

Bank Corporate Governance Reforms and Bank Values: An International Study

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ABSTRACT

This paper examines the impact of corporate governance reforms on bank valuation in an international sample. We find that improved corporate governance following the exogenous governance reforms significantly enhances bank valuation. The effect is stronger for banks with lower leverage and banks in less developed stock markets, highlighting the need for tailored governance approaches. The effect is also stronger if the reform requires separation of CEO and chairman, and if the reform is after the draft of Basel II. Our findings emphasize the importance of adapting reforms to local regulatory contexts, drawing insights into recent banking reforms in both developed and emerging markets.

Keywords: Banking, International studies, Corporate Governance, Firm Value

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1. INTRODUCTION

Corporate governance reforms have emerged as pivotal mechanisms for strengthening financial stability and safeguarding stakeholder interests globally. These reforms have garnered significant attention in academic research (Fauver et al., 2017; Singh et al., 2018; Andres and Vallelado, 2008), yielding mixed results. In a related paper, Fauver et al. (2017) focus on the non-bank global sample and find a positive impact of corporate governance. However, whether their conclusions are applicable to banks is an open question because financial companies are normally subject to different regulatory requirement compared to industrial firms². . Given the gap in literature, we aim to address the following questions in this paper: Do board reforms affect banks' value? How does the impact of board reforms on bank valuation differ across various bank-level and country-level characteristics? What role do specific components of these reforms play in shaping their overall impact on firm value? This paper aims to address these questions by examining the global impact of major corporate board reforms on bank valuation.

Previous studies have shown that banks differ significantly from firms in other industries in terms of corporate governance. First, banks lack external creditors to monitor and govern them. For non-bank firms, the presence of large external creditors constrains management, as improper conduct or breaches of debt terms may result in management losing control of the firm (Haan and Vlahu, 2016). In contrast, banks' creditors are numerous and dispersed depositors, and the high level of information asymmetry makes it difficult for them to impose market monitoring on banks through "voting with their feet" like investors in capital markets (Demirgüç and Detragiache, 2002). Also, under deposit insurance protection, depositors have no incentive to monitor banks (Laeven, 2013). Second, shareholders' ability to

²Laeven (2013) and Haan and Vlahu, 2016 suggest that the disperse creditor(depositor) and restriction on the change of ownership limits the market monitoring on banks, which makes banks relying on the regulations from authorities.

govern banks is constrained, as most countries have strict regulations on changes in bank ownership. On the one hand, this limits the concentration of bank ownership and reduces shareholders' incentives to intervene in bank operations (Laeven, 2013; Haan and Vlahu, 2016). On the other hand, this restricts hostile takeovers of banks (Adams and Mehran, 2003). Overall, banks rely more on external regulatory oversight and internal governance and lack market monitoring, which constitutes the biggest difference between bank governance and non-bank corporate governance. Thus, compared to other firms, does board independence still matter? Given the weak market monitoring, is board independence still positively related to bank value? The positive correlation between board independence and firm valuation found by Fauver et al. (2017) in non-bank firms requires further validation. To address these questions, we analyze the impact of bank corporate governance reforms on bank valuation, measured using Tobin's Q.

Board reforms refer to changing of corporates' governing bodies in structure or procedure, to improve accountability, transparency, diversity, or effectiveness. Board reforms aims to enhance corporates' operation compliance, raise stakeholder representativeness, and strengthen risk management. We follow Fauver et al. (2017) and use the staggered adoption of board reform across countries as an exogenous shock to banks.

Our empirical analysis starts from a global bank-year panel data which includes 78 countries from 1991 to 2015 and utilizes staggered difference-in-difference (DID) design with bank and year FEs. Overall, our baseline results show that banks' valuation significantly increased after board reform. The coefficient estimate of our main independent variable (*Post*) on the dependent variable (*TobinQ*) is 0.054 ($t = 3.88$), indicating that after board reform, remaining other things equal, the Tobin's Q of banks increased about 5.4% in average. The magnitude of our result is smaller than the result of Fauver et al., (2017), who find an approximately 15% increase in Tobin's Q for firms (excluding financial and utilities firms)

after board reform over a similar sample period (1990–2012). We attribute this difference to the unique regulation on banks. For example, most authorities restrict the concentration of ownership of banks (Caprio and Levine, 2002; Laeven, 2013), while the board structure dominated by small blockholders may weaken the incentive of shareholder (also the board member) to intervene the operation of banks (Edmans and Manso, 2010). Stricter regulations make the traditional governance mechanisms through board and investors ineffective in banks, thereby attenuating the positive impact of board reform

To strength the causal inference, we conduct two analyses. First, our dynamic analysis confirms that there were no pre-trends in Tobin's Q before board reforms, satisfying the parallel trends assumption. Second, to avoid the biased estimation in staggered DID due to heterogeneous treatment effect (Baker et al., 2022), we perform the stack DID analysis based on the sample matched by propensity score. Specifically, we construct 10 cohorts corresponding to 10 different board reform years in our sample. In each cohort, the control banks are selected based on propensity score method (with caliper=0.0001) from a pool only including the banks that have never received treatment before. Also, we only keep the observations within [-3, +3] years around the event. After that, we stack the cohort together and add the Bank*Cohort FEs and Year*Cohort FEs into the regression. In addition, we also perform the placebo test by assigning 3 years before the event as the pseudo reform year. There is no evidence showing the changes in firm value subsequent to the pseudo reform years.

Next, we explore the moderating role of country-level conditions. The two variables in our consideration are *Stock to GDP* (as the measurement the development of financial market, it's equal to the ratio of total stock trading amount to GDP) and *Developed* (equal to 1 for the developed countries and 0 otherwise) We interact the two variables with the *Post* term. The results show that the effect of board reform is less pronounced in the developed countries and countries with advanced financial market. This can be attributed to the presence of effective

financial regulations. The developed countries generally have stricter and granular regulations on banks. The Sarbanes-Oxley Law and Dodd-Frank Act implemented in the U.S are two good examples. (Danisman and Demirel, 2019) Thus, the regulatory frameworks may substitute for the functions of board reforms.

In our cross-sectional analysis, we examine bank level and country level variations. For the bank level interaction effect, as expected, we find that the banks with higher leverage benefit less from the board reform. Under the capital adequacy-based banking regulatory framework adopted in many countries, highly leveraged banks will naturally be subject to stricter regulation (Laeven, 2013). This strong external regulation has substituted internal governance to some extent, thereby weakening the role of board reform. In addition, we discover that the specific content of board reforms matters. The positive effect of board reform will be pronounced if the reform requires the separation of CEO and board of director or it is implemented after the draft of Basel II. Prior research shows that high-powered incentives contracts will create enormous opportunities for self-dealing for the managers and make the managers' interests more aligned with those of the shareholders, which results in a worse banks' performance (Fahlenbrach and Stulz, 2011). Thus, the separation of CEO and board of director will partly cut the ties between manager and shareholder and enhance the positive effect of board governance reform. For the board reform implemented after the draft of Basel II, we believe that these reforms can draw on Basel II's views on market governance and internal control to achieve better results. Finally, we also conduct additional tests for a deeper understanding of differences among countries. We find that banks in non-North American areas benefit more from board reforms, compared with those banks in North America, where effective regulations such as Sarbanes-Oxley Law have already improved banking industry.

This research significantly advances the fields of banking, corporate governance, and financial stability within the context of evolving international dynamics. It enhances the

theoretical understanding of the relationship between corporate governance reforms and bank valuation through Tobin's Q, establishing a positive correlation between effective governance practices and increased bank valuation.

Our paper makes following contributions. First, we contribute to the discussion of governance and firm valuation in prior literature. Although prior studies such as Caprio et al. (2007) have explored governance and firm value, they do not establish causal inference as we did in this study. Fauver et al. (2007) explore the impact of governance reform on firm value and finds a positive effect. However, Fauver et al. (2007) do not include banks in their sample, (see, (p.124, "we exclude firms in regulated industries (financial firms and utilities")., Our paper complements above papers by providing causal evidence of governance and firm valuation for banking industry.

Our paper also adds to the policy implication regarding the regulatory efforts towards banks. By examining country-level factors such as the advanced degree of financial market and country development status, the study adds nuance to the interaction between these variables and governance reforms, emphasizing the need for tailored approaches that reflect local regulatory environments. For policymakers, the research underscores the importance of implementing governance reforms that address vulnerabilities exposed by recent financial crises, recommending quantitative risk guidelines and accountability measures for bank executives. Overall, this study contributes to the ongoing discourse on international bank governance reform, advocating for adaptive mechanisms that can enhance bank valuation and better withstand future financial challenges.

The remainder of the paper is organized as follows: Section 2 presents the literature review. Section 3 presents the hypothesis development. Section 4 presents empirical design. Section 5 presents empirical results. Section 6 concludes.

2. RELATED LITERATURE

Research on bank governance and valuation underscores their critical role in the global economy and the complexities of regulatory frameworks. This review synthesizes key studies on board structures, bank valuations, ownership structures, and international governance reforms to elucidate the challenges and opportunities in international banking.

The relationship between board structure and firm value is critical (Adams and Mehran, 2012; de Haan and Vlahu, 2016). Singh et al. (2018) find that board size, board committees, and ownership concentration positively impact TQ, while board independence and CEO duality have negative effects. While promoting diversity and inclusion improves decision-making and performance (Adams et al., 2018; Arnaboldi et al., 2021; Balsam et al., 2021; Joo et al., 2021; Lee et al., 2024), it may also negatively affect performance if not well-aligned with the firm's needs (Frijns et al., 2016; Fan, 2024). Strong leadership and clear governance structures enhance committee effectiveness (Asahak et al., 2018). Regulatory compliance and market conditions also influence committee performance (Asahak et al., 2018). Accountability mechanisms drive better outcomes for board committees (Asahak et al., 2018).

Ownership structure is an important mechanism for governing banks. Board member stock ownership aligns management's interests with shareholders, enhancing performance, particularly in regulated banks (Cho and Kim, 2007; Bhagat and Bolton, 2019; Balsam et al., 2021; Bhagat and Hubbard, 2022). Caprio et al. (2007) note that banks are often controlled by families or the state, except in countries with strong shareholder protection laws. Berger et al. (2005) find that state-owned banks perform worse and have higher nonperforming loan ratios than domestically and foreign-owned banks. While concentrated ownership can facilitate decision-making, it may also create entrenchment risks (Shleifer and Vishny, 1997; Fama and Jensen, 1998).

International governance reforms are crucial for financial stability and resilience. Jiang et al. (2024) note that rising interest rates could have led to insolvency for many U.S. banks without regulatory intervention. Tobin's Q is less effective during crises, while bank resolution plans provide better valuations. Zhang and Wang (2019) find that China's 2002 banking reform reduced market concentration by promoting smaller firms. Ben-Nasr et al. (2021) show that board reforms decrease bank debt ratios, enhancing firm value. Fauver et al. (2017) reports that board reforms in 41 countries increase firm value, especially in regions with weaker legal institutions. Anginer et al. (2018) highlight that shareholder-friendly governance increases systemic risks in large banks. Duffie (2018) identifies key G20 regulatory areas for resilience and transparency, noting decreased secondary-market liquidity. Spendzharova et al. (2016) find that banks prefer existing reforms over new EU proposals, with large banks resisting further reforms.

Research on bank valuation highlights several key factors. Guerry and Wallmeier (2017) find that the diversification discount diminished after the financial crisis. Jones et al. (2011) note that opaque assets yield higher profitability but larger valuation discounts, which reversed in 2007. Flannery et al. (2000) emphasize the importance of early regulatory attention to mitigate social costs of bank losses. Elsas et al. (2010) show that revenue diversification enhances profitability and market valuations. Delong and Deyoung (2007) suggest that large bank mergers often fail to create value due to a lack of best practices. Velasco (2022) finds an inverse relationship between regulatory capital and bank diversification. Huber (2018) reports that significant lending reductions by large banks dampen regional economic activity. Zoghلامي (2020) notes that geographic diversification positively impacts banks from emerging markets. Calomiris and Nissim (2012) attribute declines in market-to-book ratios during the financial crisis to deteriorating intangible assets. Avramidis et al. (2018) discuss the inverse U-

shaped relationship between bank size and market-to-book ratio due to increased monitoring costs.

3. INSTITUTIONAL BACKGROUDN AND HYPOTHESIS DEVELOPMENT

Fauver et al. (2017) study the impacts of firm board reforms on firm's value. These board reforms address board independence and separation of CEO-chair roles. Using data for firms across all industries except finance and utilities sectors, among 41 countries from year 1990 to 2012, the authors find that corporate board reforms help increase corporate value. We aim to fill in the gap that this paper does not study the financial industry. Financial corporations, such as banks, normally require stricter risk management than corporations in other industries. Because their operation will heavily determine economic stability, and their failure might lead to severe consequences such as a financial crisis. Following the idea and research settings of Fauver et al. (2017), we intend to test if similar stories also happen in banks. From the 1990s to 2010s, a series of reforms were implemented specifically to bank's board, providing us with abundant samples to study. Appendix C provides the contents of reforms in various countries over the years. Most of the reforms focus on improving board independence and accountability. One major function of a corporate board is to perform governance to mitigate agency problems (Denis and McConnell, 2003). Since enhancing corporate governance can reduce agency problems and consequently increase firm value (Jensen and Meckling, 1976), if banks' boards are reformed into a more efficient structure, the banks' value, or Tobin's Q, will eventually increase.

Hypothesis 1: Board reform increases banks' Tobin's Q

Banks' board reforms increase banks' value by enhancing governance and reducing agency problems. Based on this, we anticipate that if a bank has already formed a mature structure of supervision before the countrywide board reform, the effect of the reform can be

minified. Moreover, if the agency risk only takes a small part of the bank's total risk, the influence of board reform on the bank may also be weaker than average.

Campbell et al. (2008) state that firms with higher leverage are exposed to higher default risk. Therefore, for these high-leverage banks, the agency risk is not their major concern because it will not affect the banks' value severely, and reducing agency risks will not benefit these banks a great deal.

Hypothesis 2: The effect is weaker for banks with higher leverage ratio

Suppose stock trading accounts for a large proportion of a country's total GDP. In that case, the country will reasonably impose supervision of the stock market as well as the financial market to provide a relatively healthy trading environment (Rajan and Zingales, 2003). Banks in this country will be likely to implement stricter governance as required, even before the board reform. Banks in developed countries normally face more complete and strict regulations, so their operation is already well-monitored to a certain extent (Aggarwal et al., 2011). Financial institutions in such countries have already performed well even before the governance reform. The board reform will help less to these banks. Therefore, the positive influence of board reform is hypothesized to be weaker.

Hypothesis 3: The effect is weaker for countries with more developed financial institutions

Separation of role of CEO and chairman helps to set clear boundary between decision management and decision control (Fama and Jensen, 1983). Results from Brickley et al. (1997) suggest that such practice helps constrain the power of top executives and protect the board independence, thus improving internal governance and further reduce agency costs. Based on these prior studies, we hypothesize that separation of role will strengthen the effects of reform on bank valuation.

Hypothesis 4: The effect is stronger for reforms that require CEO-chairman role separation

Basel II was drafted since 1999 and was finalized in 2004. It provides instructions to banking regulations, by introducing a three-pillar structure to enhance banking stability. Minimum risk coverage requires banks to expand their capital reserves to adequately cover risks (eg. operational risk, market risk and credit risk). Regulatory supervision suggests national regulators assess banks' internal risk management. Market discipline requires disclosure for risk exposures and capital adequacy, improving transparency and comparability of banks' operation. Plentiful studies support the idea that Basel II agreement provides considerably constructive suggestions for banking industry discipline. Repullo and Suarez (2004) demonstrates Basel II's role in harmonizing capital adequacy standards, which assists in making more risk-based regulations. Basel II emphasize supervisory review in regulation making (Barth et al., 2004). Additionally, Basel II's three-pillar structure (capital, supervision, disclosure) provides guidance for systemic risk management and reform implementation (VanHoose, 2007). Demirgüç-Kunt and Detragiache (2010) give evidence that Basel II-aligned reforms help improve banking stability. We choose Basel II because although it was finalized in 2004, it has already influenced the banking industry world-widely ever since its draft from 1999. In addition, compared to Basel I that only focuses on banks' capital level and credit risk mitigation, Basel II addresses the importance of banks' corporate governance, which is closely related to our study of board reforms. Therefore, we hypothesize that with instructions from Basel II, countries can be more effective and efficient when drafting and implementing reforms.

Hypothesis 5: The effect is stronger for reforms after the draft of Basel II Agreement

4. RESEARCH DESIGN

4.1 Variable definition

Our dependent variable is *TobinQ*, which is calculated by the market value of assets divided by the book value of assets. The market value is the sum of the book value of assets minus the book value of equity plus the market value of equity and preferred stock.

Our independent variable is *Post*, which is a country-level dummy variable that takes the value of 1 after the country implements board reform and takes the value of 0 otherwise.

Our control variables include bank-level and country-level control variables. The reason for adding macroeconomic control variables is that we want to control the variation in country-level characteristics (such as financial environment, economic state, etc.) that could impact a bank's valuation. The bank-level control variables contain *Leverage*, *ROA*, *lnAsset*, and *Noninterest*. *Leverage* is defined as the ratio of total liabilities to total assets. *ROA* represents the ratio of net income to total assets. *lnAsset* is the total assets of each observation (millions), and it takes logarithms to scale its variance, to represent the size of the bank. *Noninterest* is the noninterest income divided by the sum of noninterest income and interest income, which measures the income diversity of each bank (Minton et al., 2019). The macroeconomic characteristics contain unemployment rate (%) (*Unemployment*), inflation rate (%) (*inflat*), the growth rate of GDP per capita (%) (*GDP Growth*), and the ratio of total stock trading value to total GDP (%) (*Stock to GDP*) (took logarithms). All the macroeconomic variables are extracted directly from the World Bank development indicators database. To avoid the coefficients of some variables being too small, we divided *Noninterest*, *GDP Growth*, *Unemployment*, *lnAsset*, and *Inflat* by 100. Also, all the variables except for dummy variables are winsorized at a 1% (99%) level.

4.2 Data source and sample

The bank-level variables, which include our independent variable (*TobinQ*) and control variable (*lnAsset*, *ROA*, *Noninterest*, *Leverage*), are all extracted from the Compustat-Global database. The macroeconomic control variables (country level variable), which include

Unemployment, Inflat, GDP Growth, and Stock to GDP, come from the World Bank-World Development Indicators database. The board reform time of each country comes from Fauver et al. (2017). Because most of the board reform events took place between 1998 and 2010, we focus on the period of 1991 to 2015 to fully cover the board reform event and to have enough samples before reform to test the parallel trend of observations. Our raw data from the Compustat-Global fundamental annual database has 593,907 observations, which cover the global firms except the firms in the U.S. and Canada. First, after filtering the banks whose SIC is 6020, 6021, 6022, 6029, or whose GICS group is 4010, it remains about 21443 observations. Second, we drop the duplicated observations with the symbol of gvkey and fiscal year (21427 observations remained). Third, we merge the data with stock daily data from Compustat Global database, calculate the bank-level variable and drop the missing value (13596 observations remained). Fourth, we merge the data with macro-economic data from the World Bank website and drop the missing value (10656 observations remained). Finally, we dropped the observations with missing values and singleton observations (10575 observations remained).

4.3 Regression Model

To test the impact of board reform on a bank's valuation, we employ TWFE staggered DID as our model in baseline regression. The model is as follows:

$$TobinQ_{i,j,t} = \beta_0 + \beta_1 Post_{j,t} + \gamma Controls_{i,j,t-1} + \mu_t + \delta_i + \varepsilon_{i,t}, \quad (1)$$

where $TobinQ_{i,j,t}$ is Tobin's Q of bank i registered in country j and in year t . $Post_{j,t}$ takes the value of 1 if country j has implemented the board reform in year t . $Controls_{i,j,t}$ is the control variables vector that includes both bank- and country-level characteristics. μ_t and δ_i is the time and bank fixed effect, respectively. $\varepsilon_{i,t}$ is the unobservable error term.

4.4 Descriptive Statistics

Table 1 Panel A reports summary statistics of variables in baseline regression, including bank-level characteristics and country-level characteristics. The mean value of Tobin's Q

(*TobinQ*) of global banks is 1.046. The mean value of ROA (*ROA*) is 0.007. The average firm size (*lnAsset*) in the sample equals 0.121 million, the average non-interest ratio (*Noninterest*) equals 0.002, and the average leverage (*Leverage*) equals 0.911. Panel B presents detailed banks' board reform information for each country. Some countries are not included in our sample because of their missing values. Most of the excluded countries miss macroeconomic data. For example, macroeconomic data such as GDP are not available for Argentina. It is probably because during a series of crisis, recession, debt overhang, and inflation, Argentina are not capable to report precise data for its economy. In Panel B, Tobin's Q for Brazil is 2.357, which is extremely high. Normally Tobin's Q is higher for more developed economy. Possible explanations for this high Tobin's Q are as follows: currency volatility due to effects of Argentina 2001 debt crisis and uncertainty of election; market overconfidence after \$30 billion IMF rescue loan; understated book value because of high inflation rate.

<Insert Table 1 Here>

Table 2 reports the correlation matrix of the variables. As is shown in the table, TobinQ is positively correlated with *ROA*, *Noninterest*, *Unemployment*, *Inflat*, and *GDP Growth*, and it is negatively correlated with *lnAsset*, *Leverage*, and *Stock to GDP*.

<Insert Table 2 Here>

5. EMPIRICAL RESULTS

5.1 Baseline Regression

Table 3 reports the baseline regression results. Column 1 reports the results with year fixed effects and bank fixed effects but without control variables. Column 2 adds bank-level control variables to the regression. Column 3 reports the full regression of equation 1, with all control variables, including bank-level and country-level. In Column 1, the coefficient of *Post* is significantly positive at 1% level, suggesting that banks' value will increase after the board reform. This significantly positive correlation still holds after adding various control variables,

as in Columns 2 and 3, which supports the prediction in Hypothesis 1. Interpretation for Column 3 is that the board reform is associated with a 0.054 increase in Tobin's Q.

In general, the coefficients of control variables are consistent with those in prior studies (Minton et al., 2018; Chen et al., 2022). Banks of larger size or with a higher leverage ratio tend to have lower Tobin's Q, while for banks with higher non-interest income ratios, their Tobin's Q tends to be higher. It makes sense that banks with higher non-interest income have a diversified income structure so that they can benefit more from the financial market. Banks with higher leverage are riskier and thus are valued less.

The negative coefficient of the size factor, *lnAsset*, is consistent with the study on global banks' valuation by Minton et al., 2018. However, it is contradicted to cases of banks in the United States. This inconsistency between global banks and U.S. banks can be explained by the different formats of banks' mixed operations. During the Great Depression, to protect the interest of depositors from commercial banks investing in other activities, i.e., investment banking, the Congress of the United States enacted the Glass-Steagall Act. This act prohibited the mixed operation of a bank and strictly separated the commercial activities and the investment activities. Large banks at that time split their operation to stay in line with the Act. For instance, JP Morgan Bank set up Morgan Stanley, a new investment bank subsidiary, and then controlled these two banks at the same time. Although this restriction was lifted in 1999, this format of Bank Holding Company remains a normality for many banks in the United States. In this way, any risks faced by investment banks will not affect the operation of commercial banks. The complexity of operation will not be a threat to the banks' valuation but will instead benefit it. On the other hand, for other global banks, especially banks in Europe, there are no restrictions on banks' mixed operations. Risks from other operations can easily bring up risks for the banks, taking the 2023 Banking Crisis as an example. The larger the size is, the larger

the risk from mixed operations. Therefore, for global banks, the impact of size can be the opposite.

Furthermore, the positive coefficients for the unemployment rate (*Unemployment*) and Stock-to-GDP ratio (*Stock to GDP*) can also be reasonably explained. Banks, which provide secure income, are valued more in a bad economic state, which is opposite to the conditions of other financial institutions. An increase in the unemployment rate indicates a bad economic state, so the banks' value increases and Tobin's Q increases. If the stock-to-GDP ratio is high for a country, the stock trading value takes up a large percentage of its total GDP, which indicates that the stock market is relatively developed in this country. The risk of the financial market is lower, so the valuation of banks is higher, and Tobin's Q is higher.

<Insert Table 3 Here>

5.2 Parallel Trend Test

To clarify the causal relationship between the board reform and change in Tobin's Q, we run a parallel trend test up to two years before the reform. Like the baseline analysis, we run regression in three steps: without control variables, with bank-level control variables only, and with all control variables. The coefficients for *Post(-1)* are all statistically insignificant, suggesting that trends before the event do not significantly differ between treated and control groups, while the coefficients for the event, *Post(0)*, are significant. Together, they indicate that the parallel trend test is passed.

<Insert Table 4 Here>

5.3 Matching Sample Regression

We conduct the propensity score matching in the stack DID in this section. We find one control firm from each treatment firm using a propensity score method (PSM) with cailiper(0.0001). Control firms are selected from a pool of firms from other countries that have not been treated before. The matching variables include firm-level variables (*lnAsset*, *ROA*,

Noninterest, and *Leverage*) and the country-level variables (*Inflat*, *Stock to GDP*, and *GDP growth*). We choose the firm with the closest propensity score to the treatment as the control firm. Treatment firms are classified into 10 cohorts based on their board reform years. For treatment and control firms in each cohort, we keep observations in [-3, +3] years relative to the board reform years (i.e. year 0). *Treat* equals one for treatment firms and zero otherwise. *Post* equals one for observations after the board reform in each cohort and zero otherwise. Most of the t-values of the covariates are insignificant after matching, suggesting that there are no significant differences in covariates between treatment and control groups.

Then, we stack each cohort data together and run the regression same to our baseline regression with the fixed effects of Year FEs*Cohort FEs and Bank FEs*Cohort FEs. The *Post* and *Treat* term is absorbed by the fixed effects. The regression results on these matching samples are basically consistent with the baseline results. Baseline regression results are further supported.

<Insert Table 5 Here>

5.4 Interaction Effect Analysis

To solve our concern that the maturity of a bank's operation might influence the effect of board reform to a certain degree, we adopt 5 proxies for bank maturity and interact with the *Post* variable for the moderating effect analysis.

For the first interaction, *Post*Leverage*, the coefficients are significantly negative, indicating that banks with higher leverage benefit less from the board reform. Banks with higher leverage normally face more risk from the market. The fundamental risk takes up a large part of the banks' total risk, making agency risk only a small percentage of risk. Therefore, for these kinds of banks, by reducing agency risk, board reform contributes less to risk reduction and value increase. Hypothesis 2 is supported.

For the second interaction, *Post*Stock to GDP*, the coefficients are also significantly negative, meaning that for countries where stock trading volume is large, their banks benefit less from board reform. For a country with a high stock trading volume, the stock market and the financial market tend to be better monitored and restricted. Under this circumstance, the governance of the bank board can be stricter, and the agency problem can be better controlled. Since the board reform has a similar aim of reducing agency problems for bank boards, it can be considered as a substitution policy to the country's existing restrictions and, thus, can be less effective.

For the third interaction, *Post*Developed*, the coefficients are also significantly negative. The interpretation is that banks in developed countries benefit less from board reform, while banks in developing countries benefit more from board reform. This is because developed countries follow stricter regulations and corresponding supervision to maintain a healthy economy. Consistent with view of Byers et al. (2008) that regulations are substitutes to banks' corporate governance, Banks that are already in good operation have less to improve. Consequently, board reform provides less improvement for the boards of these banks. Results from the second and third interaction support Hypothesis 3.

For the fourth interaction is *Post* CEO-Duality*. *CEO-Duality* takes value of 1 if the board reform requires the separation of chairman and CEO and takes value of 0 otherwise. The positive coefficient indicates that the positive effect of board reform on banks' valuation will be pronounced if the reform the separation of chairman and CEO. This can be explained that the separation can scale the power of top executives and make CEO to be better monitored by the board. The increasing of internal governance contributes to the increasing of banks' value. This result is different from the viewpoint of Fauver et al. (2017). They find that the effect of separation between chairman and CEO on firms' value is insignificant.

We suppose that the difference is aroused from the features of different industries. For the non-finance firms, which is consisted to the sample used by Fauver et al. (2017), garbing growth opportunities swiftly is at least as important as lowering firms' risk. The separation of chairman and CEO also arouse the agency problem and inefficient decision, thus offset the positive effect of better internal control. While for banks, the investors and authorities pay more attention to their risk. The promotion of internal control can prevent banks from overtaking risks. The results are consistent with Hypothesis 4.

The last interaction is *Post* Basel*. *Basel* takes value of 1 if the board reform took place after the draft of Basel II (in 1999) and takes value of 0 otherwise. The positive coefficient implies that the board reforms implemented after the draft of Basel II are more conducive to the increasing of banks' valuation. This can be explained that Basel II first emphasized the importance of market discipline in monitoring banks' risk³. Also, Basel II proposed many measurements related to enhancing market discipline, such as increasing transparency of banks' operating. Thus, the board reforms that took place after 1999 can be educated and inspired by the framework of Base II, and have greater contribution to the improvement of internal control in enterprises, consistent with Hypothesis 5.

<Insert Table 6 Here>

5.5 Comparison analysis of the effect of board reform

In this part, we compare the effect of board reform in North America (including the US and Canada) and in Non-North America countries. We compare the two sets of countries, considering the fact that the financial system in North America is more advanced, complicated

³ The website about Basel II is <https://www.bis.org/bcbs/history.htm>

and mature, the effect of board reform may be different in financial systems with different levels of maturity.

In Table 7, the interaction term is $Post*NonNA$. $NonNA$ is equal to 1 for the countries besides the US and Canada and is equal to 0 otherwise. The positive coefficient of the interaction term indicates that the board reforms implemented in non-North America countries are more conducive to the increasing of firms' value. This can be resulted from the substitution effect between board reform and other reforms or policy in the field of corporate finance. For reforms such as those under the guidance of Basel II, the positive effects of board reform come from the promotion of firms' internal control, risk management and investor protection, so that banks' stability is improved and capital adequacy is maintained (Repullo and Suarez, 2004; VanHoose, 2007; Demirgüç-Kunt and Detragiache, 2010). While for the US, they had implemented plentiful related policies (Sarbanes-Oxley act etc.) before their board reform and built up a mature institution. The positive effect of board reform is substituted by other policies. For other countries, especially the countries in developing financial systems, the substitution effect between board reform and other policies is lower. Thus, their board reforms have stronger effects.

<Insert Table 7 Here>

5.6 Robustness Test

We adopt three methods in our robustness test.

First, in panel A of Table 8, we add two new fixed effects apart from the existing Year FE and Bank FE. From the additional staggered Difference-in-differences test, we notice that the effect of board reform is more significant in some years than in the other. For instance, the result is more significant for reforms in the years 2003 and 2004. This is probably because of the amendment of the Basel Accords in 2003. Reforms in the years 2003 and 2004 can refer to

more on the Basel Accords and can be more effective under the guidance of the Accords. Under this consideration, we introduce the Event year FEs. After adding these new fixed effects, the regression results are still consistent with the baseline regression results.

Second, in panel B and C of Table 8, we use alternative samples to verify our result in baseline regression. In panel B of Table 8, the sample only includes the observations within $[-5, +5]$ around the board reform, which means that the observations in never treated countries and more than 5 years before/after the board reform will be deleted. This setting allows us to only use the pre-treated sample as control group, which increased comparability between control and treated groups. In panel C of Table 8, the North America sample is included. After using the two alternative samples, the coefficient of *Post* is still significantly positive.

Third, in Table 9, we adopt placebo test of our main result. Specifically, we assign the 3 years before the board reform as the placebo reform year. *PlaceboPost* takes value of 1 after the placebo reform year and takes value of 0 otherwise. The insignificant coefficient in three columns implies that the increasing of banks' valuation is resulted by board reform rather than other events or trend.

<Insert Table 8 Here>

<Insert Table 9 Here>

6. CONCLUSION

In summary, our findings underscore the urgent need for tailored governance reforms within the banking sector. The evolving landscape of bank governance in Europe and the U.S., alongside advancements in valuation techniques, plays a pivotal role in addressing persistent performance disparities. As financial institutions navigate these changes, their capacity to implement effective governance structures and resolution plans will be crucial for sustaining performance and ensuring long-term viability. These insights highlight the necessity for adaptive governance frameworks that not only respond to local economic realities but also

anticipate global challenges. By prioritizing these reforms, banks can better mitigate risks, enhance resilience, and ultimately contribute to a more stable financial system.

This study acknowledges several limitations, including data constraints that may not fully capture the nuances of governance practices across diverse regions, potentially affecting the generalizability of the findings. The temporal scope is another limitation, as the analysis focuses on specific time frames, particularly post-2008 reforms, which may not account for shifts in dynamics due to future financial crises. Additionally, the reliance on Tobin's Q as a primary indicator of bank valuation, while widely accepted, may overlook other aspects of performance. Lastly, the emphasis on developed markets like Europe and the U.S. may exclude valuable insights from emerging markets that face distinct governance challenges.

To build on this study, future research should consider expanding the analysis to include emerging markets, providing a comprehensive understanding of governance reforms across different economic contexts. Longitudinal studies that track the impact of governance reforms over extended periods could assess their long-term effectiveness. Exploring alternative valuation metrics beyond Tobin's Q, such as return on equity or market capitalization (Anginer et al., 2016), would yield a broader perspective on bank valuation. Additionally, investigating the influence of technological advancements in fintech and AI on governance structures could provide critical insights into the future of banking. Finally, evaluating the effectiveness of specific regulatory changes on governance practices would enhance understanding of how policies can be optimized to foster more resilient banking systems.

References:

- Adams, J. C., Nishikawa, T., and Rao, R. P., 2018. Mutual fund performance, management teams, and boards. *Journal of Banking & Finance*, 92, 358–368.
- Adams, R.B., and Mehran, H., 2003. Is corporate governance different for bank holding companies? *Federal Reserve Bank of New York Economic Policy Review*, 9(1): 123–142.
- Adams, R. B., and Mehran, H., 2012. Bank board structure and performance: Evidence for large bank holding companies. *Journal of Financial Intermediation*, 21(2), 243–267.
- Aggarwal, R., Erel, I., Ferreira, M., and Matos, P., 2011. Does governance travel around the world? Evidence from institutional investors. *Journal of Financial Economics*, 100(1), 154–181.
- Andres, P. de, and Vallelado, E., 2008. Corporate governance in banking: The role of the board of directors. *Journal of Banking & Finance*, 32(12), 2570–2580.
- Anginer, D., Demircug-Kunt, A., Huizinga, H., and Ma, K., 2016. Corporate governance and bank capitalization strategies. *Journal of Financial Intermediation*, 26, 1–27.
- Anginer, D., Demircug-Kunt, A., Huizinga, H., and Ma, K., 2018. Corporate governance of banks and financial stability. *Journal of Financial Economics*, 130(2), 327–346.
- Arnaboldi, F., Casu, B., Gallo, A., Kalotychou, E., and Sarkisyan, A., 2021. Gender diversity and bank misconduct. *Journal of Corporate Finance*, 71, 101834.
- Asahak, S., Albrecht, S. L., De Sanctis, M., and Barnett, N. S., 2018. Boards of Directors: Assessing Their Functioning and Validation of a Multi-Dimensional Measure. *Frontiers in Psychology*, 9.
- Avgouleas, E., Goodhart, C., and Schoenmaker, D., 2010. Living Wills as a Catalyst for Action. *Working Papers*, Article 10–09.
- Avgouleas, E., Goodhart, C., and Schoenmaker, D., 2013. Bank Resolution Plans as a catalyst for global financial reform. *Journal of Financial Stability*, 9(2), 210–218.

- Avramidis, P., Cabolis, C., and Serfes, K., 2018. Bank size and market value: The role of direct monitoring and delegation costs. *Journal of Banking & Finance*, 93, 127–138.
- Baker, A.C., Larcker, D.F., and Wang, C.C.Y., 2022. How Much Should We Trust Staggered Difference-in-differences Estimates? *Journal of Financial Economics*, 144(2): 370-395.
- Balsam, S., Puthenpurackal, J., and Upadhyay, A., 2021. Corporate opacity and effectiveness of independent female directors. *Journal of Corporate Finance*, 69(C).
- Barth, J. R., Caprio, G., and Levine, R., 2004. Bank regulation and supervision: What works best? *Journal of Financial Intermediation*, 13(2), 205–248.
- Ben-Nasr, H., Boubaker, S., and Sassi, S., 2021. Board reforms and debt choice. *Journal of Corporate Finance*, 69(C).
- Berger, A. N., Clarke, G. R. G., Cull, R., Klapper, L., and Udell, G. F., 2005. Corporate governance and bank performance: A joint analysis of the static, selection, and dynamic effects of domestic, foreign, and state ownership. *Journal of Banking & Finance*, 29(8), 2179–2221.
- Bhagat, S., and Bolton, B., 2019. Corporate governance and firm performance: The sequel. *Journal of Corporate Finance*, 58, 142–168.
- Bhagat, S., and Hubbard, G., 2022. Rule of law and purpose of the corporation. *Corporate Governance: An International Review*, 30(1), 10–26.
- Brickley, J. A., Coles, J. L., and Jarrell, G., 1997. Leadership structure: Separating the CEO and chairman of the board. *Journal of Corporate Finance*, 3(3), 189–220.
- Byers, S. S., Fields, L. P., and Fraser, D. R., 2008. Are corporate governance and bank monitoring substitutes: Evidence from the perceived value of bank loans. *Journal of Corporate Finance*, 14(4), 475–483.
- Calomiris, C. W., and Nissim, D., 2012. *Crisis-Related Shifts in the Market Valuation of Banking Activities* (w17868). National Bureau of Economic Research.

- Campbell, J. Y., Hilscher, J., and Szilagyi, J., 2008. In Search of Distress Risk. *The Journal of Finance*, 63(6), 2899–2939.
- Caprio, G., Laeven, L., and Levine, R., 2007. Governance and bank valuation. *Journal of Financial Intermediation*, 16(4), 584–617.
- Caprio, G., and Levine, R., 2002. Corporate Governance In Finance: Concepts and International Observations. *Financial Sector Governance: the Roles of the Public and Private Sectors*, 17-50.
- Cho, D.-S., and Kim, J., 2007. Outside Directors, Ownership Structure and Firm Profitability in Korea. *Corporate Governance: An International Review*, 15(2), 239–250.
- Danisman., G.O., and Demirel., P., 2019. Bank Risk-taking in Developed Countries: the Influence of Market Power and Bank Regulations. *Journal of International Financial Markets, Institutions and Money*, 59:202-217.
- de Haan, J., and Vlahu, R., 2016. Corporate Governance of Banks: A Survey. *Journal of Economic Surveys*, 30(2), 228–277.
- Delong, G., and Deyoung, R., 2007. Learning by Observing: Information Spillovers in the Execution and Valuation of Commercial Bank MandAs. *The Journal of Finance*, 62(1), 181–216.
- Demirgüç-Kunt, A., and Detragiache, E., 2002. Does deposit insurance increase banking system stability? An empirical investigation. *Journal of Monetary Economics*, 49(7): 1373–1406.
- Demirgüç-Kunt, A., and Detragiache, E., 2010. Basel Core Principles and bank soundness: Does compliance matter? *Journal of Financial Stability*, 6(4), 179–190.
- Denis, D. K., and McConnell, J. J., 2003. *International Corporate Governance* (SSRN Scholarly Paper 320121). Social Science Research Network.

- Drobetz, W., von Meyerinck, F., Oesch, D., and Schmid, M., 2018. Industry expert directors. *Journal of Banking & Finance*, 92, 195–215.
- Duffie, D., 2018. Financial Regulatory Reform After the Crisis: An Assessment. *Management Science*, 64(10), 4835–4857.
- Edmans, A., and Manso, G., 2011. Governance through Trading and Intervention: a Theory of Multiple Blockholders. *The Review of Financial Studies*, 24(7): 2395-2428.
- Elsas, R., Hackethal, A., and Holzhäuser, M., 2010. The anatomy of bank diversification. *Journal of Banking & Finance*, 34(6), 1274–1287.
- Fahlenbrach, R., and Stulz, R.M., 2011. Bank CEO Incentives and the Credit Crisis. *Journal of Financial Economics*, 99(1):11-26.
- Fama, E. F., and Jensen, M. C., 1983. *Separation of ownership and control*. *Journal of Law and Economics*, 26(2), 301–325.
- Fan, Y., 2024. Board diversity of industry expertise: Impacts on strategic change and product markets. *Review of Quantitative Finance and Accounting*, 62(2), 421–447.
- Fauver, L., Hung, M., Li, X., and Taboada, A. G., 2017. Board reforms and firm value: Worldwide evidence. *Journal of Financial Economics*, 125(1), 120–142.
- Flannery, Berger, A. N., and Davies, S. M., 2000. *Comparing Market and Supervisory Assessments of Bank Performance: Who Knows What When?* ResearchGate.
- Frijns, B., Dodd, O., and Cimerova, H. 2016., *The Impact of Cultural Diversity in Corporate Boards on Firm Performance* (SSRN Scholarly Paper 2817642). Social Science Research Network.
- Guerry, N., and Wallmeier, M., 2017. Valuation of diversified banks: New evidence. *Journal of Banking & Finance*, 80, 203–214. <https://doi.org/10.1016/j.jbankfin.2017.04.004>
- Haan, J., and Vlahu, R., 2016. Corporate governance of banks: a survey. *Journal of Economic Surveys*, 30: 228-277.

- Huber, K., 2018. Disentangling the Effects of a Banking Crisis: Evidence from German Firms and Counties. *American Economic Review*, 108(3), 868–898.
- Jensen, M. C., and Meckling, W. H., 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305–360.
- Jiang, E. X., Matvos, G., Piskorski, T., and Seru, A., 2024. Monetary tightening and U.S. bank fragility in 2023: Mark-to-market losses and uninsured depositor runs? *Journal of Financial Economics*, 159, 103899.
- Johnson, R. B., and Onwuegbuzie, A. J., 2004. Mixed Methods Research: A Research Paradigm Whose Time Has Come. *Educational Researcher*, 33(7), 14–26.
- Jones, J. S., Miller, S. A., and Yeager, T. J., 2011. Charter value, Tobin's Q and bank risk during the subprime financial crisis. *Journal of Economics and Business*, 63(5), 372–391.
- Joo, M. H., Lawrence, E., and Parhizgari, A., 2021. Securities litigation risk and board gender diversity. *Journal of Corporate Finance*, 71, 102102.
- Laeven, L., 2013. Corporate Governance: What's Special about Banks? *Annual Review of Financial Economics*, 5: 63-92.
- Lee, C.-Y., Wen, C.-R., and Thi-Thanh-Nguyen, B., 2024. Board Expertise Background and Firm Performance. *International Journal of Financial Studies*, 12(1), Article 1.
- Minton, B. A., Stulz, R. M., and Taboada, A. G., 2019. Are the Largest Banks Valued More Highly? *The Review of Financial Studies*, 32(12), 4604–4652.
- Rajan, R. G., and Zingales, L., 2003. The great reversals: The politics of financial development in the 20th century. *Journal of Financial Economics*, 69(1), 5–50.
- Repullo, R., and Suarez, J., 2004. Loan pricing under Basel capital requirements. *Journal of Financial Intermediation*, 13(4), 496–521.
- Shleifer, A., and Vishny, R. W., 1997. A Survey of Corporate Governance. *The Journal of Finance*, 52(2), 737–783.

- Singh, S., Tabassum, N., Darwish, T. K., and Batsakis, G., 2018. Corporate Governance and Tobin's Q as a Measure of Organizational Performance. *British Journal of Management*, 29(1), 171–190.
- Spendzharova, A., Versluis, E., Radulova, E., and Flöthe, L., 2016. Too much, too fast? The sources of banks' opposition to European banking structural reforms. *Journal of Banking Regulation*, 17(1), 133–145.
- VanHoose, D., 2007. Theories of bank behavior under capital regulation. *Journal of Banking & Finance*, 31(12), 3680–3697.
- Velasco, P., 2022. Is bank diversification a linking channel between regulatory capital and bank value? *The British Accounting Review*, 54(4), 101070.
- Zhang, J., and Wang, Q., 2019. The Role of Chinese Financial Industry in Promoting Reform and Opening up and Serving the Real Economy in the New Era. *World Review of Political Economy*, 10, 342–359.
- Zoghلامي, F., 2020. Geographical Diversification Effects on Banks' Performance: Evidence from Islamic Banks of some Selected Countries. *Journal of Accounting, Business and Management (JABM)*, 27(2), Article 2.

Table 1 Summary statistics

This table presents descriptive statistics for bank-level and country-level characteristics. Panel A illustrates the summary statistics of our main variables. Panel B presents the Board Reform time (column 3) and the average Tobin's Q of banks (column 2) for each country respectively. The variable definition is illustrated in Appendix A. We winsorize all variables at top and bottom one percentile.

Panel A: Summary statistics

<i>VARIABLES</i>	(1) N	(2) Mean	(3) S.D	(4) Min	(5) Max	(6) P25	(7) P50	(8) P75
Bank's Characteristics								
<i>TobinQ</i>	10575	1.046	0.574	0.815	25.53	0.977	1.002	1.048
<i>lnAsset</i>	10575	0.121	0.033	0.045	0.235	0.097	0.118	0.145
<i>ROA</i>	10575	0.007	0.019	-0.577	0.078	0.002	0.007	0.012
<i>Noninterest</i>	10575	0.002	0.002	-0.008	0.01	0.001	0.002	0.003
<i>Leverage</i>	10575	0.911	0.062	0.407	1.394	0.893	0.927	0.947
Country's Characteristics								
<i>Unemployment</i>	10575	0.069	0.044	0.002	0.299	0.04	0.053	0.092
<i>Inflat</i>	10575	0.037	0.057	-0.049	0.857	0.012	0.025	0.048
<i>GDP Growth</i>	10575	0.021	0.031	-0.145	0.143	0.004	0.02	0.04
<i>Stock to GDP</i>	10575	0.033	0.013	0	0.069	0.025	0.036	0.042

Panel B: Statistics by country

Country	<i>TobinQ</i>	Reform
Australia	1.048	2004
Austria	0.994	2004
Belgium	0.992	2005
Brazil	2.357	2002
Chile	1.075	2001
China	1.021	2001
Colombia	1.033	2001
Czech	1.048	2001
Denmark	1.009	2001
Egypt	1.043	2002
Finland	1.026	2004
France	0.954	2003
Germany	1.013	2002
Greece	1.05	2002
Hong Kong	1.045	2005
Hungary	1.025	2003
India	1.015	2002
Indonesia	1.087	2007
Israel	1.009	2000
Italy	1.036	2006
Japan	0.994	2002
Korea	0.985	1999
Malaysia	1.031	2001
Mexico	1.102	2001
Netherlands	1.01	2004

Norway	0.96	2005
Pakistan	1.012	2002
Peru	1.085	2005
Philippines	1.061	2002
Poland	1.079	2002
Portugal	1.029	2001
Singapore	1.032	2003
Spain	1.034	2006
Sweden	0.976	2006
Switzerland	1.003	2002
Thailand	1.029	2002
Turkey	1.014	2002
United Kingdom	1.066	1998

Table 2. Correlation matrix

This table presents correlation matrix for bank level and country level characteristics. The variable definition is illustrated in Appendix A.

	<i>TobinQ</i>	<i>lnAsset</i>	<i>ROA</i>	<i>Leverage</i>	<i>Noninterest</i>	<i>Inflat</i>	<i>Unemployment</i>	<i>GDP Growth</i>
<i>lnAsset</i>	-0.049	1						
<i>ROA</i>	0.047	-0.11	1					
<i>Leverage</i>	-0.079	0.339	-0.452	1				
<i>Noninterest</i>	0.03	-0.004	0.132	-0.116	1			
<i>Inflat</i>	0.03	0.121	-0.076	-0.135	-0.117	1		
<i>Unemployment</i>	0.034	-0.193	0.033	-0.106	0.018	0.039	1	
<i>GDP Growth</i>	0.038	0.069	0.259	-0.083	-0.038	0.063	-0.091	1
<i>Stock to GDP</i>	-0.021	0.143	-0.03	0.181	0.108	-0.222	-0.214	-0.043

Table 3. Baseline regression

This table presents the results of the impact of the governance reform on firm valuation. The variable definitions are provided in Appendix A. All control variables are lagged by one year. Standard errors, clustered at the bank level and robust to heteroscedasticity, are reported in parentheses. The indicators *, **, and *** represent significance levels of 10%, 5%, and 1%, respectively.

<i>Dep. Var. =</i>	(1)	(2)	(3)
		<i>TobinQ(t+1)</i>	
<i>Post</i>	0.057*** (0.01)	0.059*** (0.01)	0.054*** (0.01)
<i>lnAsset</i>		-0.402* (0.21)	-0.683** (0.31)
<i>ROA</i>		-0.764 (0.53)	-0.758 (0.57)
<i>Leverage</i>		-0.934** (0.47)	-0.929** (0.47)
<i>Noninterest</i>		-0.938 (3.36)	-1.089 (3.36)
<i>Inflat</i>			0.209** (0.10)
<i>Unemployment</i>			0.583*** (0.18)
<i>GDP Growth</i>			0.495** (0.21)
<i>Stock to GDP</i>			-0.697 (0.86)
<i>Constant</i>	1.013*** (0.01)	1.919*** (0.43)	1.915*** (0.45)
Observations	10,575	10,575	10,575
R-squared	0.264	0.266	0.266
Year FEs	Yes	Yes	Yes
Bank FEs	Yes	Yes	Yes

Table 4. Dynamic effect around the board reform events - Parallel trend analysis

This table presents the dynamic impact of the reform on the firm valuation. $Post(i)(-i)$ takes value of 1 if the observation is in i year after (or before) the implementation of board reform and 0 otherwise. The variable definitions are provided in Appendix A. All control variables are lagged by one year. Standard errors, clustered at the bank level, are reported in parentheses. The indicators *, **, and *** represent significance levels of 10%, 5%, and 1%, respectively.

<i>Dep. Var. =</i>	(1)	(2)	(3)
		<i>TobinQ(t+1)</i>	
<i>Post(-1)</i>	-0.004 (0.01)	-0.008 (0.01)	-0.012 (0.01)
<i>Post(0)</i>	0.054** (0.02)	0.052** (0.02)	0.047** (0.02)
<i>Post(1)</i>	0.050*** (0.02)	0.052*** (0.02)	0.044** (0.02)
<i>Post(2)</i>	0.042** (0.02)	0.042** (0.02)	0.036* (0.02)
<i>Post(3+)</i>	0.075** (0.03)	0.078** (0.03)	0.071** (0.03)
<i>lnAsset</i>		-0.400* (0.21)	-0.692** (0.32)
<i>ROA</i>		-0.772 (0.54)	-0.760 (0.57)
<i>Leverage</i>		-0.942** (0.47)	-0.936** (0.48)
<i>Noninterest</i>		-0.883 (3.39)	-1.044 (3.39)
<i>Inflat</i>			0.217** (0.10)
<i>Unemployment</i>			0.575*** (0.17)
<i>GDP growth</i>			0.491** (0.20)
<i>Stock to GDP</i>			-0.723 (0.87)
<i>Constant</i>	1.005*** (0.01)	1.918*** (0.43)	1.917*** (0.45)
Observations	10,575	10,575	10,575
R-squared	0.264	0.266	0.266
Year FEs	Yes	Yes	Yes
Bank FEs	Yes	Yes	Yes

Table 5. PSM matching

This table presents the difference-in-differences (DID) results based on a matched sample. We conduct the propensity score matching and find a control firm for each treatment firm (with caliper=0.0001). We find one control firm from each treatment firm using a propensity score method (PSM). Control firms are selected from a pool of firms from other countries that have not been treated before. The matching variables include firm-level variables (*lnAsset*, *ROA*, *Noninterest*, and *Leverage*) and the country-level variables (*Inflat*, *Stockto GDP*, and *GDP growth*). We choose the firm with the closest propensity score to the treatment as the control firm. Treatment firms are classified into 10 cohorts based on their board reform years. For treatment and control firms in each cohort, we keep observations in [-3, +3] years relative to the board reform years (i.e. year 0). *Treat* equals one for treatment firms and zero otherwise. *Post* equals one for observations after the board reform in each cohort and zero otherwise. Panel A reports the mean statistics of treatment and control firms after matching. Panel B shows the regression result based on the matched sample. The *Treat* and *Post* term are absorbed by the fixed effect.

Panel A Balancing test

<i>Variable</i>	Mean		Diff. (Treated-Control)	t-value
	Treated	Control		
<i>lnAsset</i>	0.115	0.115	0.001	0.47
<i>ROA</i>	0.005	0.002	0.003	1.3
<i>Noninterest</i>	0.002	0.002	0	-0.28
<i>Leverage</i>	0.919	0.919	0	0.08
<i>Stock to GDP</i>	0.033	0.034	-0.001	-1.17
<i>GDP growth</i>	0.019	0.02	-0.001	-0.79
<i>Inflat</i>	0.033	0.04	-0.007	-1.8

Panel B Matched sample regression

<i>Dep. Var. =</i>	(1)	(2)
	TobinQ(t+1)	
<i>Treat*Post</i>	0.044* (0.03)	0.044* (0.03)
<i>Controls</i>	No	Yes
Observations	14,768	14,768
R-squared	0.688	0.692
Year*Cohort FEs	Yes	Yes
Bank*Cohort FEs	Yes	Yes

Table 6. Interaction effect

This table presents the interaction effect of bank, board reform or country level factors. *CEO-Duality* takes value of 1 if the board reform requires the separation of the chairman and CEO positions (Fauver et al., 2017). *Basel* takes value of 1 if the board reform was implemented after the new Basel agreement and takes value of 0 otherwise. The variable definitions are provided in Appendix A. All control variables are lagged by one year. Standard errors clustered at the bank level are reported in parentheses.

<i>Dep. Var. =</i>	(1)	(2)	(3)	(4)	(5)
	<i>TobinQ(t+1)</i>				
<i>Post*Leverage</i>	-0.773* (0.42)				
<i>Post*Stock to GDP</i>		-4.842*** (0.68)			
<i>Post*Developed</i>			-0.088*** (0.02)		
<i>Post*CEO-Duality</i>				0.033** (0.01)	
<i>Post*Basel</i>					0.017* (0.01)
<i>Post</i>	0.764** (0.39)	0.228*** (0.04)	0.121*** (0.03)	0.069*** (0.02)	0.038*** (0.01)
<i>Leverage</i>	-0.503* (0.30)	-0.920* (0.47)	-0.927** (0.47)	-1.150* (0.61)	-0.929** (0.47)
<i>lnAsset</i>	-0.673** (0.31)	-0.667** (0.31)	-0.892*** (0.34)	-0.969** (0.38)	0.038*** (0.01)
<i>ROA</i>	-0.485 (0.50)	-0.794 (0.57)	-0.743 (0.57)	-1.094 (0.72)	-0.758 (0.57)
<i>Noninterest</i>	-1.638 (3.47)	-1.431 (3.36)	-1.481 (3.39)	-5.037 (4.88)	-1.102 (3.36)
<i>Inflat</i>	0.256** (0.11)	0.224** (0.10)	0.310*** (0.12)	0.306** (0.12)	0.209** (0.10)
<i>Unemployment</i>	0.666*** (0.19)	0.607*** (0.18)	0.650*** (0.18)	0.693*** (0.23)	0.583*** (0.18)
<i>GDP Growth</i>	0.478** (0.21)	0.441** (0.21)	0.439** (0.20)	0.861** (0.35)	0.492** (0.21)
<i>Stock to GDP</i>	-0.488 (0.81)	1.915*** (0.66)	-0.474 (0.83)	-2.277** (1.01)	-0.693 (0.86)
<i>Constant</i>	1.509*** (0.28)	1.822*** (0.44)	1.918*** (0.45)	2.194*** (0.59)	1.914*** (0.45)
Observations	10,575	10,575	10,575	8,570	10,575
R-squared	0.267	0.267	0.267	0.264	0.266
Year FEs	Yes	Yes	Yes	Yes	Yes
Bank FEs	Yes	Yes	Yes	Yes	Yes

Table 7. Country heterogeneous effect of board reform

This table presents the Country heterogeneous effect of board reform. *NonNA* takes value of 1 for the countries beside Canada and the US. We use the sample including Canada and the US data in this part. The data of North America comes from CRSP-Compustat database. All control variables are lagged by one year. Standard errors clustered at the bank level are reported in parentheses. The indicators *, **, and *** represent significance levels of 10%, 5%, and 1%, respectively.

<i>Dep. Var. =</i>	(1)	(2)	(3)
		<i>TobinQ(t+1)</i>	
<i>Post*NonNA</i>	0.022*** (0.00)	0.015*** (0.00)	0.011*** (0.00)
<i>Post</i>	-0.006** (0.00)	0.002 (0.00)	0.006** (0.00)
<i>lnAsset</i>		-0.112 (0.07)	-0.060 (0.07)
<i>ROA</i>		1.176*** (0.09)	1.045*** (0.09)
<i>Leverage</i>		0.093** (0.04)	0.097*** (0.04)
<i>Noninterest</i>		2.821*** (0.71)	2.074*** (0.70)
<i>Inflat</i>			-0.061 (0.04)
<i>Unemployment</i>			-0.038 (0.04)
<i>GDP growth</i>			0.075** (0.03)
<i>Stock to GDP</i>			2.055*** (0.16)
<i>Constant</i>	1.028*** (0.00)	0.938*** (0.03)	0.846*** (0.03)
Observations	20,099	20,099	20,099
R-squared	0.615	0.628	0.636
Year FEs	Yes	Yes	Yes
Bank FEs	Yes	Yes	Yes

Table 8. Robustness check

This table illustrates the robustness check result. In panel A, we add the additional event (board reform) fixed effects in the regression. In panel B, we restrict the sample within the 5 years around the board reform and drop the observations in the countries that never implements the board reform. In panel C, we additionally include the sample in Canada and US. The data of North America comes from CRSP-Compustat database. The variable definitions are provided in Appendix A. All control variables are lagged by one year. Standard errors, clustered at the bank level and robust to heteroscedasticity, are reported in parentheses. The indicators *, **, and *** represent significance levels of 10%, 5%, and 1%, respectively.

Panel A: Additional fixed effects

<i>Dep. Var. =</i>	(1)	(2)	(3)
		<i>TobinQ(t+1)</i>	
<i>Post</i>	0.084*** (0.02)	0.084*** (0.02)	0.077*** (0.02)
<i>lnAsset</i>		-0.530** (0.25)	-0.927** (0.37)
<i>ROA</i>		-1.039 (0.65)	-1.119 (0.72)
<i>Leverage</i>		-1.132* (0.60)	-1.145* (0.61)
<i>Noninterest</i>		-4.835 (4.78)	-5.056 (4.88)
<i>Inflat</i>			0.273** (0.12)
<i>Unemployment</i>			0.671*** (0.22)
<i>GDP Growth</i>			0.848** (0.35)
<i>Stock to GDP</i>			-2.210** (1.00)
<i>Constant</i>	0.983*** (0.01)	2.105*** (0.56)	2.182*** (0.58)
Observations	8,570	8,570	8,570
R-squared	0.261	0.263	0.264
Year FEs	Yes	Yes	Yes
Bank FEs	Yes	Yes	Yes
Event FEs	Yes	Yes	Yes

Panel B: Alternative sample window [-5, +5] sample

<i>Dep. Var. =</i>	<i>TobinQ(t+1)</i>		
<i>Post</i>	0.053*** (0.02)	0.053*** (0.02)	0.047** (0.02)
<i>lnAsset</i>		-0.290 (0.36)	-0.236 (0.44)
<i>ROA</i>		-2.651* (1.60)	-3.602* (1.89)
<i>Leverage</i>		-1.615 (1.27)	-1.732 (1.31)
<i>Noninterest</i>		-4.289	-6.008

		(8.64)	(8.79)
<i>Inflat</i>			0.095
			(0.15)
<i>Unemployment</i>			-0.779*
			(0.42)
<i>GDP Growth</i>			1.780**
			(0.75)
<i>Stock to GDP</i>			-0.755
			(1.19)
<i>Constant</i>	1.034***	2.579**	2.730**
	(0.02)	(1.16)	(1.22)
Observations	4,034	4,034	4,034
R-squared	0.459	0.461	0.462
Year FEs	Yes	Yes	Yes
Bank FEs	Yes	Yes	Yes

Panel C Including US and Canada

<i>Dep. Var. =</i>	<i>TobinQ(t+1)</i>		
<i>Post</i>	0.006**	0.010***	0.012***
	(0.00)	(0.00)	(0.00)
<i>lnAsset</i>		-0.171***	-0.098
		(0.07)	(0.07)
<i>ROA</i>		1.218***	1.059***
		(0.09)	(0.09)
<i>Leverage</i>		0.097***	0.099***
		(0.04)	(0.04)
<i>Noninterest</i>		2.618***	1.953***
		(0.71)	(0.70)
<i>Inflat</i>			-0.066
			(0.04)
<i>Unemployment</i>			-0.067*
			(0.04)
<i>GDP Growth</i>			0.088***
			(0.03)
<i>Stock to GDP</i>			2.063***
			(0.16)
<i>Constant</i>	1.027***	0.940***	0.849***
	(0.00)	(0.03)	(0.03)
Observations	20,099	20,099	20,099
R-squared	0.613	0.627	0.636
Year FEs	Yes	Yes	Yes
Bank FEs	Yes	Yes	Yes

Table 9 Placebo test

This table illustrates the placebo test result. We first create placebo reform year that is 3 years before real board reform year. Then *PlaceboPost* takes value of 1 if the observation is in or after the placebo reform year and takes value of 0 otherwise. The variable definitions are provided in Appendix A. All control variables are lagged by one year. Standard errors, clustered at the bank level and robust to heteroscedasticity, are reported in parentheses. The indicators *, **, and *** represent significance levels of 10%, 5%, and 1%, respectively.

<i>Dep. Var. =</i>	(1)	(2)	(3)
		<i>TobinQ(t+1)</i>	
<i>PlaceboPost</i>	-0.005 (0.01)	-0.011 (0.01)	-0.012 (0.01)
<i>lnAsset</i>		-0.372* (0.21)	-0.651** (0.31)
<i>ROA</i>		-0.781 (0.54)	-0.784 (0.57)
<i>Leverage</i>		-0.935** (0.47)	-0.930** (0.47)
<i>Noninterest</i>		-1.278 (3.40)	-1.377 (3.39)
<i>Inflat</i>			0.202** (0.10)
<i>Unemployment</i>			0.643*** (0.18)
<i>GDP growth</i>			0.520** (0.22)
<i>Stock to GDP</i>			-0.726 (0.87)
<i>Constant</i>	1.049*** (0.01)	1.958*** (0.44)	1.949*** (0.46)
Observations	10,575	10,575	10,575
R-squared	0.264	0.265	0.266
Year FEs	Yes	Yes	Yes
Bank FEs	Yes	Yes	Yes

Appendix

Appendix A. Variable definition

Abbreviation	Calculation	Data Source
<i>TobinQ</i>	$(\text{Total asset(at)} + \text{Market value(mkv)} - \text{total equity value(teq)}) / \text{Total asset(at)}$	Compustat-Global-Stock Daily and Fundamental Annual
<i>Post</i>	equal to 1 after the board reform and 0 otherwise	Fauver et al. (2017).
<i>lnAsset</i>	The logarithms of total asset(at)	Compustat-Global-Fundamental annual
<i>ROA</i>	$\text{Income before extraordinary item(ib)} / \text{Total asset(at)}$	Compustat-Global-Fundamental annual
<i>Leverage</i>	$\text{Total liabilities(lt)} / \text{Total asset(at)}$	Compustat-Global-Fundamental annual
<i>Noninterest</i>	$\text{Non-interest income(initb)} / (\text{Non-interest income(initb)} + \text{Interest income(idit)})$	Compustat-Global-Fundamental annual
<i>GDP Growth</i>		World Bank
<i>Stock to GDP</i>	$\text{The logarithms of stock trade total value} / \text{Total domestic stock value}$	World Bank
<i>Unemployment</i>	$\text{Unemployment total (\% of total labor force (national estimate))} / 100$	World Bank
<i>Inflat</i>	$\text{Inflation rate(\%)} / 100$	World Bank

Appendix B. Data processing procedure

Step	Stage	Observation remained
1	Raw data downloaded from Compustat Global Fundamental annual database, ranging from 1990-2015	593907
2	Filter the banks with ggroup=4010 or sic=6020 or 6029 or 6021 or 6022	21443
3	Drop the duplicated data with the symbol of gvkey+fyear	21427
4	Merge the data with stock daily data from Compustat Global database. Calculate the bank-level variable and drop the missing value	13596
5	Merge the data with macro-economic data from World Bank website and drop the missing value	10656
6	Drop the singleton observations	10575

Appendix C. Country-Specific Board Reforms in the Banking Industry

Country	Year	Reform Content
Australia	2004	CLERP 9 Act: Mandated audit independence, enhanced financial disclosures, and required boards to certify financial statements. Improved transparency in executive compensation.
Austria	2004	EU Compliance: Adopted Basel II norms, emphasizing risk-weighted capital adequacy. Strengthened board oversight of risk management and internal controls.
Belgium	2005	Corporate Governance Code: Required boards to include independent directors, established audit and risk committees, and enhanced disclosure of executive pay.
Brazil	2002	Basel I Implementation: Enforced stricter capital adequacy rules. Introduced board accountability for risk management and anti-money laundering compliance.
Chile	2001	Banking Law Reform: Enhanced board independence, mandated separation of CEO and board chair roles, and improved oversight of related-party transactions.
China	2001	WTO Entry Reforms: State-owned banks restructured boards to include independent directors. Introduced Basel I-aligned capital requirements.
Colombia	2001	Financial Supervisory Reforms: Strengthened board responsibilities for liquidity risk management and corporate governance disclosures.
Czech Republic	2001	EU Harmonization: Adopted EU directives on board composition (minimum independent directors) and audit committee establishment.
Denmark	2001	Financial Business Act: Required boards to formalize risk management policies and enhance transparency in financial reporting.
Finland	2004	Corporate Governance Code: Mandated board independence (at least 50% non-executives) and stricter audit committee rules.
France	2003	Financial Security Law: Required boards to certify internal controls and audit reports. Separated CEO and board chair roles in large banks.
Germany	2002	Corporate Governance Code: Introduced "comply-or-explain" rules for board independence, risk oversight, and executive pay transparency.
Greece	2002	Banking Sector Reforms: Aligned with EU norms; boards required to establish audit committees and disclose governance practices.
Hong Kong	2005	Code on Corporate Governance: Mandated independent directors on boards, enhanced audit committee roles, and improved risk disclosure.

Country	Year	Reform Content
Hungary	2003	EU Accession Reforms: Adopted Basel II principles, requiring boards to oversee capital adequacy and operational risk frameworks.
India	2002	SEBI Guidelines: Mandated audit committees with independent directors and enhanced board oversight of financial reporting.
Indonesia	2007	Banking Law Amendments: Post-Asian crisis reforms required boards to include independent commissioners and strengthen risk management.
Israel	2000	Banking Ordinance: Enhanced board accountability for anti-fraud measures and introduced Basel I capital requirements.
Italy	2006	Consolidated Financial Act: Strengthened board independence, required risk committees, and aligned with EU directives.
Japan	2002	Financial Instruments Law: Improved board oversight of internal controls and mandated independent directors in large banks.
Korea	1999	Post-Asian Crisis Reforms: Restructured boards to include outside directors, enforced Basel I standards, and improved transparency.
Malaysia	2001	Financial Sector Masterplan: Required boards to establish risk management committees and adopt Basel II norms.
Mexico	2001	Banking Law Amendments: Enhanced board independence and mandated audit committees with external experts.
Netherlands	2004	Corporate Governance Code: "Comply-or-explain" rules for board diversity, independence, and executive pay disclosure.
Norway	2005	Financial Supervision Act: Required boards to formalize risk management frameworks and improve liquidity oversight.
Pakistan	2002	Banking Companies Ordinance: Introduced Basel I capital rules and mandated board oversight of credit risk.
Peru	2005	Banking Sector Reform: Strengthened board accountability for anti-money laundering compliance and capital adequacy.
Philippines	2002	General Banking Law: Mandated independent directors, audit committees, and Basel I compliance.
Poland	2002	Banking Act Amendments: Aligned with EU norms; required boards to oversee operational risk and internal controls.
Portugal	2001	EU Harmonization: Adopted Basel II standards and mandated audit committees with independent members.
Singapore	2003	Code of Corporate Governance: Required boards to have 1/3 independent directors and formalize risk management policies.

Country	Year	Reform Content
Spain	2006	Financial System Law: Enhanced board independence, mandated risk committees, and improved governance disclosures.
Sweden	2006	Corporate Governance Code: Strengthened board oversight of executive pay and required gender diversity initiatives.
Switzerland	2002	Banking Secrecy Reforms: Introduced board accountability for anti-money laundering controls and capital adequacy rules.
Thailand	2002	Post-1997 Crisis Reforms: Mandated independent directors and audit committees in banks. Adopted Basel I standards.
Turkey	2002	Banking Regulation Agency: Enforced board independence, risk management frameworks, and Basel I compliance.
Egypt	2002	Central Bank Reforms: Required boards to oversee liquidity risk and adopt international accounting standards.
United Kingdom	1998	Combined Code: Separated CEO/chair roles, mandated audit committees, and enhanced board independence in listed banks.