness?

	Dependent variable: risk			Dependent variable: performance					
	Difference in stock return volatility			Difference in stock returns			Difference in return on assets		
	OLS	2SLS	GMM	OLS	2SLS	GMM	OLS	2SLS	GMM
Dependent variable $_{t-1}$			0.606***			0.024			0.499***
			(0.000)			(0.900)			(0.000)
Difference in Governance score	-1.044*	-1.072*	-0.570***	1.023*	1.028*	1.252***	0.048**	0.038*	0.046**
	(0.086)	(0.078)	(0.000)	(0.070)	(0.090)	(0.000)	(0.032)	(0.071)	(0.011)
GDP Growth	-0.022	-0.021	-0.032***	-0.018	-0.018	-0.030	-0.001	-0.001	-0.001
	(0.343)	(0.335)	(0.000)	(0.190)	(0.320)	(0.290)	(0.128)	(0.128)	(0.318)
Inflation	0.035	0.035	0.023***	-0.038**	-0.038*	-0.039	0.001	0.003***	0.002
	(0.181)	(0.176)	(0.000)	(0.020)	(0.060)	(0.360)	(0.285)	(0.000)	(0.146)
Country Governance	-0.010	-0.010	-0.086***	-0.076	-0.076	-0.156**	-0.001	-0.000	-0.002
	(0.886)	(0.892)	(0.000)	(0.120)	(0.210)	(0.050)	(0.634)	(0.956)	(0.435)
Constant	0.448**	0.444**	0.226***	0.573***	0.574***	0.745***	0.042***	0.019***	0.018***
	(0.013)	(0.016)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.002)
Country FE?	Yes	Yes	*See note*	Yes	Yes	*See note*	Yes	No	*See note*
Year FE?	Yes	Yes	*See note*	Yes	Yes	*See note*	Yes	No	*See note*
Observations	172	172	103	96	96	43	140	140	111
R-squared	0.046	0.050		0.075	0.075		0.595	0.172	

Note: We perform regressions using country-level data to explore the influence of governance quality on change in risk and performance, by converting firm-level data to country-level via the means scores. The dependent variable is the difference in the variable average values pertaining to the risk and performance between the insurance firms and banks within each country. The explanatory variable of interest (*Difference in Governance score*) is the mean difference in the governance quality (Governance score) regarding the insurance firms and banks. The controls include GDP growth, inflation and country governance. The country and year fixed effects are used in the OLS and 2SLS estimations based on the literature (Beck, Lin, & Ma, 2014) but is not applied to the system GMM as supporting literature is unavailable. We account for endogeneity by employing 2SLS methodology using median of governance quality score, following the literature (King, Srivastav, & Williams, 2016). The values in the parentheses are the p-values. ***, **, ** indicate significance at the 1, 5 and 10% level, respectively. AR(1) and AR(2) are the first and second order autocorrelation of the residuals, respectively, which are asymptotically distributed as N(0,1) under the null of no serial correlation. Hansen is the test of overidentifying restrictions, asymptotically distributed as $\chi 2$(df) under the null hypothesis that the instruments used are valid with the absence of the overidentification problem. Table A2 defines the variables.

Table 13: Can difference in past governance quality affect variation in future agency problem and performance?

	Dependent variable: risk			Dependent variable: performance					
	Difference in stock return volatility			Difference in stock returns			Difference in return on assets		
	OLS	2SLS	GMM	OLS	2SLS	GMM	OLS	2SLS	GMM
Lagged dependent variable			0.602***			-0.059			0.606**
			(0.000)			(0.770)			(0.000)
Difference in Governance quality $_{t-1}$	-1.148*	-2.846*	-0.224*	1.351**	0.745	0.598	0.039	0.057*	0.005
	(0.076)	(0.100)	0.053	(0.030)	(0.312)	(0.460)	(0.130)	(0.052)	(0.740)
GDP Growth	-0.023	-0.021	-0.035***	-0.015	-0.024	-0.029	-0.001*	-0.001*	-0.001
	(0.365)	(0.415)	(0.000)	(0.400)	(0.301)	(0.430)	(0.100)	(0.095)	(0.380)
Inflation	0.018	0.024	0.017***	-0.032*	-0.018	-0.042	0.004***	0.004***	0.001
	(0.497)	(0.318)	(0.000)	(0.090)	(0.485)	(0.130)	(0.000)	(0.000)	(0.270)
Country governance	-0.049*	-0.016	-0.104***	-0.059	-0.007	-0.148**	0.000	-0.000	-0.002
	(0.058)	(0.858)	(0.000)	(0.300)	(0.911)	(0.040)	(0.980)	(0.918)	(0.540)
Constant	0.451**	0.167	0.307	0.620***	0.426**	0.634**	0.020***	0.023***	0.009
	(0.032)	(0.615)	(0.000)	(0.000)	(0.031)	(0.020)	(0.010)	(0.001)	(0.190)
Country FE?	Yes	Yes	*See note*	Yes	Yes	*See note*	Yes	Yes	*See note*
Year FE?	Yes	Yes	*See note*	Yes	Yes	*See note*	Yes	Yes	*See note*
Observations	150	148	150	85	150	43	120	120	110
R-squared	0.517	0.036		0.083	0.079		0.228	0.081	

Note: We perform regressions using country-level data to explore the influence of governance quality on change in risk and performance, by converting firm-level data to country-level via the means scores. The dependent variable is the difference in the variable average values pertaining to the risk and performance between the insurance firms and banks within each country. The explanatory variable of interest (*Difference in Governance score*) is the mean difference in the governance quality (Governance score) regarding the insurance firms and banks, which is lagged by one period. The controls include GDP growth, inflation and country governance. The country and year fixed effects are used in the OLS and 2SLS estimations based on the literature (Beck, Lin, & Ma, 2014) but is not applied to the system GMM as supporting literature is unavailable. We account for endogeneity by employing 2SLS methodology using median of governance quality score, following the literature (King, Srivastav, & Williams, 2016). The values in the parentheses are the p-values. ***, **, ** indicate significance at the 1, 5 and 10% level, respectively. AR(1) and AR(2) are the first and second order autocorrelation of the residuals, respectively, which are asymptotically distributed as N(0,1) under the null of no serial correlation. Hansen is the test of overidentifying restrictions, asymptotically distributed as $\chi 2$(df) under the null hypothesis that the instruments used are valid with the absence of the overidentification problem. Table A2 defines the variables.

Appendix

Table A1: Governance quality index scores

Index items	Measurement	Scores		
		Banks	Insurance	Total
Total score		0.741	0.727	0.737
Board composition				
Board background and skills	1 if company describe the professional experience of every board member, 0 otherwise.	0.911	0.937	0.920
Board member affiliations	1 if corporate affiliations for the board member is above median, 0 otherwise.	0.733	0.654	0.705
Board member membership limits	1 if the maximum number of years a board member is below the median, 0 otherwise.	0.776	0.782	0.779
Board size	1 if the board size is above the median, 0 otherwise.	0.972	0.949	0.964
Board specific skills	1 if the percentage of board members who have either an industry specific background or a financial background is above the median, 0 otherwise.	0.840	0.708	0.794
Independent board members	1 if the number of independent directors on board is above the median, 0 otherwise.	0.738	0.730	0.736
Non-executive board members	1 if the number of non-executive board member is above the median, 0 otherwise.	0.726	0.750	0.734
Corporate governance board committee	1 if the firm has a corporate governance board committee, 0 otherwise.	0.549	0.604	0.568
Average board tenure	1 if the average board tenure is below the median, 0 otherwise.	0.269	0.235	0.257
Audit committee				
Audit board committee	1 if the firm has an audit committee, 0 otherwise.	0.929	0.951	0.937
Audit committee expertise	1 if an audit committee has at least three members and at least one financial expert, 0 otherwise.	0.761	0.785	0.769
Audit committee management independence	1 if independent board members in involved in the audit committee is above the median, 0 otherwise.	0.892	0.908	0.897
Auditor tenure	1 if the number of year's current auditor is serving the firm is above the median, 0 otherwise.	0.930	0.945	0.935
Audit committee independence	1 if the percentage of independent board members on the audit committee is above the median, 0 otherwise.	0.843	0.818	0.834
Audit committee non-executive members	1 if the percentage of non-executive board members on the audit committee is above the median, 0 otherwise.	0.894	0.930	0.907
Internal audit department reporting	1 if the internal audit department report to the audit committee of the board, 0 otherwise.	0.950	0.913	0.937
Board meetings				
Number of Board Meetings	1 if the number of board meetings are above the median, 0 otherwise.	0.808	0.857	0.825
Board meeting attendance	1 if the percentage of board meeting attendance is above the median, 0 otherwise.	0.853	0.670	0.789
Board attendance	1 if the company publish information about the attendance of the individual board members at board meetings, 0 otherwise.	0.167	0.196	0.177
Duality				
CEO board member	1 if CEO is not the board member, 0 otherwise.	0.250	0.214	0.238
Chairman is ex-CEO	1 if the chairman is not the ex-CEO, 0 otherwise.	0.699	0.694	0.697
CEO-chairman separation	1 if CEO-Chairman functions are separated, 0 otherwise.	0.656	0.624	0.645
Compensation committee				
Compensation committee	1 if the firm has a compensation committee, 0 otherwise.	0.862	0.906	0.877
Compensation committee management independence	1 if independent board members are included on the compensation committee is above the median, 0 otherwise.	0.869	0.868	0.868
Committee meetings attendance	1 if the percentage of compensation committee meeting attendance is above the median, 0 otherwise.	0.753	0.682	0.728
Compensation committee independence	1 if the percentage of independent board members on the compensation committee is above the median, 0 otherwise.	0.734	0.728	0.732
Compensation Committee Non-executive Members	1 if the percentage of non-executive board members on the compensation committee is above the median, 0 otherwise.	0.979	0.959	0.972
Board member compensation	1 if the total compensation of the board members in US dollars is below the median, 0 otherwise.	0.776	0.748	0.766
Sustainability compensation incentives	1 if senior executive's compensation linked to CSR/H&S/Sustainability targets, 0 otherwise.	0.158	0.154	0.157
Nomination committee				
Nomination committee	1 if the firm has a compensation committee, 0 otherwise.	0.777	0.777	0.777
Nomination committee management independence	1 if independent board members are included on the nomination committee is above the median, 0 otherwise.	0.747	0.765	0.754
Nomination committee independence	1 if the percentage of independent board members on the nomination committee is above the median, 0 otherwise.	0.603	0.707	0.639
Nomination committee non-executive members	1 if the percentage of non-executive board members on the nomination committee is above the median, 0 otherwise.	0.632	0.629	0.631
Corporate social responsibility				
CSR sustainability committee	1 if the firm has a CSR sustainability committee, 0 otherwise.	0.392	0.440	0.409
CSR sustainability external audit	1 if the firm has a CSR sustainability external audit, 0 otherwise.	0.956	0.881	0.930
Disclosure				
CSR sustainability reporting	1 if the firm publish a separate CSR/H&S/Sustainability report or publish a section in its annual report on CSR/H&S/Sustainability, 0 otherwise.	0.448	0.491	0.463
GRI report guidelines	1 if the firm's CSR report published in accordance with the GRI guidelines, 0 otherwise.	0.991	0.924	0.968
Diversity				
Executive members gender diversity	1 if the percentage of female executive members is above the median, 0 otherwise.	0.906	0.775	0.861
Board cultural diversity	1 if the percentage of board members that have a different cultural background is above the median, 0 otherwise.	1.000	0.919	0.972
Board gender diversity	1 if the percentage of female on the board is above the median, 0 otherwise.	0.930	0.881	0.913

Note:
We use a five-step validation process, depicted in Figure A1, to develop the governance index. The first step begins with a bibliometric review using VOSviewer on 886 articles on bank and insurance governance available in SCOPUS to identify common governance measure. This step allows us to identify nine key governance themes appropriate for bank and insurance firms.

In stage 2, we verify the governance items with the code of governance for all 24 countries along with industry codes of governance published by Moody's and International Corporate Governance Network (ICGN). In stage 3, we validate the items using Cronbach's alpha, factor analysis and principle component analysis. The validation process provides a total number of forty governance items, covering nine governance areas. We follow Luo and Salterio (2014) and Black et al. (2017), and use a binary scoring mechanism. A score of 1 is awarded if the firm fulfils a criterial indicated in the governance index, and 0 otherwise. In the final stage, we extract the score from our governance index based on the following formula:

$$Governance\ score = {Score\ obtained\ by\ the\ firm}/{Maximum\ avaiable\ score}$$

Our governance index score can range from 0 to 40. The measurement criteria of each governance item and respective scores for both bank and insurance firms are available in Table A1.

Table A2. The definition of the variables

Variable	Definition
Return on assets	Net profit before tax /Total assets
Earnings per share	Net profit after tax / Number of common shares outstanding
Stock return	Annual gain from the stock
Market value ratio	Book value of equity / Number of common shares outstanding
Stock price volatility	Standard deviation of annual stock price over the 3 years
Z-score	(ROA + Capital Assets Ratio) / Standard deviation of ROA
Return on asset (ROA)	Net profit before tax / Total asset
Capital asset ratio	Total capita / Total asset
Agency problem	Dividends per share
Governance quality	Governance quality score using a self-developed index consisting of 40 items.
Insurance dummy	Dummy variable: 1 if the firm is an insurance company, 0 otherwise
Age	Natural log of number of years since the incorporation of the firm
Size	Natural logarithm of total assets
Gearing	Non-equity liabilities /Total equity
GDP growth	Annual growth of the gross domestic product
Inflation	Annual growth in consumer price index
Country governance	Country level governance score provided by World Bank, range between -2.5 to 2.5. Higher values correspond to better outcomes.

Table A3: Country-level comparison of governance, agency and performance between insurance companies and banks

Table C1: Year-wise mean statistics of country-level governance, agency problem and return

Year	Bank Governance	Insurance Governance	Bank stock return	Insurance stock return	Bank agency problem	Insurance agency problem
2012	0.792	0.643	0.143	0.157	0.822	1.087
2013	0.794	0.645	0.095	0.152	0.775	1.302
2014	0.793	0.647	-0.089	-0.039	0.620	1.214
2015	0.790	0.729	-0.264	-0.099	0.640	1.338
2016	0.799	0.637	-0.059	-0.037	0.749	1.199
2017	0.794	0.655	0.184	0.192	0.922	1.394
2018	0.791	0.651	-0.397	-0.207	1.019	1.510
2019	0.795	0.646	0.017	0.069	1.075	1.434

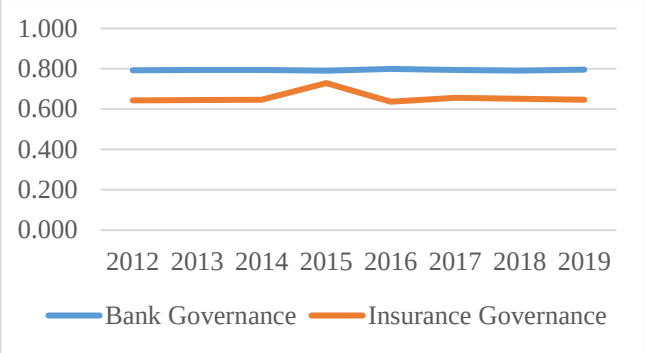

Figure C1

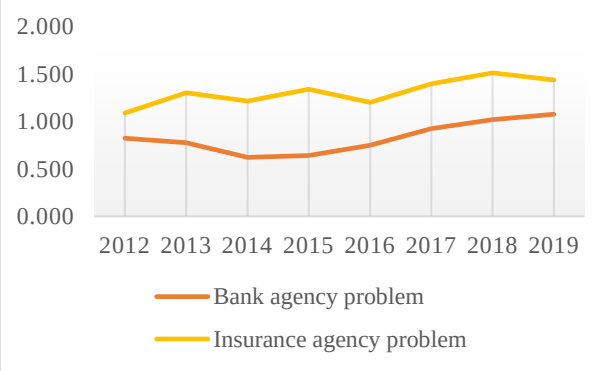

Figure C2

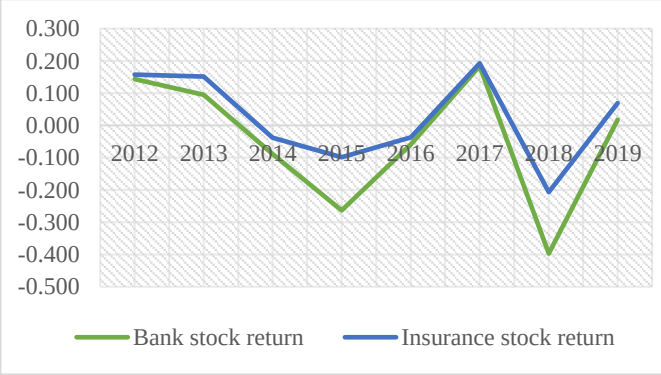

Figure C3

Note: In Table C1, we convert firm level governance, agency problem and performance data to country-level through mean transformation. The table presents year-wise mean statistics of governance, agency problem and performance statistics for bank and insurance companies. Such statistics is graphically presented to provide a comparative outlook of the country-level difference in key statistics between insurance companies and banks. Figure C1, C2 and in Panel B depicts the difference in governance quality, agency problem and performance between insurance companies and banks.