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Published

2021

Journal Title

Applied Economics Letters

Version

Accepted Manuscript (AM)

DOI

10.1080/13504851.2020.1869160

Bank performance during the credit crisis: Evidence from Asia-Pacific countries

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Abstract

This paper investigates the determinants of the stock performance of small and medium banks across Asia-Pacific countries during the global financial crisis of 2007–2008. We find that small and medium banks with more Tier 1 capital, more deposits, more liquid assets, and less funding fragility performed better during the crisis. We also find differences in banking regulations across countries are generally uncorrelated with the performance of small and medium banks during the crisis. Furthermore, there is no systematic evidence that better bank governance is associated with better performance of small and medium banks during the crisis.

JEL Classification Codes: G01 G21 G28

Keywords: Credit crisis, Bank performance, Bank fragility, Governance

*Acknowledgments: We are grateful to the Editor, Mark Taylor, and the anonymous referee for many helpful comments and suggestions. We thank Jonathan Batten and Silvio Contessi for helpful comments that have improved the paper. This research is funded by National Economics University, Hanoi, Vietnam [Grant number 154/QĐ-ĐHKTQD]. The usual disclaimers apply. Corresponding author: Hung Nguyen, Massey University, North Shore, Auckland 0745, New Zealand, Telephone: +64 9 213 6157, Email: h.nguyen3@massey.ac.nz.

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Abstract

This paper investigates the determinants of the stock performance of small and medium banks across Asia-Pacific countries during the global financial crisis of 2007–2008. We find that small and medium banks with more Tier 1 capital, more deposits, more liquid assets, and less funding fragility performed better during the crisis. We also find differences in banking regulations across countries are generally uncorrelated with the performance of small and medium banks during the crisis. Furthermore, there is no systematic evidence that better bank governance is associated with better performance of small and medium banks during the crisis.

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Data availability: Data are available from the data sources identified in the paper.

1. Introduction

During the global financial crisis of 2007–2008, a non-trivial number of financial institutions performed poorly and even collapsed or were bailed out by governments. However, not all banks performed equally poorly during the crisis (Gropp and Köhler, 2010). In a seminal study, Beltratti and Stulz (2012) document that, among large banks, those with more Tier 1 capital, more deposits, and less funding fragility performed better during the crisis. While their findings provide influential contributions in understanding variations in bank performance, the results for large banks are not necessarily representative of all banks, especially for small and medium banks, which are more vulnerable during the credit crisis compared to their larger counterparts. In addition, whether banks' pre-crisis characteristics and governance are associated with their post-crisis performance remains under-investigated.

Motivated by the seminal work of Beltratti and Stulz (2012), this paper investigates the determinants of the stock performance of small and medium banks across Asia-Pacific countries during the crisis. This study extends the work of Beltratti and Stulz (2012) in the following directions. First, this study focuses on small and medium banks, which are important segments of the economy, especially in emerging markets. More importantly, these banks are likely to be more vulnerable during the credit crisis compared to their larger peers (Mody and Wolff, 2015),[1] which may result in large variations in the cross-section of stock performance of small and medium banks across countries. This study, by focusing on small and medium banks, therefore, provides more insights into the findings of Beltratti and Stulz (2012).

Second, this study focuses on the Asia-Pacific region because it is one of the main growth drivers of the world economy, accounting for about two-fifths of global economic growth (World Bank, 2015) and there are several "high-performing economies" located in this area (Thompson, 2005). Interestingly, the Asia-Pacific region provides an ideal setting to study the performance of small and medium banks, because these banks play important roles in the economies of a region where many developing countries are located.[2]

[1] We thank the referee for this suggestion.

[2] Focusing on small and medium banks in Asian-Pacific countries also allows us to examine bank performance in a number of countries that are interesting, but are not investigated in Beltratti and Stulz (2012). These countries are Indonesia, Thailand, the Philippines, Pakistan, and New Zealand.

Third, Beltratti and Stulz (2012) suggest that large banks with certain characteristics tend to perform better during the crisis period. However, whether, and to what extent, banks' characteristics and governance in the pre-crisis period are associated with their post-crisis performance remains under-explored. This study, by focusing on the performance of banks both during and after the crisis, attempts to answer this question.

Forth and finally, Beltratti and Stulz (2012) suggest that banks with more shareholder-friendly boards, which are considered as better-governed banks, generally fared worse during the crisis. Other studies (e.g., Cornett, McNutt, and Tehranian (2010) and Minton, Taillard, and Williamson (2011)), however, argue that better corporate governance is positively related to banks' crisis performance. Recent studies such as Berger, Imbierowicz, and Rauch (2016) and De Haan and Vlahu (2016) suggest that governance matters for bank failures during the financial crisis. While governance may not affect the performance of large banks during the crisis, as documented in Beltratti and Stulz (2012), this finding does not necessarily hold for small and medium banks, given the different natures of banks in the Asia-Pacific region. Therefore, research that examines the role of governance in understanding the performance of small and medium banks during the crisis is demanded. Therefore, the results of this study contribute to the literature on the role of governance on bank performance.

We focus on small and medium banks across the Asia-Pacific with assets less than $50 billion at the end of 2006. Our sample consists of 234 small and medium deposit-taking banks in 12 Asia-Pacific countries with assets less than $50 billion as of December 2006. The findings of this study can be summarized as follows. First, we find that banks reliant on short-term finance before the crisis performed worse during the crisis. In addition, small and medium banks that relied more on deposits for their financing in 2006 fared better during the crisis. Second, the results from both equality-means tests and multiple regressions suggest that small and medium banks that performed worse during the crisis had, on average, more leverage, more funding fragility, lower Tier 1 ratio, and less liquid assets. Third, we find no systematic evidence to support the view that stronger regulation led to better performance by small and medium banks during the crisis. However, we find some evidence that banks from countries that had more restrictions on banks in 2006 performed better during the crisis. We further document a significantly negative relation between restrictions on bank activities and bank risk. Fourth, we find no systematic evidence that

bank governance helps explain bank performance during the crisis. Finally, we find no evidence that banks' characteristics and bank-level governance in the pre-crisis period or during the crisis affect banks' post-crisis performance.

Our results are robust to various robustness tests. Specifically, we re-estimate regressions after excluding banks in Japan to ensure that the findings are not driven by a large proportion of Japanese banks in the sample. Second, we repeat the main regressions using alternative definitions of the crisis period. Third, following Aebi, Sabato, and Schmid (2012), we consider alternative measures of bank performance. Specifically, we use two measures of bank profitability during the crisis (*i.e.,* return on equity (*ROE*) and return on assets (*ROA*)). Finally, we use three alternative measures of bank governance (*i.e.,* large shareholder dummy, the board size, CEO/Chairman dummy) that are employed in recent banking studies (e.g., Laeven and Levine (2009), Fahlenbrach and Stulz (2011), Erkens, Hung, and Matos (2012), Aebi, Sabato, and Schmid (2012)).

Our paper contributes to two strands of the literature. First, we add to the large body of literature focusing on bank performance during the crisis. We find that pre-crisis characteristics of small and medium banks in 12 Asia-Pacific countries are associated with their post-crisis performance. Second, we contribute to an ongoing strand of literature on sustainable bank management and performance. As a recent COVID-19 pandemic has disrupted global economies (United Nations, 2020) and potentially leads to the 2008-style bank crisis,[3] lessons from the global financial crisis of 2007–2008 would be invaluable in mitigating the negative consequences of major upheaval and contributing to the sustainable bank management and performance.

The remainder of this paper is organized as follows. Section 2 describes data, key variables measures, and summary statistics. Section 3 discusses the determinants of bank performance during the crisis. Section 4 discusses the post-crisis performance. Section 5 concludes the paper.

2. Data, variables, and summary statistics

[3] Forbes (2020): How COVID-19 leads to 2008-style bank crisis. Available at https://www.forbes.com/sites/patrickwwatson/2020/03/16/how-covid-19-leads-to-2008-style-bank-crisis/#5747a15c5b77. (Retrieved on May 20, 2020).

2.1. Data

We obtain data on financial institutions and bank balance-sheets from Bankscope. Since we focus on small and medium banks, we consider institutions with assets less than $50 billion at the end of 2006. We follow Beltratti and Stulz (2012) and consider only deposit-taking and loan-making banks. We obtain banks' monthly stock returns from Datastream, board attributes from Institutional Shareholder Service (ISS), and use country-level indicators developed by Kaufmann, Kraay, and Mastruzzi (2009) as proxies for country-level governance. We follow Barth, Caprio, and Levine (2008) and use data from the third survey of bank regulation conducted by the World Bank to measure bank regulation variables. We use the anti-director index developed by La Porta, López de Silanes, Shleifer, and Vishny (1998) and Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2008) as a proxy for shareholder protection. Finally, we obtain the gross domestic product (GDP) per capita, current account balance to GDP, and the concentration of banking sector measured as the ratio of the asset of the three largest banks divided by the total assets of banking sector from World Bank data. Our final sample consists of 234 small and medium deposit-taking banks in twelve Asia-Pacific countries. We present the definition for all variables in this study in Appendix A and report the summary statistics for cross-country characteristics in Appendix B.

2.2. Key variables and descriptive statistics

Following the banking literature (e.g., Fahlenbrach and Stulz, 2011; Erkens et al., 2012), we measure a bank's performance using the buy-and-hold dollar stock return and focus on the return during the crisis period. We follow Beltratti and Stulz (2012) and Aebi et al. (2012) and define the period from the middle of 2007 to the end of 2008 as the crisis period.[4] Table 1 reports the summary statistics for all variables used in this study.

{INSERT TABLE 1 HERE}

The average and the standard deviation of buy-and-hold dollar returns for small and medium banks in 2006 are -2.98% and 8.44%, respectively. During the crisis period, the average buy-and-hold dollar return is notably poor at -30.88% for small and medium banks. The minimum, maximum, and standard deviation of buy-and-hold returns for small and medium banks are -100%,

[4] We also consider alternative definitions of the crisis period as a part of the robustness checks in the Online Appendix.

200%, and 38.76%, respectively. Compared to the returns for large banks in the same period that are documented in Beltratti and Stulz (2012), the returns for small and medium banks tend to be more volatile.[5]

We follow Acharya, Gujral, Kulkarni, and Shin (2011) and use two different variables to capture the capital ratios of banks: (1) *Tier 1*, defined as the ratio of Tier 1 capital to total risk-weighted assets; and (2) *Tangible equity*, defined as the ratio of tangible equity to total assets. The average *Tier 1* capital in the sample is 8.84% of risk-weighted assets, which is more than twice the Basel 1 requirement, whereas, the lowest value of the Tier 1 ratio, 4.99%, exceeds the Basel I requirement. The mean and standard deviation of *Tangible Equity* in our sample is 10.21% and 7.85%, respectively. To capture the composition of a bank's liabilities, we use *Deposit*, defined as the ratio of deposit to assets, and a measure of *Funding Fragility* from Demirgüç-Kunt and Huizinga (2010).[6] The range of *Deposit* is wide, with the lowest value being 21.65% and the highest value being 95.10%. In our sample, *Funding Fragility* has a mean of 24.79% and a standard deviation of 35.97%.

We use several variables to characterize the asset side of the banks. First, we use *Loans*, defined as the ratio of loans to total assets. The range of *Loans* is extremely wide, with the lowest value being 11.51% and the highest value being 91.29%. Second, we use *Other earning assets*, which is defined as the ratio of derivatives and other securities to loans plus other earning assets. In our sample, the median value of *Other earning assets* is 24.25% and its corresponding standard deviation is 15.37%. Third, we use *Liquid asset,* which is measured as the ratio of liquid assets to total assets. *Liquid asset* has a median of 7.35% and a standard deviation of 12.91%. Finally, we follow Laeven and Levine (2009) and use *Non-interest income* and *Income diversity* as measures of the extent to which a bank's activities are diversified away from traditional banking and loan business. The average values of *Non-interest income* and *Income diversity* in our sample are 24.46% and 0.14, respectively. By way of comparison, the average values of *Non-interest income* and *Income diversity* for small and medium banks are substantially higher than those for large

[5] Beltratti and Stulz (2012) report that the maximum, minimum, and standard deviation of buy-and-hold returns for large banks for the same period are -99%, 29.14% and 27.74%, respectively.
[6] Funding fragility is defined as deposits from other banks, other deposits plus money markets and short-term funding.

banks in the sample of Beltratti and Stulz (2012).[7] We follow Laeven and Levine (2009) and use a bank's distance to default (denoted *Log Z*) as the measure of risk. A higher *log Z*, the larger the negative return required to render the bank insolvent. In our sample, *Log Z* has a minimum value of 0.10, a maximum value of 4.47, and a standard deviation of 0.9.

Bank regulation plays an important role in understanding bank performance, especially in an economic downturn. We, therefore, use the third survey of bank regulation data conducted by the World Bank to measure bank regulation variables.[8] Potential moral hazard induced by deposit insurance receives increasing attention from both academics and practitioners. Prior studies suggest that explicit deposit insurance is associated with less bank stability (Demirgüç-Kunt and Detragiache, 2002). We, therefore, examine whether small and medium banks perform worse during the crisis in countries with explicit deposit insurance. We obtain data for the existence of an explicit insurance scheme from Laeven, Demirgüç-Kunt, and Karacaovali (2005). Seven countries in our sample have explicit deposit insurance.

Prior studies provide mixed evidence of the association between bank governance and bank performance.[9] This study, by focusing on the influence of governance on the performance of small and medium banks in the Asia-Pacific region, provides more insights into the current literature. To measure bank governance, we follow Aggarwal et al. (2010) and construct a board index by aggregating 25 board attributes that are obtained from the Institutional Shareholder Service (*ISS*) dataset. Board attributes capture aspects of the functioning of the board of directors that relate to board independence, board size, transparency, and the composition of committees.[10]

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[7] The average value of *non-interest income* and *income diversity* for large banks in the same period are 41.25% and 0.53, respectively, according to Beltratti and Stulz (2012).

[8] The survey consists of questions sent to regulators and received responses from 142 countries. The four key indices used in our analysis are *Official*, *Capital*, *Restric*t, and *Private monitoring*. Definitions of these indices are available in Appendix A.

[9] On the one hand, several studies argue that among poorly-governed banks, bank executives have an incentive to take more risks that are not in the best interest of shareholders (Diamond and Rajan, 2009), which may lead to the subsequent poor performance. To that extent, one can expect that poor bank governance leads to poor performance during the crisis. On the other hand, a body of extant literature, pioneered by Merton (1977), suggests that poor governance can lead executives to take fewer risks to protect their private benefits from control (see, for example, John, Litov, and Yeung (2008)). To that extent, banks with better governance might take more risk, leading to their poor performance during the crisis.

[10] In the Online Appendix, we consider three alternative measures of corporate governance and our findings are robust to different measures of governance.

To examine the association between country-level governance and bank performance, we use country-level indicators developed by Kaufmann et al. (2008) as proxies for country-level governance. Specifically, we follow Kaufmann et al. (2008) and Beltratti and Stulz (2012) and use the mean of the six governance indices as a measure for each country's governance (denoted as *Institution*).[11] A higher value of *Institution* indicates better country governance and better institutions. In our sample, *Institution* has a maximum of 1.78 (New Zealand), a minimum of -0.97 (Pakistan), and its standard deviation of 0.95. We also measure shareholder protection using the anti-director index (*ADRI*) of La Porta et al. (1998), as revised in Djankov et al. (2008). A higher value of ADRI implies better shareholder rights. In our sample, Thailand has the lowest value (*ADRI*=2), while Singapore and India have the highest value (*ADRI*=5).

Finally, we use World Bank data to obtain several measures for macroeconomic variables, including a country's gross domestic product (GDP) per capita, current account balance to GDP, and the concentration of the banking sector (denoted as *Concentration*).[12] *Concentration* has a wide range, with a minimum of 33%, a maximum of 86% and a standard deviation of 8.02%.

3. Determinants of bank performance during the crisis

3.1. Characteristics of the worst- and best-performing bank during the crisis

We first divide the whole sample into the top and bottom quartiles of return performance from July 2007 to December 2008. We then compare the characteristics of the banks that had the worst performance (bottom quartile) and those that had the best performance (top quartile) during the crisis. Table 2 compares the characteristics of small and medium banks in the bottom quartiles of stock return performance relative to those in the top quartile of stock return performance.

{INSERT TABLE 2 HERE}

During the crisis period, the average return for small and medium banks in the bottom quartiles was -58.70%, whereas, that for banks in the top quartile was -6.86%. Banks that

[11] The six governance indices are voice, political stability, government effectiveness, regulatory quality, rule of law, and corruption. Others to use the country governance indices include Djankov et al. (2008) and De Haas and Van Horen (2012).

[12] We follow Gorton and Rosen (1995) and Beltratti and Stulz (2012) and use *Concentration* as a proxy for the value of bank franchises because a more concentrated bank system allows banks to earn monopoly rents.

performed poorly during the crisis also had a lower return in 2006, as their average return was -5.03%. In contrast, banks that performed better during the crisis had a slightly higher average return of -1.40% in 2006.[13]

Consistent with Beltratti and Stulz (2012), the best-performing (top quartile) banks had significantly more equity and hence lower leverage at the end of 2006. There is a statistical difference in the ratio of deposit to assets between the best-performing (top quartile) and the worst-performing (bottom quartile) banks. Specifically, at the end of 2006, the deposit-to-asset ratio (*Deposit*) was 44.50% for the top quartile banks and 15.19% for the bottom quartile banks. Neither income diversity nor the ratio of loans to assets is statistically different between banks in the top and bottom quartiles for stock returns. In addition, there is no statistical difference in the distance to default measure (*Log Z*) between the two groups of small and medium banks. Besides, the best-performing banks (top quartile) had lower funding fragility and more liquid assets, compared to their counterparts in the bottom quartile.

There is no clear evidence that the better-performing banks come from more-tightly regulated countries (*i.e.*, countries with more powerful supervisors, more restrictions on capital, more private monitoring). Neither the anti-director index (*ADRI*) nor differences in institutional environments (*Institution*) are statistically different between the two groups of banks. Interestingly, compared to banks in the bottom quartile, banks in the top quartile (the best-performing) operated in countries with higher restrictions on banking activities. More specifically, at the end of 2006, the average value of *Restricts* was 10.34 for the top quartile banks and 7.81 for the bottom quartile banks. Beltratti and Stulz (2012) find that the worst-performing large banks tend to have a more shareholder-friendly board. When it comes to small and medium banks, there is no significant difference between best-performing and worst-performing small and medium banks with regards to shareholder-friendly boards *(Board*). Finally, more poorly performing banks come from countries with higher GDP per capita (*Log GDP*) and with higher bank concentration (*Concentration*). There is no statistical difference in the current account between the two groups of banks. Overall, the results presented in Table 2 suggest that the worst performers during the

[13] The findings for small and medium banks are different from those for large banks. Beltratti and Stulz (2012) find large banks that performed better during the crisis had lower average returns in 2006.

crisis had, on average, in 2006, more leverage, more funding fragility, lower Tier 1 ratio, less deposits, and less liquid assets.

3.2. Regression analysis

We further examine the relation between bank characteristics and bank performance using multiple regressions. Table 3 reports the regression results for testing the relation between the characteristics of a bank before the crisis period and its performance during the crisis for the sample of small and medium banks. The dependent variables are banks' buy-and-hold stock returns over the period of July 2007 - December 2008. As reported in Table 3, we use country fixed effects in Panel A and country regulatory and macroeconomic variables in Panel B.

{INSERT TABLE 3 HERE}

Columns (1) and (2) of Panel A report the results for all banks in the sample; whereas, Columns (3) and (4) report the results for the subsample, which excludes Japanese banks. Considering this subsample serves two purposes. First, Japanese banks contribute a significant proportion of the whole sample, and hence, one can argue that our findings could be largely driven by Japanese banks. Second, prior research suggests that many emerging Asian economies do not have well-developed capital markets and, thus, remain heavily dependent on their banking systems to finance economic growth (Miller, 1998). Japan, however, is a well-developed market. Prior studies generally consider Japan as a separate case since it tends to be a supplier of credit to the region, and has different and more complex corporate structures than other countries in Asia (Rhee and Posen, 2013). In addition, a recent study by Hoshi and Kashyap (2010) shows that there are many similarities in fiscal policies between Japan and the US, especially during the financial crisis. Therefore, considering the sample with and without Japanese banks is of utmost importance in ensuring the robustness of the findings.

According to the results of Column (1) of Panel A, the Tier 1 ratio has a positive and significant coefficient (0.0899), suggesting that banks with a higher Tier 1 ratio are more likely to perform better during the crisis. The coefficient of *Deposit*, 1.5977, is statistically significant at the 1% level, indicating the positive relation between bank deposits and stock returns during the crisis. A negative and significant coefficient of *2006 return* suggests that banks performing better

in 2006 experienced worse returns during the crisis. The coefficient of *Non-interest*, 0.6156, is statistically significant at the 5% level, indicating a positive relation between the bank's non-interest income before the crisis and its performance during the crisis. However, the coefficients of *Loan*, *Log asset*, and *Log Z* are not statistically distinguishable from zero.

The regression in Column (2) of Panel A replaces *Deposit* with the measure of funding fragility. A negative and significant coefficient of funding fragility, -0.0847, indicates that banks that are more vulnerable to runs on short-term funding performed more poorly. The results of Columns (3) and (4) suggest that excluding Japanese banks does not alter the findings. Specifically, the coefficients of *Tier 1*, *Deposit*, and *Non-Interest* are positive and statistically significant at the 5% level or better, indicating the positive relation between a bank's Tier 1 capital ratio, deposit, and non-interest income in 2006 and bank performance during the crisis. Consistent with the results of Column (2), in Column (4) we find a negative and significant coefficient of funding fragility, -0.5795, indicating that banks that are more vulnerable to runs on short-term funding performed more poorly.

In all model specifications in Panel A, the coefficients of *Board* are not statistically distinguishable from zero, which suggests that there is no significant relation between bank governance, measured by shareholder-friendly boards, and the performance of small and medium banks. An explanation for this is that a majority of small and medium banks in Asia-Pacific region are family-owned banks (OECD, 2000). Given this specific nature of banks in Asia and the fact that not all board members actively participate in banks' activities and supervision (Jiraporn, Singh, and Lee, 2009), one may expect no significant relation between bank governance and bank performance. The findings in Table 3 are consistent with the results on the equality of mean testing in Table 2, consistently suggesting no significant difference in the measure of shareholder-friendly boards between the best-performing and the worst-performing small and medium banks. This finding is also consistent with Beltratti and Stulz (2012), which shows that bank governance generally cannot explain the poor performance of large banks.

In Panel B of Table 3, we use country regulatory and macroeconomic variables instead of country-fixed effects. The results of Panel B are highly consistent with those of Panel A. Specifically, the coefficients of *Tier 1*, *Deposit*, and *Non-Interest* are both positive and statistically significant at the 5% level or better; whereas, the coefficient of *Funding Fragility* is negative and significant at the

5% level. In addition, there is no supporting evidence that bank governance, measured by shareholder-friendly boards, affects the performance of small and medium banks during the crisis, as the coefficients on *Board* are not statistically distinguishable from zero. In addition, the current account has significantly positive coefficients in all specifications in Panel B. The coefficients on regulation and institution variables, however, are not statistically significant at the 5% level. Interestingly, in all Columns in Panel B of Table 3, the coefficients on *Restrict* are positive and statistically significant at the 5% level, suggesting that banks from countries with more restrictions on banks in 2006 perform better during the crisis.

We further investigate whether bank risk in 2006 is associated with bank- and country-characteristics. This analysis is important in understanding the positive relation between bank performance and restrictions on bank activities. One possible interpretation is that more restrictions on bank activities led banks to take fewer risks before the crisis, eventually leading to better performance of banks during the crisis. To test this possibility, we estimate regressions similar to those in Table 3 and use distance-to-default, a measure of bank risk, as the dependent variable. We also use country-fixed effects to control for unobserved factors for each country. The test results are presented in Table 4. Specifically, the coefficient on *Restrict,* -4.8564, is negative and statistically significant at the 5% level, suggesting more restrictions on bank activities led banks to take less risk before the crisis, which results in better bank performance during the crisis.

{INSERT TABLE 4 HERE}

4. Post-crisis performance

Do banks' pre-crisis characteristics and governance associate with bank's post-crisis performance? We attempt to answer this question by running the same regressions as in Table 3 with two adjustments. First, the dependent variable is a bank's post-crisis performance, measured by that bank's buy-and-hold stock return over the period from January 2009 to December 2014. Second, we replace *2006 return* with the bank performance during the crisis (*2007-2008 return*), measured by the bank's buy-and-hold stock return over the period from July 2007 to December 2008. We use similar control variables as in Table 3. We consider the sample with and without Japanese banks to ensure that our findings are not driven by the large proportion of Japanese banks

in the sample. Furthermore, we include country fixed effects in the regressions to control for unobserved factors in each country. The regression results are reported in Panel A of Table 5.

{INSERT TABLE 5 HERE}

Overall, Panel A's results suggest no significant relation between banks' characteristics, bank-level governance during the crisis, and those banks' post-crisis performance. Specifically, neither the Tier 1 ratio nor Deposit have significant coefficients. Similarly, the coefficients on Funding Fragility, Non-interest income, and Board are not statistically distinguishable from zero. Unsurprisingly, the positive coefficients on the *2007-2008 return* suggest a positive relation between during-crisis performance and post-crisis performance. However, the relation is statistically weak, with the coefficients statistically significant only at the 10% level.[14]

Furthermore, we examine whether a bank's characteristics and bank-level governance during the crisis are associated with their post-crisis performance. We repeat the regressions in Panel A of Table 5 with the same dependent variable; a bank's post-crisis performance, measured by the bank's buy-and-hold stock return over the period from January 2009 to December 2014. All control variables, including bank characteristics and bank governance variables, are now estimated over the period from 2007-2008. The results for these regressions are presented in Panel B of Table 5. We find no supporting evidence that banks' characteristics and governance during the crisis affect banks' post-crisis performance.[15]

5. Conclusion

This paper investigates the determinants of the stock performance of small and medium banks across Asia-Pacific countries during the period from the beginning of July 2007 to the end of December 2008. It is important to note that this study does not examine why the crisis happened. Instead, it mainly focuses on whether the performance of small and medium banks is associated

[14] In tabulated results, we repeat the regressions in Panel A of Table 5 with the bank's post-crisis performance measured over a shorter period. Specifically, the post-crisis performance of a bank is measured by the bank's buy-and-hold stock return over the period from January 2009 to December 2010. The results are qualitatively unchanged.

[15] In the Online Appendix, we conduct a set of sensitivity analyses to ensure that the findings are robust. First, we repeat the main regressions using alternative definitions of the crisis period. Second, we use alternative measures of bank performance. Finally, we use three alternative measures of bank governance. Our results are robust to sensitivity analyses.

with a bank's balance sheet characteristics and bank-level governance before the crisis. We find that small and medium banks with more Tier 1 capital, more deposits, more liquid assets, and less funding fragility performed better during the crisis. This finding is aligned with the findings of Beltratti and Stulz (2012). Differences in banking regulations across countries are generally uncorrelated with the performance of small and medium banks during the crisis. We find no systematic evidence that stronger regulation led to better performance of small and medium banks during the crisis. However, we find some evidence that banks from countries with more restrictions on bank activities fared better. Macroeconomic imbalances were not related to bank performance during the crisis. Overall, our paper suggests that pre-crisis characteristics of small and medium banks in 12 Asia-Pacific countries are related to their post-crisis performance.

There is no supporting evidence for the prediction that better bank governance is associated with better performance of small and medium banks during the crisis. One possible explanation for this finding is based on the specific nature of banks in Asia. As a considerable number of small and medium banks in the Asia-Pacific region are family-owned banks and, given the fact that not all board members actively participate in a bank's activities, future studies may consider another regional setting for small and medium banks (e.g., a sample of European small and medium banks). The findings of this study are consistent with the evolution of the Basel III framework which focuses on strengthening the quality of bank regulatory capital (with a greater focus on Tier 1 capital), increasing the capital requirements for banks' resiliency in times of stress, and mitigating liquidity risk and maturity transformation (Bank for International Settlements, 2017, pages 1-2). Bank management and supervisory authorities may consider the findings of this paper in their crisis management planning for the resilient banking system. Furthermore, academics, practitioners, and regulators might consider the findings of this paper to better mitigate the adverse impacts of the recent COVID-19 pandemic on sustainable bank performance.

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Appendix A. Variables definition and measures.

Variable	Definition and Estimation
Tier 1	The ratio of Tier 1 capital to total risk-weighted assets.
Tangible equity	The ratio of tangible equity to total assets.
Deposit	The ratio of deposit to assets
Loans	The ratio of loans to total asset
Other earning assets	The ratio of derivatives and other securities to loans plus other earning assets
Liquid asset	Measured as the ratio of liquid assets to total asset
Non-interest income	The share of operating income not due to interest income.
Income diversity	Income diversity is defined as one minus the absolute value of the ratio of the difference between net interest income and other operating income to total operating income,
Distance-to default	Distance to default (*Log Z*) is measured as the ratio of the return on assets plus the capital-asset ratio divided by the standard deviation of the return on assets.
Funding Fragility	Defined as deposits from other banks, other deposits plus money market and short-term funding.
Official	An index of the power of the commercial bank supervisory agency, including elements such as the rights of the supervisor to meet with and demand information from auditors, to force a bank to change the internal organizational structure, to supersede the rights of shareholders, and to intervene in a bank
Capital	An index of regulatory oversight of bank capital, including indicators for whether the sources of funds that count as regulatory capital can include assets other than cash and government securities, and whether authorities verify the source of capital;
Restrict	An index of regulatory restrictions on the activities of banks, consisting, for example, of limitations in the ability of banks to engage in securities market activities, insurance activities, real estate activities, and to own nonfinancial firms
Private monitoring	An index that measures the degree to which regulations empower, facilitate, and encourage the private sector to monitor banks
Deposit insurance	A dummy variable equal to 1 where there is an explicit deposit insurance
Board	Board index, constructed by summing 25 board attributes that are obtained from Institutional Shareholder Service (*ISS*) dataset.
Board size	Measured as the natural logarithm of the number of directors on a bank's board
CEO/Chairman	A dummy variable whether the CEO is also the chairman of the board of directors
Large shareholder	A dummy variable which is equal to 1 if a firm has a large owner with direct or indirect voting rights greater than 10% and 0, otherwise, measured using ownership data from Bureau van Dijk.
Institution	A measure for each country governance. Institution is measured by the average values of six governance obtained from Kaufmann et al. (2008). Six governance indices include voice, political stability, voice, political stability, government effectiveness, regulatory quality, rule of law, and corruption. Higher value of Institution indicates better country governance and better institutions
ADRI	Anti-director index (*ADRI*) of La Porta et al. (1998) and Djankov et al. (2008). A higher value of ADRI means better shareholder rights.
Concentration	Measured as the ratio of the asset of the three largest banks divided by the total assets of banking sector.
Log GDP	The log of real gross domestic product (GDP) per capita in dollars for 2006.
Current account	The ratio between the current account deficit and GDP for 2006.

Appendix B. Country Characteristics

Appendix B presents the summary statistics for country characteristics. The sample includes 234 small and medium banks in Bankscope with returns available from Datastream, with a loans-to-assets ratio larger than 10% and a deposits-to-assets ratio larger than 20% as of 2006. Country characteristics are computed using data from 2006. Definitions of all variables are presented in Appendix A.

Country	number of small & medium banks	Log GDP	Current Account	Concentration	ADRI	Institution	Official	Capital	Restrict	Private monitoring	Deposit Insurance
Australia	9	10.50	-5.32	0.62	4	1.60	13	4	10	7	0
India	6	6.63	-1.06	0.33	5	-0.15	10	8	11	6	1
Indonesia	16	3.20	0.30	0.44	2	-0.62	12	8	11	7	1
Japan	133	10.44	3.91	0.39	4.5	1.24	12	6	11	8	1
Malaysia	5	8.69	16.01	0.46	4.5	0.36	13	6	11	7	1
New Zealand	1	4.43	-0.71	0.59	4	1.78	11	8	10	7	0
Pakistan	10	2.94	-0.49	0.45	4.5	-0.97	12	9	11	7	0
Philippines	11	3.14	0.57	0.52	3	-0.34	11	10	11	7	1
Korea	21	9.89	0.57	0.51	4.5	0.63	11	4	9	8	1
Singapore	3	10.36	25.42	0.86	5	1.48	13	7	10	8	0
Thailand	19	3.53	1.10	0.50	2	-0.03	12	8.5	11	7	1
	Total: 234										

Table 1. Summary Statistics

The table presents summary statistics for the variables used in this study. The sample includes 234 small and medium banks in Bankscope with return available from Datastream, with a loans-to-assets ratio larger than 10% and a deposits-to-assets ratio larger than 20% as of 2006. Definitions of all variables are presented in Appendix A. Returns are in percent. Firm characteristics are computed using data from 2006, prior to the beginning of the financial crisis. The regulation variables come from Barth et al. (2008). The variable *Institution* is the simple average of six indicators reported by Kaufmann et al. (2008). Macroeconomic variables are from the World Bank.

Variables	Number Observation	Min	Max	Average	Median	Standard deviation
Stock return						
2006	234	-50.00	50.00	-2.98	-2.58	8.44
July 2007-December 2008	234	-100.00	200.00	-30.88	-34.15	38.76
Bank characteristics						
Tier 1	226	4.99	18.56	8.84	8.13	3.37
Tangible Equity	234	1.21	28.25	10.21	6.75	7.85
Deposit	234	21.65	95.10	79.35	86.80	18.72
Funding Fragility	230	0.20	99.94	24.79	6.22	35.97
Loan	234	11.51	91.29	60.30	64.00	18.02
Liquid Asset	234	0.05	58.65	12.33	7.35	12.91
Other operating assets	232	1.28	69.62	25.14	24.24	15.37
Income Diversity	234	0.01	0.25	0.14	0.07	0.03
Non-Interest	234	3.33	87.52	24.46	15.73	23.45
log Z	190	0.10	4.47	0.63	1.00	0.90
Regulation and institution						
Official	234	10.00	13.00	11.88	12.00	0.55
Capital	234	4.00	10.00	6.47	6.00	1.53
Restrict	234	9.00	11.00	10.76	11.00	0.60
Private monitoring	234	6.00	8.00	7.65	8.00	0.53
Deposit Insurance	234	0.00	1.00	0.90	1.00	0.30
Institution	234	-0.97	1.78	0.75	1.24	0.95
ADRI	234	2.00	5.00	4.09	4.50	0.75
Corporate Governance						
Board	190	5.00	18.00	8.12	6.47	4.26
Macroeconomic variables						
Log GDP	234	2.94	10.50	8.51	10.44	3.05
Current Account	234	-5.32	25.42	2.82	3.91	3.98
Concentration	234	33.00	86.00	43.77	0.39	8.02

Table 2. Summary statistics for banks in the first and fourth quartiles of stock return performance from July 2007 to December 2008

The table compares characteristics of banks in the bottom quartile of stock return performance relative to those in the top quartile of stock return performance. The sample includes 234 small and medium banks in Bankscope with return available from Datastream, with a loans-to-assets ratio larger than 10% and a deposits-to-assets ratio larger than 20% as of 2006. Definitions of all variables are presented in Appendix A. Returns are in percent. Firm characteristics are computed using data from 2006, prior to the beginning of the financial crisis. The regulation variables come from Barth et al. (2008). The variable institution is the simple average of six indicators reported by Kaufmann et al. (2008). Macroeconomic variables are from the World Bank. *,**, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Variables	Mean of banks in the bottom quartiles of the distribution of returns (1)	Mean of banks in the top quartiles of the distribution of returns (2)	Test for equality of means (p-values) (3)
Stock return			
2006	-5.03	-1.40	0.01***
July 2007-December 2008	-58.70	-6.86	0.00***
Bank characteristics			
Tier 1	8.14	9.43	0.02**
Tangible Equity	73.84	81.31	0.01***
Deposit	15.19	44.50	0.01***
Funding Fragility	62.47	50.59	0.02**
Loan	12.29	15.48	0.12
Liquid Asset	22.12	26.05	0.05**
Other operating assets	13.83	10.96	0.14
Income Diversity	0.28	0.21	0.27
Non-Interest	27.89	19.20	0.02**
log Z	11.90	11.95	0.31
Regulation and institution			
Official	6.22	7.03	0.02**
Capital	10.58	10.79	0.45
Restrict	7.81	10.34	0.02**
Private monitoring	9.14	8.10	0.18
Deposit Insurance	1.00	0.68	0.01***
Institution	1.41	1.12	0.27
ADRI	3.42	3.13	0.41
Corporate Governance			
Board	10.34	9.47	0.21
Macroeconomic variables			
Log GDP	6.09	4.76	0.05**
Current Account	0.42	0.48	0.52
Concentration	45.22	33.01	0.05**

Table 3. Return Regressions for July 2007-December 2008

The table presents the regression results for testing the relation between the characteristics of a bank prior to the crisis and its performance during the crisis for the sample of small and medium banks. Dependent variables are bank's buy-and-hold stock returns over the period July 2007-December 2008. The sample includes 234 small and medium banks in Bankscope with return available from Datastream, with a loans-to-assets ratio larger than 10% and a deposits-to-assets ratio larger than 20% as of 2006. Definitions of all control variables are presented in Appendix A. P-values are in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Regressions with country fixed effects

Variables	Return Regression **All small & medium banks**		Return Regression **Exclude Banks in Japan**	
	(1)	(2)	(3)	(4)
Tier 1	0.0899	0.0251	0.0710	0.1386
	(0.03)**	(0.03)**	(0.02)**	(0.02)**
Deposit	1.5977		2.2271	
	(0.01)***		(0.04)**	
Funding Fragility		-0.0847		-0.5795
		(0.01)***		(0.02)**
Loan	-1.0055	-0.9115	-2.8536	-0.7287
	(0.12)	(0.13)	(0.18)	(0.22)
2006 return	-0.9270	-1.0045	-1.2622	-0.8410
	(0.01)***	(0.01)***	(0.04)**	(0.02)**
Log asset	-0.0332	-0.0382	0.0497	0.0411
	(0.27)	(0.24)	(0.73)	(0.83)
Non-Interest	0.6156	0.0097	0.8102	0.6273
	(0.04)**	(0.05)**	(0.05)**	(0.03)**
log Z	0.0567	0.0729	0.0563	0.4282
	(0.12)	(0.06)*	(0.07)*	(0.18)
Board	-0.2587	-0.0690	-0.0341	-0.0269
	(0.13)	(0.15)	(0.25)	(0.16)
Constant	-0.3684	1.2145	-0.0453	6.3591
	(0.62)	(0.01)	(0.69)	(0.23)
Country-fixed effects	Yes	Yes	Yes	Yes
Adjusted R^2	61.45%	57.71%	90.97%	96.23%

Panel B: Regressions with regulation and macroeconomic variables

Variables	Return Regression **All small & medium banks**		Return Regression **Exclude Banks in Japan**	
	(1)	(2)	(3)	(4)
Tier 1	0.1570	0.0633	0.0447	0.0151
	(0.01)***	(0.05)**	(0.01)***	(0.01)***
Deposit	0.9247		1.5504	
	(0.04)**		(0.01)***	
Funding Fragility		-0.2219		-1.2043
		(0.04)**		(0.01)**
Loan	-0.5600	-0.1701	-0.5102	-1.1505
	(0.08)*	(0.05)**	(0.06)*	(0.06)*
2006 return	-0.9078	-0.6641	-1.9485	-1.3103
	(0.02)**	(0.03)**	(0.02)**	(0.04)**

Log asset	-0.0171	-0.0267	-0.0184	-0.0273
	(0.53)	(0.36)	(0.83)	(0.78)
Board	-0.1293	-0.3356	-0.0096	-0.1022
	(0.05)***	(0.03)**	(0.04)**	(0.05)**
Log GDP	-2.3211	-2.4476	0.7522	1.0821
	(0.06)*	(0.10)*	(0.10)	(0.09)
Current Account	-5.1139	-5.2906	-0.3523	-0.4464
	(0.04)**	(0.05)**	(0.06)*	(0.05)**
Official	3.8668	3.9960	2.4515	3.6771
	(0.08)	(0.06)*	(0.14)	(0.13)
Capital	7.9064	8.1349	1.6227	2.0227
	(0.06)*	(0.08)	(0.13)	(0.11)
Restrict	1.8100	1.8577	1.1856	1.6538
	(0.02)**	(0.03)**	(0.02)**	(0.02)**
Private Monitoring	8.162	8.3295	8.6533	12.4953
	(0.07)	(0.06)*	(0.08)	(0.07)
Deposit Insurance	-3.642	-8.6709	-0.1636	-0.4699
	(0.04)**	(0.08)	(0.09)	(0.08)
ADRI	2.320	2.4097		
	(0.04)**	(0.08)		
Constant	-31.378	-46.0570	-15.4583	-11.6505
	(0.04)	(0.08)	(0.21)	(0.16)
Adjusted R^2	*45.97%*	*39.64%*	*44.66%*	*41.92%*

Table 4. Risk Regression

The regressions estimate the relation between a measure of risk over the period of July 2007-December 2008 and bank characteristics. The dependent variable is a bank's distance to default (*Log Z*), measured as the ratio of the return on assets plus the capital-asset ratio divided by the standard deviation of the return on assets. The sample includes 234 small and medium banks in Bankscope with return available from Datastream, with a loans-to-assets ratio larger than 10% and a deposits-to-assets ratio larger than 20% as of 2006. Definitions of all control variables are presented in Appendix A. P-values are in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Variables	Risk measure: Log of distance to default (*Log Z*) All small & medium banks	
	(1)	(2)
Tier 1	0.0318	0.0326
	(0.42)	(0.29)
Deposit	0.8974	0.8744
	(0.59)	(0.42)
Loan	-0.9175	-0.9753
	(0.77)	(0.74)
2006 return	-3.1371	-2.7097
	(0.14)	(0.11)
Log asset	-0.2228	-0.1753
	(0.12)	(0.11)
Other Earning assets	-1.9110	-1.1475
	(0.05)**	(0.07)*
Board	-1.0245	
	(0.08)	
Log GDP		2.1755
		(0.04)**
Current Account		-0.1519
		(0.11)
Official		4.8672
		(0.01)***
Capital		5.9533
		(0.00)***
Restrict		-4.8564
		(0.02)**
Private Monitoring		-3.9276
		(0.07)*
Deposit Insurance		-1.5245
		(0.09)
Constant	0.4217	
	(0.89)	
Country fixed effects	Yes	No
Adjusted R2	*65.32%*	*61.28%*

Table 5. Return Regression- Post crisis performance

Panel A of the table presents regression results for testing the association between the characteristics of a bank prior the crisis and its post-crisis performance. Dependent variable is bank's post-crisis performance, measured by bank's buy-and-hold stock return over the period from January 2009 to December 2014. Control variables are similar to those in Table 3, except 2006 return is replaced with the bank performance during the crisis (2007-2008 return), measured by bank's buy-and-hold stock return over the period from July 2007 to December 2008. Panel B of the table presents regression results for testing the relation between the characteristics of a bank during the crisis and its post-crisis performance. Dependent variable is bank's post-crisis performance, measured by bank's buy-and-hold stock return over the period from January 2009 to December 2014. Firm-level control variables are computed over the period of 2007-2008. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A. Bank characterisitcs prior the crisis and bank's post crisis performance

Variables	Return Regression All small & medium banks		Return Regression Exclude Banks in Japan	
	(1)	(2)	(3)	(4)
Tier 1	0.0526	0.0659	0.4012	0.4896
	(0.11)	(0.11)	(0.29)	(0.38)
Deposit	1.6439		4.3455	
	(0.30)		(0.72)	
Funding Fragility		-0.4204		-1.5006
		(0.69)		(0.59)
Loan	1.4992	1.3398	7.8707	2.4236
	(0.08)*	(0.17)	(0.41)	(0.50)
2007-2008 return	3.0347	2.0872	4.4940	2.6661
	(0.06)*	(0.07)*	(0.08)*	(0.06)*
Log asset	0.0774	0.0362	0.1286	-0.1909
	(0.31)	(0.63)	(0.86)	(0.88)
Non-Interest	-0.1001	-0.1974	1.4014	-6.2417
	(0.59)	(0.64)	(0.80)	(0.82)
log Z	0.0748	0.0416	0.0954	-0.7123
	(0.42)	(0.64)	(0.88)	(0.68)
Board	-0.1267	-0.0875	-0.2218	-0.1352
	(0.21)	(0.13)	(0.19)	(0.34)
Constant	0.6840	-0.1683	-13.7096	-21.7094
	(0.71)	(0.88)	(0.42)	(0.48)
Country fixed effects	Yes	Yes	Yes	Yes
Adjusted R^2	*61.95%*	*65.30%*	*69.43%*	*73.55%*

Panel B. Bank characteristics during the crisis and banks' post crisis performance

Variables	Return Regression All small & medium banks		Return Regression Exclude Banks in Japan	
	(1)	(2)	(3)	(4)
Tier 1	0.0112	0.0473	0.2021	0.2696
	(0.23)	(0.18)	(0.29)	(0.28)

Deposit	0.1329		1.1435	
	(0.34)		(0.33)	
Funding Fragility		-1.2041		-1.0006
		(0.42)		(0.39)
Loan	0.2082	1.0191	2.7627	1.2361
	(0.18)	(0.27)	(0.31)	(0.49)
2007-2008 return	1.4731	0.0712	1.1040	1.1651
	(0.11)	(0.17)	(0.18)	(0.16)
Log asset	1.2347	0.0022	0.06711	-1.009
	(0.21)	(0.13)	(0.27)	(0.56)
Non-Interest	-1.3451	-1.4123	-0.2171	-2.2115
	(0.18)	(0.23)	(0.56)	(0.27)
log Z	0.0085	0.0061	0.1541	0.2718
	(0.13)	(0.47)	(0.28)	(0.34)
Board	-0.0067	-0.0078	-0.0118	-0.053
	(0.34)	(0.23)	(0.26)	(0.24)
Constant	1.6137	-1.8331	-8.9067	-12.4091
	(0.59)	(0.54)	(0.31)	(0.47)
Country fixed effects	Yes	Yes	Yes	Yes
Adjusted R^2	*50.28%*	*55.34%*	*49.16%*	*42.45%*

Online Appendix

"Bank performance during the credit crisis: Evidence from Asia-Pacific countries"

In Online Appendix, we conduct a set of sensitivity analyses. First, we repeat the main regressions using alternative definitions of the crisis period. Second, we use alternative measures of bank performance. Finally, we use three alternative measures of bank governance.

A. Alternative definitions of the crisis period

Erkens et al. (2012) define January 2007 as a starting point of the crisis because this is the period when the market first realized the severity of the losses related to subprime mortgages. The authors define the end of the crisis as in the third quarter of 2008 because the massive government bailouts, such as TARP in the U.S., were initiated from October 2008 onwards. Aebi et al. (2012) suggest other definitions of the crisis period: from mid-2007 to just before the Lehman Brothers bankruptcy in September 2008. Following Erkens et al. (2012) and Aebi et al. (2012), we repeat the main regressions with the bank performance measured over two periods: January 2007-September 2008 and July 2007-September 2008. Results, reported in Panel A of Table A1, are consistent with the previous findings. Specifically, the coefficients on *Tier 1*, *Deposit*, and *Non-Interest* are all positive and statistically at 5% level of significance. Similarly, the coefficients on *Funding Fragility* are statistically negative at 5% level. Overall, these results suggest that small and medium banks with higher Tier 1 capital, more deposit, and less funding fragility performed better during the crisis.

{INSERT TALBE A1 HERE}

B. Alternative measures of bank performance

The first alternative measure of bank performance is the return on equity (*ROE*), defined as the banks' cumulative net income over the years 2007 and 2008, divided by the book value of equity as of year-end 2006. The second measure we use is the return on assets (*ROA*), defined as the banks' cumulative net income over the years 2007 and 2008, divided by total assets as of year-end 2006. Results for regression using these alternative measures of bank performance are presented in Panel B of Table A1. We find our results are robust to alternative measures of bank performance. Specifically, the coefficients on two bank characteristics, including Tier 1 and deposit, are statistically significant. The coefficients on *Non-interest*, however, are not significant at 10% level. In addition, the coefficients on funding fragility are negative and significant, which are consistent with the findings of Table 3.

C. Alternative measures of bank governance

We use three alternative measures of bank governance. First, we use *Board size*, measured as the natural logarithm of the number of directors on a bank's board. Second, we use a dummy

variable whether the CEO is also the chairman of the board of directors (*CEO/Chairman*). Finally, we follow Laeven and Levine (2009) and Erkens et al. (2012) and measure *Large shareholder* as a dummy variable which is equal to 1 if a firm has a large owner with direct or indirect voting rights greater than 10% and 0, otherwise. We report results for regression using these alternative measures of bank governance in Panel C of Table A1. Consistent with the findings of Table 3, the results of Panel C of Table A1 suggest that there is no significant relation between bank governance, measured by Board size, CEO/Chairman dummy or large shareholder dummy, and the performance of small and medium banks.

Table A1: Sensitivity Analysis

Panel A of Table A1 presents regression results using alternative definitions of the crisis period. Dependent variables are bank's buy-and-hold stock returns over the period January 2007-September 2008 (Columns 1 and 2), and bank's buy-and-hold stock returns over the period July 2007- September 2008 (Columns 3 and 4). Other variables are similar to those in Table 3. Panel B of Table A1 presents regression results using two alternative measures of bank performance**.** Dependent variables are return on equity (Columns 1 and 2) and returns on assets (Columns 3 and 4). Panel C of Table A1 presents regression results using three alternative measures of bank governance. Dependent variables are bank's buy-and-hold stock returns over the period July 2007-December 2008. Columns (1), (2), and (3) report results for Board size, CEO/Chairman dummy, and Large shareholder, respectively. The sample includes 234 small and medium banks in Bankscope with return available from Datastream, with a loans-to-assets ratio larger than 10% and a deposits-to-assets ratio larger than 20% as of 2006. P-values are in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Regressions using alternative definitions of the crisis period

	Alternative definitions of the crisis period			
Variable	**January 2007 – September 2008**		**July 2007- September 2008**	
	(1)	(2)	(3)	(4)
Tier 1	0.0018	0.0051	0.0063	0.0086
	(0.04)**	(0.02)**	(0.03)**	(0.04)**
Deposit	0.2371		2.2271	
	(0.02)**		(0.04)**	
Funding Fragility		-0.1082		-0.1295
		(0.02)**		(0.04)**
Loan	-2.1247	-1.2341	-1.7643	-1.7087
	(0.23)	(0.21)	(0.19)	(0.21)
2006 return	-0.6792	-0.8912	-0.2341	-0.2512
	(0.02)**	(0.02)**	(0.04)**	(0.03)**
Log asset	-1.0023	-1.0371	-0.0476	-0.0311
	(0.21)	(0.22)	(0.43)	(0.48)
Non-Interest	0.2382	0.1078	1.0021	1.02371
	(0.05)**	(0.04)**	(0.02)**	(0.02)**
log Z	1.0023	1.0029	0.1489	0.3123
	(0.22)	(0.16)	(0.27)	(0.29)
Board	0.0008	0.0052	0.0046	0.0031
	(0.18)	(0.16)	(0.15)	(0.17)
Constant	1.1472	1.5211	0.8927	1.0021
	(0.09)	(0.11)	(0.07)	(0.13)
Country-fixed effects	Yes	Yes	Yes	Yes
Adjusted R^2	50.95%	47.62%	78.29%	76.46%

Panel B: Regressions using alternative measures of bank performance

	Alternative measures of bank performance			
Variable	**ROE**		**ROA**	
	(1)	(2)	(3)	(4)
Tier 1	0.0019	0.0012	0.0007	0.0018
	(0.05)**	(0.05)**	(0.04)**	(0.04)**
Deposit	0.0026		0.1202	

	(0.02)**		(0.05)**	
Funding Fragility		-0.0008		-0.0015
		(0.04)**		(0.05)**
Loan	-0.0012	-0.0037	0.2185	0.2236
	(0.12)	(0.13)	(0.18)	(0.22)
2006 return	-0.0007	-0.0005	-0.0031	-0.0017
	(0.06)*	(0.07)*	(0.06)*	(0.08)*
Log asset	-0.0003	-0.0008	0.0007	0.0001
	(0.15)	(0.17)	(0.16)	(0.13)
Non-Interest	0.1238	0.1192	0.0221	0.0366
	(0.12)	(0.16)	(0.11)	(0.13)
log Z	-0.1153	-0.8134	0.1168	0.1229
	(0.12)	(0.16)	(0.17)	(0.15)
Board	0.0055	0.0071	0.0023	0.0062
	(0.23)	(0.15)	(0.15)	(0.18)
Constant	1.4123	1.4153	0.6712	1.9121
	(0.22)	(0.71)	(0.29)	(0.21)
Country-fixed effects	Yes	Yes	Yes	Yes
Adjusted R^2	41.23%	37.21%	70.08%	66.89%

Panel C: Regressions using alternative measures of bank governance

Variable	(1)	(2)	(3)
Board size	-0.0071		
	(0.21)		
CEO/Chairman		0.0112	
		(0.15)	
Large shareholder			0.0065
			(0.18)
Tier 1	0.0009	0.0011	0.1286
	(0.06)*	(0.08)*	(0.05)**
Deposit	0.0712	0.0118	0.1276
	(0.07)*	(0.10)*	(0.08)*
Loan	0.0014	0.0105	0.0060
	(0.11)	(0.13)	(0.12)
2006 return	-0.6217	-0.8215	-0.7125
	(0.06)*	(0.07)*	(0.08)*
Log asset	0.0113	-0.0127	0.0670
	(0.21)	(0.34)	(0.23)
Non-Interest	0.0096	0.1107	0.6273
	(0.09)*	(0.15)**	(0.03)**
Constant	-7.1187	4.1125	2.8726
	(0.82)	(0.19)	(0.43)
Country-fixed effects	Yes	Yes	Yes
Adjusted R^2	30.87%	27.81%	36.12%