

Age diversity, directors' personal values, and bank performance

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ABSTRACT

This study examines the effects of board diversity on bank profitability and risk. Using a sample of 97 Chinese banks over a period from 2009 to 2013, we find that board age diversity is negatively associated with bank profitability. To further investigate why age-diverse boards influence bank performance, we decompose board age diversity into diversity of directors' personal values, utilizing the World Values Survey. Our findings suggest that the heterogeneity among directors' views on risk, prudence, and wealth is more likely to spark intragroup conflicts in the decision-making process. This prevents the board from functioning effectively and ultimately weakens bank profitability. Our results are robust with respect to alternative measures of diversity and bank performance.

1. Introduction

Corporate governance in banks has received increasing attention in the wake of the 2008 financial crisis. Notably, poor bank governance is more likely to trigger a bank failure, leading to serious systemic risk and negative externalities (e.g., Haan & Vlahu, 2016; Pathan & Faff, 2013). The Basel Committee on Banking Supervision (BCBS) recently issued a set of “Guidelines on Corporate Governance Principles for Banks” to emphasize the importance of effective governance for sound functioning of banks and the economy as a whole (BCBS, 2014). The report expands guidance on the roles of board of directors, specifically pointing out that the bank board should be composed of a diverse set of directors to reflect its complexity in operation.

Compared with other attributes of directors (i.e., gender and ethnicity),¹ age, which is a key diversity dimension, so far has attracted little attention in the finance literature. When profiling an individual, age is a dynamic proxy of an individual's life experience (Mannheim, 1949) and encompasses a wide range of factors that influence the formation of personal values during our lifespan (Medawar, 1952; Rhodes, 1983). Whether an age-diverse board provides comprehensive resources and expertise or leads to communication breakdown and conflicts remains as an open question. To date, however, studies on board diversity in banks have largely focused on developed countries (e.g., Adams & Mehran, 2012; Farag & Mallin, 2017; García-Meca, García-

Sánchez, & Martínez-Ferrero, 2015; Hagendorff & Keasey, 2012). To shed light on this issue in emerging markets in which the banking sector grows faster than their developed world counterparts, we choose to explore China as a context for board age diversity.²

China, as a major emerging economy, has gained an increased influence in the world economy. The Chinese banking sector has surpassed that of Eurozone to become the world's largest by size. At the end of 2016, the total assets of the Chinese banking system hit \$33 trillion (versus \$31 trillion for the Eurozone). Furthermore, banks in China dominate the financial system, and the value of the Chinese banking system reached more than three times the size of China's annual economic outputs in 2016. Given the huge size and unique position in the economy, the Chinese banking sector has gained an increased influence in the world financial system. Compared to developed markets, the board of directors in China plays an important role through its advising and monitoring activities in an environment with weak institutions and weak investor protections. Different from other emerging markets such as Eastern European countries, the gradual reform approach taken by the Chinese government (Jiang, Yao, & Zhang, 2009) provides us a chance to explore the diversity among directors of different ages who have experienced reform over time. We hope that our results can be generalized to other emerging markets that have experienced similar degrees of cultural, social, and economic reforms.

Age diversity is particularly important in countries that have

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¹ Increasing attention has been recognized to board diversities by gender (Erhardt, Werbel, & Shrader, 2003; Farag & Mallin, 2017; Liu et al., 2014; Sila et al., 2016), nationality (García-Meca et al., 2015; Ruigrok, Peck, & Tacheva, 2007) and ethnicity (Carter et al., 2003; Carter, D'Souza, Simkins, & Simpson, 2010) for both financial and non-financial firms.

² Chinese banks have a two-tier board system, including a board of directors and a board of supervisors. This study focuses on the board of directors, which is more functional, while the supervisory board seems to be decorative and is regarded as a “nominal organ” in China (e.g., Dahya et al., 2003; Tam, 1995).

experienced significant transformations over a relatively short period of time. Along with the transition of the economic system, there has simultaneously been a push towards cultural change (Stulz & Williamson, 2003). For example, in China, under Chairman Mao's socialist orthodoxy,³ people are more likely to be less educated and are dedicated to a conventional way of doing things, sacrificing creativity (Ralston, Egri, Stewart, Terpstra, & Kaicheng, 1999). While under Deng Xiaoping's modern policies, people are likely to be better educated, more qualified, confident, and individualistic and place emphasis on innovation and creativity (Huang, Wang, & Li, 2015; Tian, 1998; Vohra, 2000). Therefore, growing up in each distinctive cultural environment, the Chinese directors in different age cohorts tend to hold diverse values that can affect the quality and process of decision-making.⁴

To study the link between board age diversity and bank performance, we examine a sample of 97 Chinese banks over the period from 2009 to 2013. To date, very little is known about why age diversity may affect bank performance. To further investigate this relationship, we link directors' age to directors' personal values. Given the fact that individuals' values are not observable, we utilize the World Values Survey to construct the measure of directors' values on work-related indicators.⁵ We first employ the propensity score matching method to identify a matched subgroup of respondents in the survey who have similar characteristics with bank directors in our sample. We then use the estimated parameters based on this matched subgroup combined with our individual bank directors' characteristics to compute individual bank directors' values.

We document a negative relationship between age diversity and bank profitability measured by return on assets (ROA) and return on equity (ROE), indicating that the costs of age diversity outweigh its benefits on bank profitability in China. To address the potential endogeneity problem, we employ the fixed effect instrumental variable approach using Lewbel's (2012) method and the dynamic panel Generalized Methods of Moment (GMM) analysis and obtain consistent results. When decomposing age diversity into value diversity, we find that the heterogeneity in directors' values on risk, prudence, and wealth creates additional obstacles for efficient functioning of corporate boards and reduces banks' profitability, while the variations in directors' value on success, creativity, and slackness fail to have any influence on bank performance.

Our study contributes to the existing literature in several ways. First, our work offers a new perspective in understanding the impact of board age heterogeneity on firm performance. Earlier literature mostly focuses on the direct relationship between age diversity among directors and organizational outcomes (Ali, Ng, & Kulik, 2014; Ararat, Aksu, & Tansel Cetin, 2010; Goergen, Limbach, & Scholz, 2015; Hafsi & Turgut, 2013; Mahadeo, Soobaroyen, & Hanuman, 2012; Tarus & Aime, 2014). Our work takes a step further to examine why age diversity can affect bank performance by introducing directors' personal values, an unobservable dimension of diversity. Second, to the best of our knowledge, this is the first study to compute directors' personal values and provide empirical evidence that directors' values change across generations. Finally, we provide the first empirical study on board age (value) diversity and bank performance in China. The banking sector serves as an engine of economy growth in China and has undergone governance reform with special emphasis on boards. However, existing

studies on bank boards in China are very limited; note that there is a single exception (i.e., Liang, Xu, & Jiraporn, 2013) on board composition and directors' political connections with bank performance.

The rest of the paper proceeds as follows. Section 2 introduces the institutional background of the Chinese banking sector. Section 3 discusses the theoretical perspective of board diversity, followed by the hypothesis development on board age diversity, value diversity, and bank performance in Section 4. Section 5 describes the data collection procedure and methodology. Section 6 presents the main results and is followed by a series of robustness tests in Section 7. Section 8 offers a summary and the conclusions.

2. Institutional background

The Chinese banking sector has experienced a series of reforms over the last forty years, transferring from a monopolistic and policy-driven system to a multi-ownership and market-oriented one. In the first period of reform (1979–1994), the Chinese banking sector has undergone an institutional restructuring and created the “two-tier” banking system, including the People's Bank of China (the central bank) and four large state-owned commercial banks (SOCBs): Industrial and Commercial Bank of China (ICBC), China Construction Bank of China (CCBC), Bank of China (BOC), and Agricultural Bank of China (ABC). Between 1985 and 1992, a more intensely competitive environment was created with the establishment of a number of nationwide and regional joint-stock commercial banks whose main objective was profit maximization.

In the second period of reform (1994–2002), Chinese banks were commercialized even further. In 1995, the Chinese authorities merged the urban credit cooperatives into city commercial banks (CCBs). In the same year, the *Commercial Banking Law* was put into effect, which requires having a board of directors with professional knowledge when setting up commercial banks. In 2002, the People's Bank of China issued *Guidance on Independent Directors and External Supervisors of Joint-Stock Commercial Banks* to establish and enhance the arrangements of independent directors (e.g., experience, expertise, independence).

In the final period (2003 – present), Chinese banks have been experienced on-going deep governance reform. In 2003, the China Banking Regulatory Commission (CBRC), the banking regulatory body, was set up to take the overall responsibilities of formulating rules and regulations, supervising the banking sector and enhancing corporate governance. The SOCBs were restructured into modern joint-stock firms with sound corporate governance and were listed on the national and international stock exchanges. Apart from the privatization of SOCBs, foreign strategic investors were encouraged to bring capital and advanced governance into the Chinese banks.

The board has been placed as a key in the bank governance reform in China. The *Corporate Law* requires banks to establish a two-tier board structure, including a board of directors and a supervisory board. As the *Company Law* does not subject supervisors to any legal liability, the supervisory board, so far, seems to be more decorative and is regarded as a “nominal organ” in China (e.g., Chen, Firth, Gao, & Rui, 2006; Dahya, Karbhari, Xiao, & Yang, 2003; Tam, 1995). To improve the effectiveness of the board of directors, the CBRC issued a series of guidelines on bank governance.⁶ The board of directors is ultimately responsible for the operation and management of a commercial bank. In addition to the responsibilities stipulated in the laws and regulations (e.g., *Corporate Law* and rules for commercial banks), the bank board should also develop the operation and development strategy and monitor its implementation. In addition to its monitoring and advising roles, the board also involves in risk management, setting internal

³ In 1949, the Chinese Civil War ended with Mao Zedong's Communist Party in power. Mao's era covers Communist Consolidation (1949–1965) and Great Cultural Revolution (1966–1976), while Deng Xiaoping initiated the Social Reform Era (1978–1992) and part of the Societal Transition Era (1992–now) (Egri & Ralston, 2004; Ralston et al., 1999; Sun & Wang, 2010).

⁴ Regarding other dimensions of board diversity, our sample shows that directors in Chinese banks are homogeneous in nationality and ethnicity, and a small proportion of directors are female.

⁵ 17 value indicators are extracted from the World Values Survey: risk, work, happiness, prudence, wealth, success, thoroughness, pressure, outgoing, active, creativity, helping others, finding faults, reserved, life satisfaction, slackness, and tension.

⁶ The CBRC issued the “Guidelines on Board of Directors of Joint Stock Commercial Banks” in 2005 and “Pilot Measures for Evaluating the Performance of Directors of Commercial Banks” in 2010.

control policies, capital planning, and taking the ultimate responsibility for the management of the capital adequacy ratio. Besides shareholders, the board should also safeguard the interest of depositors and other stakeholders.

Previous studies on corporate governance in Chinese banks have mainly focused on the ownership structure (e.g., Berger, Hasan, & Zhou, 2009; Dong, Meng, Firth, & Hou, 2014; Jiang, Yao, & Feng, 2013; Lin & Zhang, 2009). Researchers have only recently started to explore the role of bank boards. Liang et al. (2013) find that board meetings and independence are positively related with performance, while board size poses a negative effect. Qian, Zhang, and Liu (2015) find that banks with more politically connected directors exhibit lower prudential behavior. So far, no study has investigated board diversity in Chinese banks.

3. Theoretical perspective on board diversity

Existing theoretical framework on the relationship between board diversity and firm performance is not based on a single theory, but instead draws on various perspectives including agency theory, resource dependency theory, human capital theory, and social psychology theory.

Based on agency theory, the board of directors is an important internal mechanism to mitigate the conflicts between shareholders and managers (Fama & Jensen, 1983). Board diversity can increase board independence, since diversity can bring more ultimate outsiders into boards and enhance mutual monitoring (Kandel & Lazear, 1992; Wiersema & Bantel, 1992). An appropriate mix of diverse directors can better exercise their monitoring role when they provide high-quality and impartial advice. However, Carter, Simkins, and Simpson (2003) and Hermalin and Weisbach (2003) argue that agency theory does not provide a clear prediction, since board diversity may not lead to more effective monitoring because diverse board members may be marginalized.

According to resource dependence theory (Pfeffer & Salacik, 1978), firms depend on their external environment to survive. The key to reduce the dependencies is to establish a linkage with external entities and acquire resources. In this process, the corporate board occupies an important role: it is the provider of advice and counsel, legitimacy and communication channels (Pfeffer & Salacik, 1978). Directors of different ages expand the board member networks and contacts. The network may lead firms to benefit from improved access to their external constituents (Hillman, Cannella, & Paetzold, 2000). Specifically, the network of an age-diverse board may provide better access to capital and regulators (Macey & O'hara, 2003) and enable the bank to meet the needs of different customers and penetrate deeper into the market (Mishra & Jhunjhunwala, 2013).

Human capital theory complements resource dependence theory in some aspects. Directors with different educational background, knowledge, skills, and experiences provide their own unique human capital to the boardroom, which benefits the outcome of the firm (Becker, 1964; Terjesen, Sealy, & Singh, 2009). Older directors tend to be more knowledgeable and experienced, while younger directors are more energetic and have a greater appetite for adventures and new technologies (Mishra & Jhunjhunwala, 2013). Therefore, an age-diverse board may further an organization's understanding of its current marketplace and industry dynamics and improve its performance.

In contrast, board age diversity may come at a cost and hamper firm performance. On the basis of the “similarity-attraction paradigm” (Byrne, 1971), individuals perceive other people who are demographically different from them as “outsiders”. People tend to be reluctant to share information with “outside” individuals, leading to interpersonal attraction breakdown (Adams, Hermalin, & Weisbach, 2010; Estéyri & Nisar, 2016). According to social psychology theories, when it comes to boards, different perspectives and cognitive abilities in the board may generate conflicts among different groups of directors

(Byrne, 1971; Williams & O'Reilly, 1998). Such conflicts are likely to hinder the development of boardroom cohesiveness, produce barriers for communication, protract decision-making processes, and weaken firm performance (Wang & Hsu, 2013; Westphal & Bednar, 2005).

4. Literature review and hypothesis development

4.1. Board diversity in the banking sector

Given the complexity in bank operation and opacity in bank lending activities, the role of bank directors is especially important, as the other stakeholders are not able to impose effective governance (Levine, 2004). For example, banks rely on depositors for funding. However, it is difficult for depositors to monitor the managers because of information asymmetry and high coordination costs (Demirgüç-Kunt & Detragiache, 2002). Thus, directors in banks should align the manager not only with the interests of shareholders but also with that of depositors. Furthermore, holding a unique position in the economy, the failure of an individual bank will cause a spillover effect on other financial institutions. The banking industry is more heavily regulated than non-financial firms. Compared to non-financial firms, bank directors are subject to more scrutiny and should also be accountable to regulators. The existing literature on board diversity has largely focused on non-financial firms, while only a handful of studies provide empirical evidence on the impact of bank board diversity (i.e., gender and nationality) on financial risk (Farag & Mallin, 2017), bank performance (García-Meca et al., 2015; Pathan & Faff, 2013), and bank growth strategies (De Cabo, Gimeno, & Nieto, 2012).

4.2. Board age diversity, bank profitability, and risk

Age diversity may have positive or negative effects on bank profitability. On the one hand, age diversity may improve the experiences, resources, knowledge, and networks of the board, which in turn improve bank profitability. On the other hand, age diversity may suffer from cognitive conflicts and lower group cohesion, which harm bank profitability. The existing research on board age diversity tends to focus on non-financial firms and have so far provided mixed evidence. Some studies show that age-diverse boards lead to improved firm financial performance (Ararat et al., 2010; Kim & Lim, 2010; Mahadeo et al., 2012), while others find that age diversity weakens firm social performance (Hafsi & Turgut, 2013), profitability (Ali et al., 2014), and strategic changes (Tarus & Aime, 2014). However, the board age diversity in the banking sector has received scant attention, except for one study by Hagendorff and Keasey (2012). They examine the US commercial banks and find that board age diversity is associated with wealth losses surrounding acquisition announcements. Given that age diversity may have both positive and negative effects on profitability, we hypothesize that:

H1a. Board age diversity is positively associated with bank profitability.

H1b. Board age diversity is negatively associated with bank profitability.

In terms of risk, no study has investigated the effect of board age diversity on firm risks. Regarding the relationship between age and risk, young managers are found to have higher propensity to make risky decisions (Cheng, Chan, & Leung, 2010) to signal to the market that they possess superior abilities (Prendergast & Stole, 1996). Older managers prefer lower risk due to the threat to financial security and are associated with lower financial leverage, lower capital expenditures, and higher cash holdings (Berger, Kick, & Schaeck, 2014; Bertrand & Schoar, 2003). However, when career concerns dominate, younger managers may be more risk-averse since they face more uncertainty about their future career than their older counterparts

(Holmstrom, 1999), while older managers are not afraid of career concerns due to their cumulative human capital (Nguyen, Hagendorff, & Eshraghi, 2015). At the board level, age diversity may impact the process and the quality of decision making. It may result in more board scrutiny and lead to less extreme outcomes (i.e., lower risk). However, age diversity may cause conflicts and make it difficult to reach a consensus. The extended decision-making process may expose banks to higher risk when it could not adjust their policy in time. Given that board age diversity can be seen a “double-edged-sword”, we hypothesize the following:

H1c. Board age diversity is positively associated with bank risk.

H1d. Board age diversity is negatively associated with bank risk.

4.3. Board value diversity, bank profitability, and risk

During the life span, aging involves a wide range of factors that influence the development of personal values, such as risk-taking behavior, decision-making, and attitudes towards work (Child, 1974; Ferris, Judge, Chachere, & Liden, 1991; Medawar, 1952; Rhodes, 1983; Serfling, 2014; Sun & Wang, 2010). Existing studies suggest that there are significant value differences among managers across age cohorts. Younger managers appear to be more creative with a greater risk appetite and are found to have a higher probability to challenge the existing system of company rules (Bantel & Jackson, 1989; Child, 1974; Hambrick & Mason, 1984; Mishra & Jhunjhunwala, 2013). Older managers tend to be more cautious and conservative (Bantel & Jackson, 1989), and are more capable in dealing with external agencies such as regulators and authorities (Grove, Patelli, Victoravich, & Xu, 2011).

At the group level, individuals of similar age prefer to interact with those whom they perceive to be similar to them. This can be explained by the “similarity-attraction paradigm”, where individuals born at similar times are more likely to develop similar views on their life experience. Such similarity, in turn, fosters interpersonal attraction, group thinking, and cooperation (Byrne, 1971; Goergen et al., 2015; Kunze, Boehm, & Bruch, 2011; Zenger & Lawrence, 1989). The values of each generation change in accordance with the prevailing condition during their formative years (Inglehart, 2008). Age difference is likely to lead to variation in personal values (Bantel & Jackson, 1989; Egri & Ralston, 2004; Sun & Wang, 2010). In turn, the difference in values causes a generation gap between young and old people (Prasad, 1992).

Value diversity occurs when members of a board differ in terms of what they value, especially between young and old members. In many cases, the value difference can lead to disagreements and conflicts, which can in turn harm bank performance both in profitability and risk (Jehn, Northcraft, & Neale, 1999). However, given the complexity in bank tasks, discussing and debating competing perspectives and approaches can be essential for a group to identify an appropriate strategy and to increase the accuracy of assessments of the situation (Jehn et al., 1999). Therefore, it may increase bank profitability and lower its risk. Thus, we hypothesize the following:

H2a. Board value diversity positively affects bank profitability.

H2b. Board value diversity negatively affects bank profitability.

H2c. Board value diversity positively affects bank risk.

H2d. Board value diversity negatively affects bank risk.

5. Data and methodology

5.1. Data and sample selection

We build a sample of 97 Chinese banks during the period 2009–2013. We start with the universe of 190 Chinese banks available on Bankscope. We focus on commercial banks, cooperative banks, and

savings banks. To allow hand-collection of data on the board and ownership structure, we exclude banks that fail to have at least one annual report during the study period. We focus on banks that disclose directors' demographic characteristics, especially age, in their annual reports. The filtering procedure results in a final sample of 97 banks, which represents about three quarters of the total assets of Chinese banking institutions at the end of 2013 (China Banking Regulatory Commission, 2014).

Bank-specific financial information is mainly extracted from Bankscope. We replace the missing values and questionable values in Bankscope by hand-collected data from each individual bank's annual report. Most of the banks in our sample follow the local GAAP Chinese Accounting Standards (CAS), while the listed commercial banks employ the International Financial Reporting Standards (IFRS).⁷ The CAS was developed recently following the principle of IFRS, and there is no material difference between the financial statements of the same bank under IFRS and CAS (Berger et al., 2009; Liang et al., 2013). The data for the economic indicator (i.e., GDP per capita) are extracted from China City Statistical Yearbook published by China Statistics Press.

To predict individual director's values, we employ the World Values Survey Sixth Wave, a cross-country project containing information about demographics, self-reported economic information, and answers to specific questions on fifteen categories of values on the economy, work ethics, religions, democracy, and other attitudes. The China Survey was conducted in 2012 and measures values and attitudes held by Chinese citizens. The respondents are aged from 18 to 75, and they reside in all provinces of China. In our study, the World Values Survey (China 2012)⁸ is employed to predict the values of Chinese directors. From this survey, we extract work-related value indicators.

Among the 6195 directors who served on the board of sample banks, we have 177 (around 2%) foreign directors from 12 other countries/regions. To predict foreign directors' values, we also download the respective 12 foreign countries/regions' World Values Surveys, including the United Kingdom, the United States, the Switzerland, Spain, the Netherlands, Taiwan, Singapore, Germany, Australia, France, Hong Kong, and Italy.

5.2. Model specifications and descriptive statistics

5.2.1. Board age diversity

To examine the impacts of board age diversity on bank performance, we employ the following Model (1):

$$\text{Bank Performance}_{i,t} = \alpha + \beta \text{Board Age Diversity}_{i,t-1} + X_{i,t-1} \delta + \theta_t + \mu_i + \varepsilon_{i,t} \quad (1)$$

where i is the bank identifier, and t is the year. Model (1) is estimated by a fixed-effects estimator, which is justified using the Hausman Test. The key coefficient of interest β captures the impact of board age diversity on bank performance. μ is an individual-specific effect that varies across banks, and θ_t is the year fixed effect. ε denotes to the error term, which varies both among banks and periods of time. All of the independent variables are lagged by one year. The reported standard errors are adjusted for potential heteroscedasticity.

Bank Performance is captured by both profitability and risk. As for profitability, return on assets (ROA) is calculated as net income divided by total assets and shows how efficiently the bank produces profit by the given assets. Return on equity (ROE) is calculated as net income divided by total equity, assessing the return on shareholders' investment. As alternative measures, *Net Interest Margin* is measured by net interest income divided by total earning assets. Since one of a bank's

⁷ 18 Chinese banks in our sample are listed.

⁸ The World Values Survey has six waves, and each wave has a five-year period. In each wave, there is only one survey for one country. In our study, we employ the China Survey (2012), which covers most of the period (2009–2013) in our sample.

primary functions is to issue liabilities and use the proceeds to purchase income-earning assets, *higher Net Interest Margin* reflects higher bank profitability. The *Pre-Provision Profit Ratio* is calculated as the difference between operating income and operating expense to total assets. The *Pre-Provision Profit Ratio* provides a reasonable estimate as to what the bank expects to have left for operating profit once it eventually incurs cash outflows due to defaulted loans. In terms of risk, the Z-score, defined as the return on assets plus the equity-to-assets ratio divided by the standard deviation of the return on assets, is the inverse of the probability that the bank losses surmount bank capital⁹ and measures the distance to default (Dong et al., 2014; Laeven & Levine, 2009). Thus, a higher Z-score indicates lower risk. Since Z-scores are highly skewed, we take the natural log of the Z-score (*Z-score*) in further analysis. We also use non-performing loan ratio (*NPLratio*), calculated as non-performing loans to total loans, as an alternative risk measure.

Panel A of Table 1 reports the descriptive statistics for the bank performance. During the sample period, the average ROA and ROE are 0.01 and 0.19, respectively, which is comparable to 0.01 and 0.14 in Liang et al. (2013), who study a sample of 52 Chinese banks during the period from 2003 to 2010. The average Z-score value is 3.88. On average, *NPLratio* is 0.01, which is smaller compared to 0.03 in Dong et al. (2014) for a sample of Chinese commercial banks during 2003–2011.

Board Age Diversity is measured by the coefficient of variation of age (CV) calculated by the ratio of the standard deviation of board age to mean of board age.¹⁰

Fig. 1 and Panel B of Table 1 show substantial board age diversity in Chinese banks. Our sample shows that most of the directors in Chinese banks are aged from 35 to 70, and therefore grew up in Mao Zedong's or Deng Xiaoping's era. The average age of directors in Chinese banks is 51.95, and the standard deviation is high at 7.99. The youngest is 29 years old, while the oldest is 83. The average coefficient of variation of board age (CV) is 0.14. The majority of directors on Chinese boards appear to be in their forties (39%) and fifties (39%).

X is a vector of control variables that includes four categories. First, variables on board characteristics include the natural logarithm of board size (*Board Size*), which is found to have a significant effect on bank performance (Adams & Mehran, 2012; Staikouras, Staikouras, & Agoraki, 2007), the percentage of independent directors (*Independent Directors*) who may have strong incentives to scrutinize the management (Adams & Mehran, 2012; Erkens, Hung, & Matos, 2012), and a dummy variable (*Duality*) that equals one if the chief executive officer (CEO) is also the chairman. As for the board diversity, previous studies suggest that the gender and nationality diversities both pose significant effects on firm performance (García-Meca et al., 2015; Liu, Wei, & Xie, 2014; Sila, Gonzalez, & Hagendorff, 2016), so the percentage of foreign directors (*Foreign Directors*) and the percentage of female directors (*Female Directors*) are also controlled in our study.

Second, the ownership variables control for both the type and level of the ownership structure (Liang et al., 2013). We include the proportion of shares owned by the largest shareholder if the largest shareholder is the government or state-owned enterprises (*State*), a foreign investor (*Foreign*), or a private investor (*Private*).

Some additional variables to capture bank-specific characteristics (Berger et al., 2009; Dong et al., 2014; García-Meca et al., 2015; Liang et al., 2013; Lin & Zhang, 2009) are also included. Bank size is measured by the natural logarithm of total assets (*Size*). The capital ratio is measured as total equity to total assets (*Capital Ratio*), reflecting the bank capitalization. We also calculate the loan ratio as total loans to total assets (*Loan Ratio*), which is related to the banks' credit. A dummy

⁹ That is the probability ($-ROA < E/A$), where E/A is the capital to assets ratio (equity/assets).

¹⁰ Alternative measures of age diversity are the Blau Index (*Blau*) and log of the standard deviation of board age (*LnSD*). In our study, these three measures (CV, *Blau* and *LnSD*) are significantly correlated at 0.7 or above.

Table 1
Summary statistics.

Variables	Mean	Std	P25	P50	P75	N
Panel A: Bank performance						
ROA	0.01	0.00	0.01	0.01	0.01	448
ROE	0.19	0.07	0.15	0.18	0.22	448
Z-score	3.88	0.72	3.37	3.81	4.31	447
NPLratio	0.01	0.01	0.01	0.01	0.01	435
Net Interest Margin	0.02	0.02	0.02	0.03	0.03	433
Pre-Provision Profit Ratio	−0.01	0.00	−0.01	−0.01	−0.00	397
Panel B: Bank board age diversity						
Age diversity (CV)	0.14	0.04	0.11	0.14	0.17	450
Age diversity (LnSD)	1.94	0.29	1.80	1.94	2.15	450
Age diversity (Blau)	0.58	0.11	0.52	0.60	0.65	450
Panel C: Bank board value diversity						
Value diversity (risk)	0.09	0.03	0.07	0.09	0.11	302
Value diversity (prudence)	0.05	0.02	0.04	0.04	0.06	302
Value diversity (wealth)	0.12	0.04	0.09	0.11	0.14	302
Value diversity (success)	0.03	0.02	0.02	0.02	0.03	302
Value diversity (creativity)	0.03	0.02	0.02	0.03	0.04	302
Value diversity (slackness)	0.37	0.15	0.30	0.36	0.44	302
Panel D: Control variables						
<i>Board Characteristics</i>						
Independent Directors	0.25	0.12	0.15	0.27	0.33	450
Board Size	13.77	3.37	11.00	14.00	15.00	450
Duality	0.04	0.19	0.00	0.00	0.00	450
Foreign Directors	0.02	0.05	0.00	0.00	0.00	450
Female Directors	0.11	0.10	0.00	0.09	0.17	450
<i>Ownership Characteristics</i>						
State	0.18	0.19	0.00	0.12	0.21	451
Foreign	0.02	0.06	0.00	0.00	0.00	451
Private	0.03	0.07	0.00	0.00	0.00	451
<i>Bank-Specific Measures</i>						
Capital Ratio	0.07	0.02	0.05	0.06	0.08	450
Loan Ratio	0.46	0.11	0.40	0.48	0.54	450
Size	18.81	1.67	17.70	18.44	19.55	450
Bank Age	2.50	0.77	1.95	2.64	2.83	450
Listed	0.18	0.39	0.00	0.00	0.00	451
<i>Location Effects</i>						
City GDP	10.98	0.50	10.63	11.07	11.38	454

Notes: This table reports descriptive statistics for main variables. The sample is an unbalanced panel covering 97 banks over the period from 2009 to 2013. Panel A reports the summary statistics of bank performance measures. Panel B reports the descriptive statistics for bank board age diversities. Panel C reports the summary statistics for board value diversities. Panel D reports the summary statistics for other control variables.

variable for listed banks (*Listed*) is equal to one if the bank is listed. We also include the natural logarithm of the number of years since the bank has been established (*Bank Age*) as banks with a long history tend to have a more mature operation system that is related to better performance.

Lastly, to account for the potential regional effects on bank performance, we follow previous studies (Ferri, 2009; Qian et al., 2015; Zhang, Wang, & Qu, 2012) and employ the natural logarithm of GDP per capita for the city (*City GDP*) where the bank's headquarters are located. To control for macroeconomic shocks, all of our regressions contain a full set of year dummies.

Panel D of Table 1 reports the summary statistics for the control variables. The average board size in Chinese banks is 13.77, which is comparable to that of 12.68 in the US (Pathan & Faff, 2013) and 12.79 in nine developed countries (García-Meca et al., 2015).¹¹ On average, 25.00% of directors in Chinese banks are independent directors. In our sample, only 4.00% of CEOs in Chinese banks have the duality position. In the ongoing process of privatization, only about 18.00% of the sample banks are listed on the stock exchange. On average, in our sample, around 18.00% of shares are owned by the largest shareholder

¹¹ Nine developed countries include Canada, France, Germany, Italy, the Netherlands, Spain, Sweden, the UK and the US.

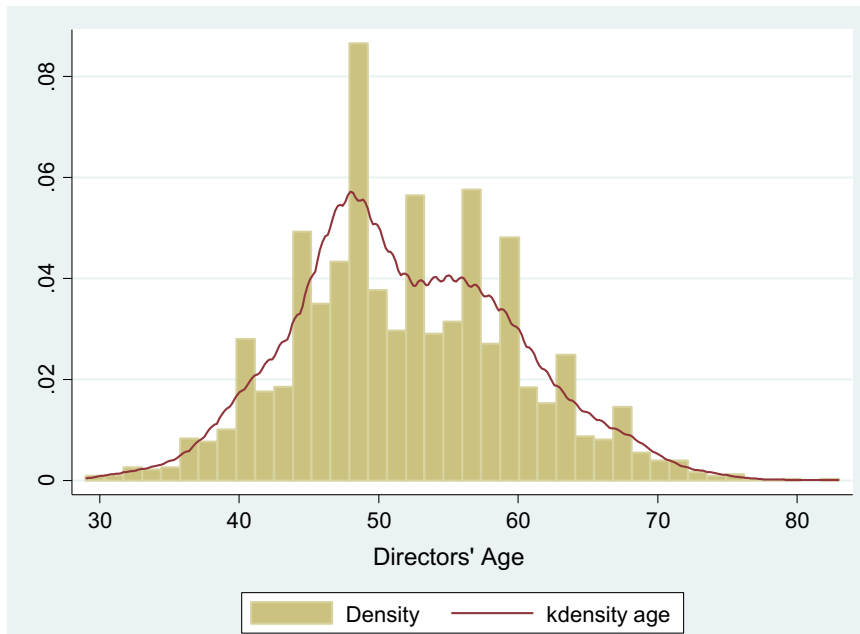


Fig. 1. Distribution of directors' age in Chinese banks from 2009 to 2013.

Source: Chinese bank annual report (2009, 2010, 2011, 2012 and 2013).

Notes: This figure reports the distribution of directors' age in Chinese banks.

if the largest shareholder is the government or a state-owned enterprise.

A correlation matrix of main variables used in Model (1) is presented in Table 2. Based on previous study (e.g., Liu et al., 2014), a correlation of 0.7 or higher in its absolute value indicates a multicollinearity issue. Table 2 shows that the highest correlation coefficient is 0.675 between ROA and ROE. Since these two variables are alternative measures for bank performance and are not used simultaneously in one model, the high correlation is not an issue. With respect to other variables, there is no evidence for multicollinearity.

5.2.2. Board value diversity

In order to explore the reasons why board age diversity affects bank performance, we introduce directors' personal values. As discussed before, directors' values are not directly observable but are assumed to be framed by their ages. To obtain the impact of value diversity on bank performance, we take four steps.

First, we extract 17 value indicators that are related with work and business from the China Values Survey (2012), namely, risk, work, happiness, prudence, wealth, success, thoroughness, pressure, outgoing, active, creativity, helping others, finding faults, reserved, life satisfaction, slackness, and tension.¹² Following Ahern, Daminelli, and Fracassi (2015), we rescale the responses to each question (each value indicator) into a binary variable, taking values of zero or one (See Appendix A.1). For example, for the value on risk, we assess whether the person is risk-taking by scaling answers "Very Much Like Me" and "Like Me" to be one and "Somewhat Like Me", "A Little Like Me", and "Not At All Like Me" to be zero.

Second, we apply a logit model to predict the parameters of each value specification based on the World Values Survey (China 2012). We follow previous economic and psychological literature on individuals' values and attitudes (e.g., Clark & Oswald, 1994; Dolan, Peasgood, & White, 2008; Frey & Stutzer, 2000; Shields, Price, & Wooden, 2009) and include available key demographic and socio-economic variables taken from the background information provided in the survey, including Age, Gender, Education, Employment, and Income.

The World Values Survey (China 2012) consists of the whole

population of Chinese respondents, while our sample is only comprised of bank directors. Income and Employment reveal the differences between directors in our sample and the individuals in the survey.¹³ Thus, we restrict the World Values Survey (China 2012) to a group of individuals who are employed at a high-income level. We employ propensity score matching analysis (See Appendix A.2) to identify individuals in this group who have similar characteristics with bank directors in this restricted group.¹⁴ Next, we predict the parameters of value specifications based on this subgroup of matched individuals.

The following logit model is used to predict personal values:

$$Pr(value_{ij} = 1) = F(\beta_0 + \beta_1 Age_j + \beta_2 Education_j + \beta_3 Gender_j + \varepsilon) \quad (2)$$

F is the cumulative standard logistic distribution. $value_{ij}$ equals one if the respondent j 's response to the question (value indicator i) is recorded as one. ε denotes the random error, and the values are all measured by the probability of holding this value. Independent variables in Model (2) include Age, Education, and Gender. Age is given in years. Education is specified as categorical variables and is divided into three groups: *university* (university or higher), *second school* (specialized secondary or vocational technical school), and *primary school* (primary school or less). Gender is indicated as one for males and zero for females.

After the estimation, we identify the value indicators that are significantly affected by age shown by β_1 and keep them for later analysis. It results in keeping only six out of seventeen value indicators, namely, risk, prudence, wealth, success, creativity, and slackness (see Panel B of Appendix B).

Third, we input bank directors' information in our sample including age, education level, and gender into Model (2) with the estimated parameters in the second step to predict six value indicators (risk, prudence, wealth, success, creativity, and slackness). Since some

¹² World Values Survey measures attitudes towards the environment, work, family, politics, national identity, culture, diversity, insecurity, and subjective well-beings. In the China Values Survey (2012), we focus on all value indicators that are related with work/business.

¹³ In the World Values Survey, individuals' income level is scaled across nine levels (1–9). We rescale them into three categories: low (1–3), middle (4–6) and high (7–9). Income is consolidated from nine categories into three categories: high (7–9), middle (4–6), and low (1–3). Employment is denoted as one for those in employment and zero otherwise. In our study, we assume all directors are employed and belong to the high-income level.

¹⁴ We present the detailed steps of propensity score matching in Appendix A.2. Matching balance checking is also reported in Table A2. Additionally, the differences in means of variables between the treated and control groups are not significant, and the percentage of reduced bias for all the covariates is less than 5%.

Table 2
Correlation matrix for main variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1 ROA	1.000																				
2 ROE	0.675	1.000																			
3 Z-score	0.072	-0.227	1.000																		
4 NPLratio	-0.284	-0.227	-0.156	1.000																	
5 Age Diversity	-0.096	-0.171	0.208	-0.090	1.000																
6 Board Size	-0.015	-0.011	0.242	-0.075	0.029	1.000															
7 Duality	-0.013	-0.039	0.030	0.015	-0.008	0.046	1.000														
8 Independent Directors	-0.020	-0.043	0.310	-0.092	0.165	0.327	-0.032	1.000													
9 Foreign Directors	-0.114	-0.010	0.212	-0.057	-0.131	0.262	-0.050	0.198	1.000												
10 Female Directors	0.029	0.024	0.033	-0.019	0.031	0.203	0.065	0.026	0.041	1.000											
11 State	-0.228	-0.114	-0.199	-0.091	-0.055	-0.106	-0.62	0.027	0.049	0.104	1.000										
12 Foreign	-0.099	-0.008	0.210	0.170	0.014	0.039	-0.062	0.172	0.468	-0.041	-0.302	1.000									
13 Private	0.069	0.060	0.015	-0.051	-0.002	0.061	-0.006	0.027	-0.031	-0.072	-0.365	-0.010	1.000								
14 Size	-0.095	0.096	0.240	-0.071	-0.250	0.530	-0.070	0.386	0.369	0.142	0.255	0.073	0.063	1.000							
15 Listed	-0.018	0.083	0.243	-0.060	-0.060	0.242	0.459	-0.091	0.345	0.203	0.063	0.166	-0.002	0.125	0.475	1.000					
16 Loan Ratio	0.188	-0.000	0.001	0.159	-0.160	0.169	-0.001	0.058	0.100	0.077	-0.231	0.083	0.093	0.093	0.040	0.147	1.000				
17 Capital Ratio	0.180	-0.376	0.235	-0.054	0.180	-0.035	0.027	0.078	-0.150	0.027	-0.133	-0.100	0.078	-0.269	-0.145	0.097	1.000				
18 City GDP	-0.096	-0.156	0.198	-0.017	-0.060	0.241	-0.167	0.321	0.210	0.023	0.115	0.113	0.081	0.472	0.300	0.097	0.097	1.000			
19 Bank Age	0.001	0.104	0.095	0.120	-0.297	0.264	0.059	0.120	0.258	0.045	0.113	0.092	0.026	0.501	0.447	0.209	-0.194	0.256	1.000		
20 Net Interest Margin	0.058	-0.035	-0.011	0.024	-0.041	-0.064	0.500	-0.070	0.039	-0.126	-0.156	-0.055	0.138	-0.174	-0.092	0.055	0.089	-0.243	0.018	1.000	
21 Pre-provision Profit	-0.011	0.181	-0.074	-0.075	-0.72	0.064	0.043	0.096	0.014	0.016	0.251	-0.068	-0.019	0.242	0.152	-0.314	-0.121	0.164	0.267	-0.021	1.000

Notes: This table shows the correlation matrix of main variables. ROA is net income to total assets. ROE is net income to total equity. Z-score is measured by the return on assets plus the equity to assets ratio divided by the standard deviation of the return on assets. NPLratio is non-performing loans divided by total loans. Age Diversity is measured by coefficient of variation of board age (CV). Board Size is the natural log of board size. The dummy variable Duality is equal to one if the bank governor is also the chairman of the board, and zero otherwise. Independent Directors is the percentage of independent directors. Foreign Directors is the percentage of foreign directors. Female Directors is the percentage of female directors. State is the percentage of shares held by the largest shareholders if the largest shareholder is the government or a state-owned enterprise. Foreign is the percentage of shares held by the largest shareholders if the largest shareholder is a foreign investor. Private is the percentage of shares held by the largest shareholders if the largest shareholder is a private investor. Size is the natural log of total assets. Bank Age is the natural log of bank's age. The dummy Listed equals to one if the bank is listed, and zero otherwise. City GDP is the natural log of GDP per capita of the city in which the bank's headquarters is located. Net Interest Margin is measured by net interest income divided by total earning assets. The Pre-Provision Profit ratio is calculated as the difference between operating income and operating expense to total assets.

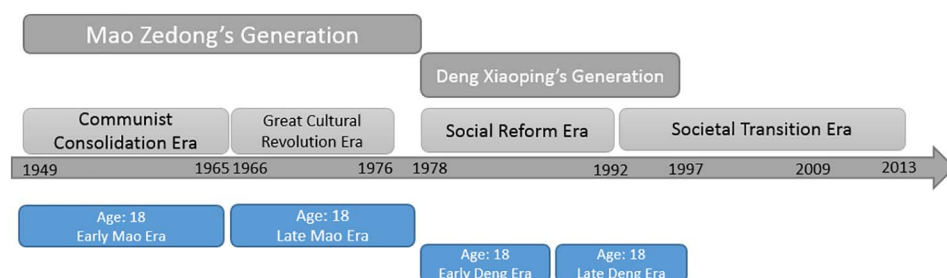


Fig. 2. Generation timeline in China.

Notes: This figure shows the generation timeline in China. Mao's era covers Communist Consolidation (1949–1965) and Great Cultural Revolution (1966–1976), while Deng Xiaoping initiated the Social Reform Era (1978–1992) and part of the Societal Transition Era (1993–now) (Egri & Ralston, 2004; Ralston et al., 1999; Sun & Wang, 2010). Since social events at the age of 18 are far more influential than those that occur at an older age (Ghitza & Gelman, 2014), we divided different sub-generations based on the age of 18.

foreign directors have stayed in China for a long time, they are likely to be influenced by the Chinese culture and lifestyle. Then, we predict the values of the foreign directors, which account for less than 2% in our whole sample, using the World Values Survey (China 2012), as they are more likely to absorb the Chinese culture.¹⁵

In the last step, we employ the following model, which is similar to Model (1), to examine the impacts of these value diversities on bank performance:

$$\text{Bank Performance}_{i,t} = \alpha + \beta \text{Board Value Diversity}_{i,t-1} + X_{i,t-1}\delta + \theta_t + \mu_i + \varepsilon_{i,t} \quad (3)$$

Board Value Diversity includes six value diversities that are calculated by the coefficient of variation of each value indicator. From Panel C of Table 1, we find that values on risk, wealth, and slackness have higher coefficients of variation (0.09, 0.12, 0.37, respectively) compared with the rest of the value indicators. Furthermore, if the β in Model (3) is in the same sign (positive or negative) as β in Model (1), we can then conclude that age is one of the strongest predictors of value, and age diversity can affect bank performance via the variations in directors' values.

6. Empirical results

6.1. Does age diversity affect bank performance?

We first examine whether the age diversity affects bank performance. Table 2 shows the results of Model (1) with bank profitability and bank risk presented in columns (1)–(2) and (3)–(4), respectively. Consistent with H1b, age diversity has a significant and negative impact on bank profitability. Specifically, a two-standard-deviation increase in age diversity (CV) shrinks *ROA* by 12.80% and *ROE* by 12.75%, which is comparable with Hagendorff and Keasey's (2012) study on banks and the strand of literature in non-bank samples (Ali et al., 2014; Murray, 1989; Tarus & Aime, 2014).

The results are in line with the argument based on social psychology theories that age diversity lessens the cohesion in the boardroom and leads to barriers such as difficult communications, and generates conflicts (Pelled, Eisenhardt, & Xin, 1999; Westphal & Bednar, 2005; Williams & O'Reilly, 1998). Such conflicts can protract the decision-making process and weaken the effectiveness of the board. When the effects of conflicts in board communication, cooperation, and decision-making processes outweigh the benefits of providing comprehensive perspectives and different external information by directors at different ages, the role of the board as a monitor and advisor will be impeded. As a result, an insufficient board may subsequently weaken the bank's profitability. However, in terms of risk, we do not find any significant relationship between age diversity and bank risk.

With respect to other board characteristics, *Duality* has a significantly negative relationship with *ROA* (significance at the 10% level) and a strong positive impact on *NPLratio* (significance at the 5%

level), which indicates that banks with a CEO duality position perform worse. In terms of board independence, the coefficient of *Independent Directors* is significantly positive on bank profitability and negative on bank credit risk, which is consistent with previous studies (García-Meca et al., 2015; Liang et al., 2013). This relationship suggests that independent directors are beneficial to Chinese banks. With regard to other bank characteristics, *Private* ownership harms bank performance measured by *ROA*, while larger *Bank Size* weakens bank performance by decreasing *ROE* and augmenting non-performing loans. We also find that bank's *Capital Ratio* is negatively related with *ROE* and positively related with *Z-score* (both at the significance level of 1%), indicating that banks with a higher degree of capitalization have lower insolvency risk.

6.2. Age and values

Generational gaps are often caused by differences in values (Prasad, 1992). It appears that there is no consensus about how to define generations in China. Studies generally reach an agreement that each generation comes into existence with a particular social movement with a shared experience (Sun & Wang, 2010) and that most of an individual's values become entrenched in one's late-teens (Ralston et al., 1999). Based on this framework of value formation, in our study, we define our generation as two main groups that correspond to specific social and political events at the age of 18: Mao's generation (born during 1931–1958) and Deng's generation (born during 1959–1990) (See Fig. 2).

According to some specific social events, we further divide the Mao generation into the early Mao generation (born during 1931–1947) who experienced the Communist Consolidation period and the late Mao generation (born during 1948–1958) who underwent the Great Cultural Revolution. Similarly, we decompose the Deng generation into the early Deng generation (born during 1959–1974) who experienced the Social Economic Reform and the late Deng generation (born during 1975–1990) who are in the societal transition period (Egri & Ralston, 2004; Ralston et al., 1999; Sun & Wang, 2010).

Our value analysis first focuses on the logit regression of 17 value indicators based on the matched subgroup in the World Values Survey (China 2012). Table 4 shows the predicted parameters of different values. Six value indicators (i.e., risk, prudence, wealth, success, creativity, slackness) are significantly affected by age.

Fig. 3 shows the changes of these six values (average probability of holding this value) among directors in our sample. Our results confirm the previous argument that individuals' values change across age cohorts in China (Egri & Ralston, 2004; Sun & Wang, 2010). More specifically, directors' values on risk, prudence, and wealth vary widely across generations. Compared to directors from the early Mao generation, directors from the late Deng generation are more creative, have greater risk appetite, appreciate wealth more, and pursue profit maximization, which is consistent with previous propositions by Huang et al. (2015) and Sun and Wang (2010). In terms of work ethics, younger directors born in the late Deng generation in China enjoy the feeling of being successful and yearn for achievement recognition, but they are less prudent and cautious than the older ones.

¹⁵ In the robustness test, we predict directors' values partially based on their own countries' value survey.

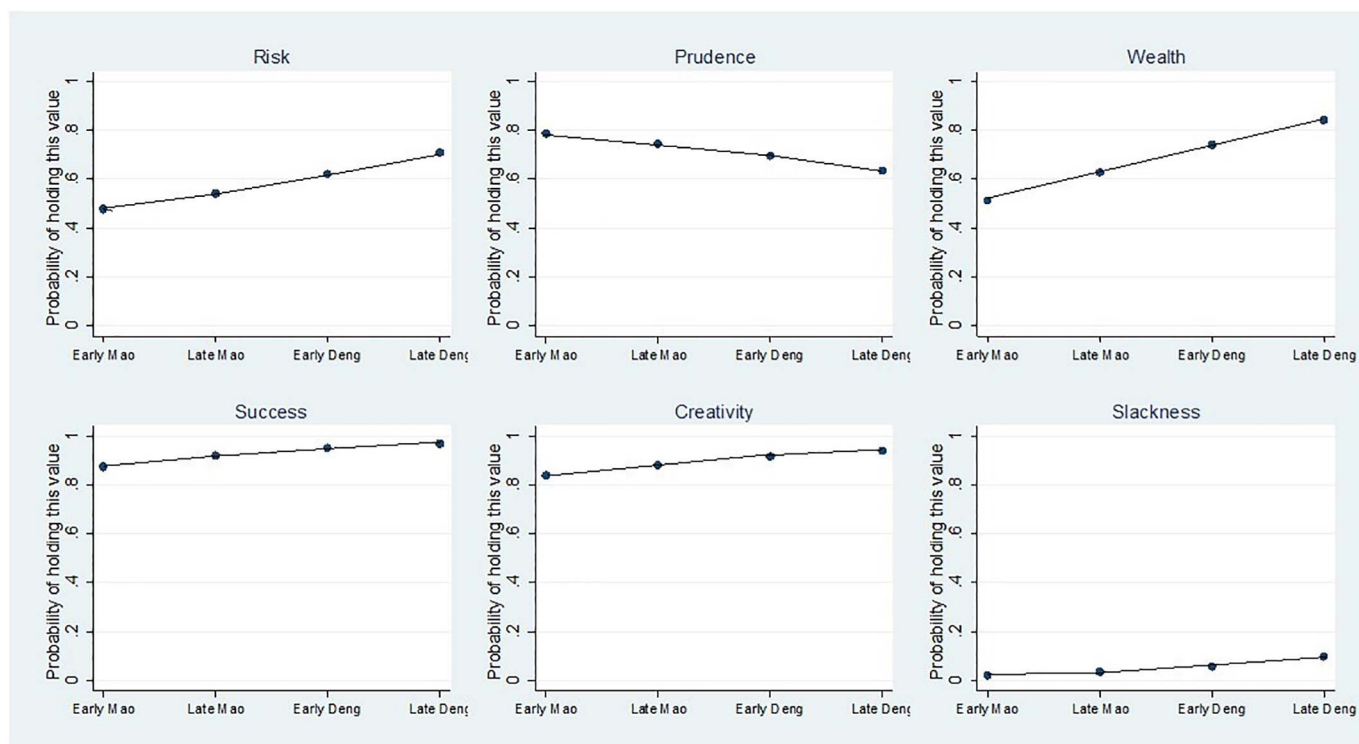


Fig. 3. Personal value differences among directors in Chinese banks from 2009 to 2013.

Source: Chinese bank annual report (2009, 2010, 2011, 2012, and 2013), World Values Survey 6th Wave.

Notes: Panels A to H show directors' personal value (mean) changes across different age groups. We define our generation groups that correspond to specific social and political events at the age of 18: the early Mao generation (born during 1931–1947), the late Mao generation (born during 1948–1958), the early Deng generation (born during 1959–1974), and the late Deng generation (born during 1975–1990).

6.3. Why does age diversity affect bank performance?

In order to further investigate the negative relationship between age diversity and bank performance, we decompose age diversity into value diversity and test whether diversity in different values influences bank performance. Similar to age diversity, the results presented in Table 5 show that the heterogeneity of directors' views in some cases poses a negative impact on bank profitability, which supports H2b.

The coefficients of directors' diverse views on risk, prudence, and wealth impose negative impacts on bank profitability,¹⁶ while variations in directors' values on creativity and slackness do not affect bank profitability. An increase of two standard deviations in value diversity on risk is associated with a decrease in ROA of 16.80% and in ROE of 18.44%. With regard to prudence, increases of two standard deviations exert negative impacts on ROA and ROE of 20.40% and 19.68%, respectively. Furthermore, increases of two standard deviations in directors' value diversity of wealth reduce banks' ROA by 15.20% and ROE by 16.71%. Additionally, we observe that the coefficients of directors' diverse values on success affect ROE negatively at the 5% level. These results suggest that value diversity can trigger intragroup conflicts in the workforce and cause a negative impact on performance.

As shown in Fig. 3, directors' values change with different levels across the four generations of Chinese bank directors. Compared with older directors, those bank directors growing up in Deng's era have a greater appetite of risk and pursue profit maximization. We also find that directors growing up in Mao's era are more cautious and they value wealth less. Taken together, the differences in directors' personal values on risk, prudence, and wealth across generations are more likely to

weaken the interpersonal relations between groups and may spark intragroup conflicts in the decision making process. As a result, this conflict prevents the board from functioning effectively, which ultimately harms bank performance. In summary, taking together the results shown in Tables 3, 4, and 5, the effect of value diversity has the same sign with that of age diversity on bank profitability. Thus, we conclude that age diversity may affect bank profitability negatively via their diverse values.

With respect to bank risk, Table 5 illustrates that directors' diverse values fail to have any significant effects on the *Z-score* or *NPLratio*, indicating that the variability of directors' views is unrelated with bank risk.

7. Robustness

7.1. Potential endogeneity concern

A key concern for analyses of board effects on firm performance is the endogeneity (Hermalin & Weisbach, 2003). The relationship between board age diversity and performance may be biased because of the possible correlation between independent variables and the error term. On one side, board age diversity generates conflicts among the directors and harms bank performance; on the other side, banks that perform worse may appoint an older director who is more experienced, which may change the board age diversity. We partially address this reverse causality issue by employing one-year lagged board characteristics in our previous analysis.

In this section, we employ a fixed effect instrumental variable approach using Lewbel's (2012) method, which includes internal and external instrumental variables. Following previous studies (e.g., Anderson, Reeb, Upadhyay, & Zhao, 2011; Liu et al., 2014), board diversity in a firm may be affected by the diversity in the same industry (size) or the diversity of local population. Therefore, our external

¹⁶ As directors' values are imputed, we have also modified our approach by using bootstrapped standard errors. The results are reported in Appendix C.5; they are quantitatively similar to the estimates in Table 4.

Table 3
Board age diversity and bank performance.

	Profitability		Risk	
	ROA	ROE	Z-score	NPLratio
	(1)	(2)	(3)	(4)
Age Diversity	− 0.016** (0.007)	− 0.303** (0.129)	− 0.092 (0.449)	0.037 (0.037)
Board Size	0.000 (0.000)	0.001 (0.001)	− 0.001 (0.003)	− 0.000 (0.000)
Duality	− 0.002* (0.001)	− 0.021 (0.018)	0.096 (0.086)	0.005** (0.002)
Independent Directors	0.005* (0.003)	0.078 (0.055)	0.268* (0.160)	− 0.028** (0.012)
Foreign Directors	− 0.008* (0.004)	− 0.177** (0.079)	0.630** (0.309)	0.031* (0.018)
Female Directors	0.001 (0.002)	0.021 (0.058)	0.004 (0.143)	− 0.002 (0.008)
State	0.009 (0.006)	0.178 (0.114)	0.191 (0.340)	− 0.041 (0.039)
Foreign	− 0.000 (0.008)	0.206 (0.151)	− 0.222 (0.467)	0.008 (0.034)
Private	− 0.010** (0.004)	− 0.097 (0.080)	0.017 (0.303)	0.050* (0.029)
Size	− 0.001 (0.001)	− 0.043* (0.024)	0.045 (0.080)	0.013* (0.007)
Listed	0.001 (0.001)	0.007 (0.015)	0.010 (0.054)	0.001 (0.005)
Loan Ratio	− 0.004 (0.004)	− 0.080 (0.071)	− 0.235 (0.255)	0.027 (0.020)
Capital Ratio	0.010 (0.010)	− 0.591*** (0.195)	2.719*** (0.651)	− 0.010 (0.039)
City GDP	− 0.002 (0.001)	− 0.024 (0.025)	− 0.036 (0.077)	0.001 (0.004)
Bank Age	− 0.000 (0.002)	0.012 (0.030)	0.030 (0.080)	0.013** (0.007)
Year Controls	Yes	Yes	Yes	Yes
N	349	349	349	342
R ²	0.230	0.180	0.202	0.199

Notes: The table presents the regression results for the effects of age diversity on bank performance (bank profitability and risk). The result of bank profitability measured by ROA and ROE are presented in columns (1) and (2). The results of bank risk measured by Z-score and NPLratio are presented in columns (3) and (4). Age Diversity is measured by coefficient of variation of board age (CV). Board Size is the natural log of board size. The dummy variable Duality is equal to one if the bank governor is also the chairman of the board, and zero otherwise. Independent Directors is the percentage of independent directors. Foreign Directors is the percentage of foreign directors. Female Directors is the percentage of female directors. State is the percentage of shares held by the largest shareholders if the largest shareholder is the government or a state-owned enterprise. Foreign is the percentage of shares held by the largest shareholders if the largest shareholder is a foreign investor. Private is the percentage of shares held by the largest shareholders if the largest shareholder is a private investor. Size is the natural log of total assets. Bank Age is the natural log of bank's age. The dummy Listed equals one if the bank is listed, and zero otherwise. City GDP is the natural log of GDP per capita of the city in which the bank's headquarters is located. It employs the panel fixed effect estimator with lagged independent variables. Constant is included into the estimation but not reported. The robust error of each coefficient is shown in parentheses. *, **, *** indicate statistical significance level at 10%, 5%, and 1%, respectively.

instrumental variables are the median value of board age diversity for the banks in the same size quartile (Age Diversity Size)¹⁷ and the age diversity of the local population at the province level (Age Diversity Province).¹⁸ The economic rationale for using local population age

¹⁷ Previous studies usually use the median value of board diversity for the firm in the same industry and the same size quantile as the firm. However, our study only focuses on one industry (banking), so we use the median value of board age diversity for the banks in the same size group. When calculating Age Diversity Size, we exclude that specific bank and only focus on the other banks in the same size group.

¹⁸ We calculate the age diversity of the local population at the province level where the headquarter of the bank is located. Additionally, the provincial level data are collected from the China Statistical Yearbook.

diversity is that directors typically come from a firm's local geographic area and that greater local population age diversity provides a larger and more age-diverse pool to source directors.

Table 6 presents the results from estimating the fixed effect Model (1) using the instrumental variable approach. The LR statistics and Hansen J statistics both show that our external instruments satisfy the relevance and validity criterion in all specifications. Table 6 reports consistent findings with Table 3. In the first two specifications of bank profitability, the coefficients of the board age diversity are negative and significant, which indicates that our main results in Model (1) are robust.

In board composition research, dynamic endogeneity is also a major issue. Wintoki, Linck, and Netter (2012) argue that most of the existing studies on board structure neglect the fact that current board structure might be an outcome of past firm performance. Current firm performance may affect future board composition, and these, in turn, may affect future firm performance. In our study, shareholders may call for changes to the board. Replacing a younger director with an older one could change the age distribution on the board and, ultimately, affect bank performance. Thus, previous bank performance can affect the motivation of boards to hire new directors.

As a possible solution, following previous studies (Goergen et al., 2015; Liu et al., 2014; Wintoki et al., 2012), our empirical analysis is extended to employ the Arellano and Bond (1991) dynamic Generalized Method of Moments (GMM) estimator, which accounts for unobserved heterogeneity as well as the dynamic relation between board structure and past firm performance. We report the results of GMM regressions in Table 7. All of the independent variables are assumed to be endogenous variables, except for the year dummies. The lags (t-3 and t-4) of dependent variables and endogenous variables, together with all of the lags of the exogenous variables, are instrumental variables. In Table 7, we still find significant negative effects (at the 5% level) of board age diversity on bank profitability. Therefore, our main results in Model (1) are robust and are not driven by endogeneity.

7.2. Additional robustness tests

When examining the relationship between age diversity and bank performance in Model (1), we use the log of the standard deviation of board age (LnSD) and the Blau index of board age diversity (Blau) as alternative measures of age diversity. We find a consistently negative relation between age diversity and bank profitability (shown in Appendix C.1 and C.2). Additionally, we also followed existing studies (Bonin, Hasan, & Wachtel, 2005; Liang et al., 2013) to use Net Interest Margin and Pre-Provision Profit Ratio as alternative measures of bank profitability. We obtain a negative effect of age diversity on bank profitability, which is consistent with previous findings (See Appendix C.3).

Further, we conduct an alternative approach to predict directors' values. We construct a restricted group of individuals (employed and high income) in the World Values Survey (China 2012) and then conduct the propensity score matching analysis. As a robust test, we predict directors' values only based on this restricted group rather than the subgroup of matched individuals. Additionally, some may argue that foreign directors' values are affected not only by their own country but also by China. Thus, we calculate foreign directors' values based on the China survey and their own country survey with equal weights as a robustness check in Appendix C.4. The results are similar to our previous findings in Table 4.

We also find negative relations between directors' value diversities on risk, prudence, wealth, and success at one side and bank profitability at the other side. By focusing on a different subgroup (i.e., those employed and with high income), we also find that directors' diverse views with respect to slackness has a negative effect on ROA. The results confirm the results from our previous analysis that directors' value diversities have a negative impact on bank profitability.

Table 4
Prediction of values from the World Values Survey (China).

Panel A	Value (risk)	Value (work)	Value (happiness)	Value (prudence)	Value (wealth)	Value (success)	Value (thoroughness)	Value (pressure)
Age	− 0.030*** (0.011)	− 0.029 (0.021)	0.032 (0.020)	0.022* (0.012)	− 0.051*** (0.015)	− 0.043** (0.018)	− 0.014 (0.014)	− 0.011 (0.012)
Education								
2(secondary school)	0.130 (0.315)	0.711 (0.492)	0.542 (0.582)	0.007 (0.385)	− 0.211 (0.419)	− 0.075 (0.482)	0.185 (0.383)	0.106 (0.364)
3(university)	0.293 (0.355)	0.466 (0.522)	1.267* (0.667)	− 0.516 (0.399)	− 0.772* (0.453)	0.923 (0.698)	0.957** (0.432)	0.015 (0.398)
Gender	0.065 (0.222)	0.365 (0.363)	− 0.543 (0.423)	0.007 (0.245)	0.253 (0.286)	− 0.212 (0.395)	0.002 (0.271)	0.156 (0.235)
N	374	389	393	373	375	375	320	319
R ²	0.029	0.034	0.018	0.025	0.048	0.045	0.030	0.004

Panel B	Value (active)	Value (creativity)	Value (helping other)	Value (finding faults)	Value (reserved)	Value (life satisfaction)	Value (slackness)	Value (nervous)	Value (outgoing)
Age	− 0.015 (0.012)	− 0.033** (0.015)	− 0.038 (0.037)	0.000 (0.013)	− 0.010 (0.013)	− 0.002 (0.012)	− 0.050** (0.021)	− 0.010 (0.014)	− 0.018 (0.012)
Education									
2(secondary school)	0.098 (0.368)	0.325 (0.374)	0.506 (0.917)	0.820* (0.427)	0.495 (0.386)	− 0.341 (0.366)	− 0.989** (0.494)	− 0.372 (0.376)	0.482 (0.361)
3(university)	0.748* (0.403)	1.141** (0.502)	0.000 (0.000)	0.853* (0.458)	0.767* (0.422)	0.179 (0.404)	− 1.760*** (0.583)	− 0.541 (0.419)	0.402 (0.397)
Gender	0.274 (0.239)	0.345 (0.293)	0.832 (0.843)	0.319 (0.250)	− 0.515** (0.240)	− 0.094 (0.243)	0.508 (0.377)	− 0.232 (0.254)	0.245 (0.236)
N	308	375	259	311	314	390	328	318	321
R ²	0.030	0.065	0.056	0.018	0.023	0.009	0.054	0.008	0.024

Notes: This table presents the results of prediction of seventeen values drawn from the World Values Survey (China). *Age* is given in years. *Education* is specified as categorical variables, divided into three groups: university (university or higher), second school (specialized secondary or vocational technical school), and primary school (primary school or less). *Gender* is indicated as zero for females and one for males. It employs a logit model with robust standard errors. Constant is included into the estimation but not reported. The robust error of each coefficient is shown in parentheses. *, **, *** indicate statistical significance level at 10%, 5%, and 1%, respectively.

Table 5
Board value diversity and bank performance.

	Value diversity (risk)	Value diversity (prudence)	Value diversity (wealth)	Value diversity (success)	Value diversity (creativity)	Value diversity (slackness)
Panel A: Dependent variable is ROA						
ROA	− 0.028** (0.013)	− 0.051** (0.024)	− 0.019** (0.009)	− 0.051 (0.033)	− 0.029 (0.025)	− 0.003 (0.002)
Year Controls	Yes	Yes	Yes	Yes	Yes	Yes
N	239	239	239	239	239	239
R ²	0.307	0.302	0.302	0.290	0.280	0.279
Panel B: Dependent variable is ROE						
ROE	− 0.584** (0.251)	− 0.935** (0.463)	− 0.397** (0.185)	− 1.224** (0.610)	− 0.798 (0.603)	− 0.092 (0.057)
Year Controls	Yes	Yes	Yes	Yes	Yes	Yes
N	239	239	239	239	239	239
R ²	0.303	0.290	0.296	0.289	0.276	0.278
Panel C: Dependent variable is Z-score						
Z-score	− 0.312 (0.874)	− 0.022 (1.630)	− 0.283 (0.672)	0.419 (1.678)	− 0.459 (2.123)	0.057 (0.209)
Year Controls	Yes	Yes	Yes	Yes	Yes	Yes
N	239	239	239	239	239	239
R ²	0.176	0.175	0.177	0.176	0.176	0.176
Panel D: Dependent variable is NPLratio						
NPLratio	− 0.312 (0.874)	− 0.022 (1.630)	− 0.283 (0.672)	0.419 (1.678)	− 0.459 (2.123)	0.057 (0.209)
Year Controls	Yes	Yes	Yes	Yes	Yes	Yes
N	239	239	239	239	239	239
R ²	0.176	0.175	0.177	0.176	0.176	0.176

Notes: This table presents the results for the effects of value diversity on bank performance. Panel A presents results for regressing ROA on various value diversities. Panel B presents results for regressing ROE on various value diversities. Panel C presents results for regressing Z-score on various value diversities. Panel D presents results for regressing NPLratio on various value diversities. For the sake of saving space, the estimation results for control variables are omitted here. Constant is included into the estimation but not reported. The robust error of each coefficient is shown in parentheses. *, **, *** indicate statistical significance level at 10%, 5%, and 1%, respectively.

Table 6
Fixed effect instrumental variable approach: board age diversity and bank performance.

	Profitability		Risk	
	ROA	ROE	Z-score	NPLratio
	(1)	(2)	(3)	(4)
Age diversity	− 0.039** (0.018)	− 0.474* (0.286)	0.407 (1.056)	0.106 (0.089)
Board Size	0.000** (0.000)	0.001 (0.001)	− 0.001 (0.004)	− 0.000 (0.000)
Duality	− 0.003** (0.001)	− 0.023 (0.016)	0.091 (0.078)	0.005** (0.002)
Independent Directors	0.006*** (0.002)	0.074* (0.044)	0.316* (0.161)	− 0.029** (0.012)
Foreign Directors	− 0.012** (0.006)	− 0.206** (0.082)	0.637* (0.375)	0.043* (0.025)
Female Directors	0.001 (0.002)	0.032 (0.049)	− 0.000 (0.160)	− 0.003 (0.010)
State	0.007 (0.005)	0.161 (0.113)	0.117 (0.396)	− 0.037 (0.032)
Foreign	− 0.002 (0.008)	0.197 (0.143)	− 0.295 (0.492)	0.012 (0.033)
Private	− 0.011** (0.005)	− 0.097 (0.091)	0.003 (0.314)	0.053** (0.025)
Size	− 0.001 (0.001)	− 0.042** (0.019)	− 0.008 (0.077)	0.014*** (0.005)
Listed	− 0.000 (0.001)	0.004 (0.018)	0.008 (0.073)	0.003 (0.005)
Loan Ratio	− 0.005* (0.003)	− 0.063 (0.058)	− 0.275 (0.260)	0.029* (0.017)
Capital Ratio	0.010 (0.011)	− 0.805*** (0.225)	1.752** (0.866)	− 0.007 (0.045)
City GDP	− 0.001 (0.001)	− 0.023 (0.023)	− 0.025 (0.082)	− 0.000 (0.004)
Bank Age	− 0.000 (0.001)	0.014 (0.023)	− 0.028 (0.084)	0.013** (0.006)
Year Controls	Yes	Yes	Yes	Yes
N	345	345	345	340
LR	0.000	0.000	0.000	0.000
Hansen	0.536	0.506	0.516	0.877

Notes: This table presents the results of the fixed effect instrumental variable estimation using Lewbel's (2012) method. The result of bank profitability measured by ROA and ROE are presented in columns (1) and (2). The results of bank risk measured by Z-score and NPLratio are presented in columns (3) and (4). Age Diversity is measured by coefficient of variation of board age (CV). Board Size is the natural log of board size. The dummy variable Duality is equal to one if the bank governor is also the chairman of the board, and zero otherwise. Independent Directors is the percentage of independent directors. Foreign Directors is the percentage of foreign directors. Female Directors is the percentage of female directors. State is the percentage of shares held by the largest shareholders if the largest shareholder is the government or a state-owned enterprise. Foreign is the percentage of shares held by the largest shareholders if the largest shareholder is a foreign investor. Private is the percentage of shares held by the largest shareholders if the largest shareholder is a private investor. Size is the natural log of total assets. Bank Age is the natural log of bank's age. The dummy Listed equals one if the bank is listed, and zero otherwise. City GDP is the natural log of GDP per capita of the city in which the bank's headquarters is located. The external instrumental variables are the median value of board age diversity for the bank in the same size quartile and the age diversity of the local population at the province level. LR statistics is the test for under-identification. Hansen test statistics is the test of over-identifying restrictions based on the null that instruments are valid. Constant is included into the estimation but not reported. The robust error of each coefficient is shown in parentheses. *, **, *** indicate statistical significance level at 10%, 5% and 1%, respectively.

8. Conclusion

This paper extends the existing literature on board diversity by providing the first empirical evidence regarding the effect of board age diversity on bank performance in China. Our results show that age diversity in Chinese banks has a significant and negative influence on bank profitability. Although previous studies based on resource dependence theory argue that a more diverse board provides more external resources and enhances firm performance, our study suggests

Table 7
System GMM estimations: board age diversity and bank performance.

	Profitability		Risk	
	ROA	ROE	Z-score	NPLratio
	(1)	(2)	(3)	(4)
Lagged ROA	0.726*** (0.174)			
Lagged ROE		0.840*** (0.172)		
Lagged Z-score			0.901*** (0.101)	
Lagged NPLratio				0.330** (0.142)
Age diversity	− 0.037 (0.028)	− 0.726** (0.366)	0.582 (1.720)	0.059 (0.095)
Board Size	0.000 (0.000)	0.002 (0.005)	− 0.003 (0.018)	− 0.001 (0.001)
Duality	0.000 (0.006)	0.033 (0.086)	0.040 (0.285)	− 0.013 (0.033)
Independent Directors	0.003 (0.010)	− 0.047 (0.111)	− 0.027 (0.540)	− 0.040* (0.024)
Foreign Directors	0.006 (0.005)	0.043 (0.067)	0.015 (0.365)	− 0.016 (0.019)
Female Directors	0.015 (0.017)	0.213 (0.373)	0.314 (1.169)	0.044 (0.097)
State	0.027* (0.015)	0.285 (0.226)	1.329 (1.197)	− 0.083* (0.043)
Foreign	0.005 (0.005)	0.056 (0.077)	0.497* (0.279)	0.001 (0.031)
Private	0.000 (0.001)	− 0.004 (0.012)	0.153* (0.082)	0.004 (0.003)
Size	0.000 (0.003)	0.013 (0.027)	− 0.141 (0.182)	− 0.007 (0.014)
Listed	− 0.001 (0.006)	0.003 (0.074)	0.025 (0.380)	− 0.002 (0.018)
Loan Ratio	0.001 (0.006)	0.136 (0.088)	− 0.118 (0.314)	0.002 (0.019)
Capital Ratio	0.016 (0.076)	− 1.525 (0.999)	5.630 (4.839)	0.133 (0.178)
City GDP	− 0.003 (0.003)	− 0.025 (0.036)	− 0.234 (0.164)	− 0.001 (0.009)
Bank Age	− 0.002* (0.001)	− 0.038* (0.022)	− 0.127 (0.081)	0.000 (0.003)
Year Control	Yes	Yes	Yes	Yes
N	347	347	347	341
AR2 p-value	0.482	0.198	0.903	0.543
Hansen p-value	0.488	0.970	0.859	0.998

Notes: This table presents the results of the two-step system GMM estimation. The results of bank profitability measured by ROA and ROE are presented in columns (1) and (2). The results of bank risk measured by Z-score and NPLratio are presented in columns (3) and (4). Age Diversity is measured by coefficient of variation of board age (CV). Board Size is the natural log of board size. The dummy variable Duality is equal to one if the bank governor is also the chairman of the board, and zero otherwise. Independent Directors is the percentage of independent directors. Foreign Directors is the percentage of foreign directors. Female Directors is the percentage of female directors. State is the percentage of shares held by the largest shareholders if the largest shareholder is the government or a state-owned enterprise. Foreign is the percentage of shares held by the largest shareholders if the largest shareholder is a foreign investor. Private is the percentage of shares held by the largest shareholders if the largest shareholder is a private investor. Size is the natural log of total assets. Bank Age is the natural log of bank's age. The dummy Listed equals one if the bank is listed, and zero otherwise. City GDP is the natural log of GDP per capita of the city in which the bank's headquarters is located. AR2 is test for second order serial correlation in the first differenced residuals under the null of no serial correlation. Hansen test statistics is the test of over-identifying restrictions based on the null that instruments are valid. Constant is included into the estimation but not reported. The robust error of each coefficient is shown in parentheses. *, **, *** indicate statistical significance level at 10%, 5% and 1%, respectively.

that age diversity is not beneficial to Chinese banks. That is, age-diverse boards are more likely to suffer from communication barriers and generate interpersonal frictions and conflicts in the boardroom; ultimately, they may harm bank performance.

To examine why age diversity negatively affects bank performance, we further decompose directors' age diversity into their personal value diversities. Given the immense transition in China over the past decades, directors that grew up in Mao's and Deng's eras experienced different historical events and cultural phenomena, which in turn affected their formulation of values and cognitive abilities. We find that the heterogeneity of directors' views with respect to risk, prudence, and wealth negatively affects bank profitability. In other words, directors with diverse values on risk, prudence and wealth may approach decisions differently (i.e., they are more likely to slow down the decision process in the boardroom and create more conflicts), leading to worse bank performance. Thus, we conclude that the ultimate success of the board depends not only directors' resources but also the interactions between them.

Our findings provide useful guidance for regulators, policymakers, and bank directors concerning board diversity and shed light on the

direction of further banking governance reform. In particular, our findings suggest that, in the current weak corporate governance system in China, an age-diverse board is not beneficial for banks. Banks with weak governance should look into adding directors with similar ages into their board, to lower the generation gap.

We believe that findings from this study are relevant not only for China but also for other transition countries that are transforming from a centrally planned economy to a market-based economy. For these countries, directors from different generations are more likely to hold heterogeneous values, as cultural change is an ingredient of economic development. To strive for excellence, the board should appreciate the diverse personal values among directors, learn to manage value differences, and utilize the benefits of directors' different personal values to improve the effectiveness of the board. Managing the difference among directors is likely to lead to a better understanding of optimal board composition.

Appendix A

A.1. Questions from the World Values Survey used to identify value indicators

Using this card, would you please indicate for each description whether that person is very much like you, like you, somewhat like you, not like you, or not at all like you?

V70. It is important to this person think up new ideas and to be creative; to do things one's own way.

1. Very much like me 2. Like me 3. Somewhat like me 4. A little like me 5. Not like me 6. Not at all like me.

V71. It is important to this person to be rich; to have a lot of money and expensive things.

1. Very much like me 2. Like me 3. Somewhat like me 4. A little like me 5. Not like me 6. Not at all like me.

V75. Being very successful is important to this person; to have people recognize one's achievements.

1. Very much like me 2. Like me 3. Somewhat like me 4. A little like me 5. Not like me 6. Not at all like me.

V76. Adventure and taking risks are important to this person; to have an exciting life.

1. Very much like me 2. Like me 3. Somewhat like me 4. A little like me 5. Not like me 6. Not at all like me.

V77. It is important to this person to always behave properly; to avoid doing anything people would say is wrong.

1. Very much like me 2. Like me 3. Somewhat like me 4. A little like me 5. Not like me 6. Not at all like me.

V160C I see myself as someone who tends to be lazy:

1. Disagree strongly 2. Disagree a little 3. Neither agree nor disagree 4. Agree a little 5. Agree Strongly 6. Don't know.

A.2. Propensity score matching analysis

Before predicting directors' values, we use the propensity score matching method based on a restricted subgroup (i.e., those employed and with high income) in the World Values Survey (China 2012). By employing this approach, we can identify a control sample of individuals in the restricted subgroup in the World Values Survey (China 2012) that show no significant differences in demographic and economic characteristics to bank directors in our treated sample. In this setup, we first employ a logit model to estimate the probability that an individual becomes a bank director, while controlling for the same demographic and socioeconomic variables in predicting values (e.g., individuals' age, gender and education). Then, we use the nearest-neighbor method to match individuals based on the propensity scores (predicted probability of being a bank director). More specifically, each bank director in the treated sample is matched with an individual in the restricted subgroup in the World Values Survey (China 2012). We further require the maximum difference between the propensity score of bank directors in our sample and that of the matched individuals to be 0.02 in its absolute value. Finally, we obtain 397 matched individuals in the World Values Survey (China 2012).

We then test the quality of matching. The results (see Table A2) show that all of the differences in means for each characteristic are not statistically significant after the matching. In other words, the matched individuals in the control sample are indistinguishable to the directors in the treated sample based on their demographic and economic information. This allows us to predict directors' personal values based on a group of matched individuals (397 matched individuals) in the restricted subgroup in the World Values Survey (China 2012). Additionally, all of the covariates are well balanced (require %bias to be less than 5%). In Fig. A2, we also present the distribution of estimated propensity scores of being a bank director for both unmatched and matched samples.

Table A2
Match balance checking.

Variable	Unmatched	Mean		% Reduct		t-Test	
		Matched	Treated	Control	% Bias	Bias	t p > t
Age	U		53.106	39.953	132.1		24.10 0.000
	M		52.158	52.331	− 1.7	98.7	− 0.46 0.649
Gender	U		0.878	0.580	71.2		13.10 0.000
	M		0.871	0.891	− 4.9	93.1	− 1.29 0.197

Middle level education	U	0.027	0.510	– 129.7		– 26.02	0.000
	M	0.028	0.025	1.0	99.3	0.45	0.650
High level education	U	0.965	0.309	186.8		36.85	0.000
	M	0.963	0.969	– 1.7	99.1	– 0.69	0.493
Pscore	U	0.907	0.184	324.3		60.62	0.000
	M	0.901	0.901	– 0.2	99.9	– 0.06	0.955

Note: All the observations in treated group and control group have the same income level (high) and the same employment status (employed).

Distribution of estimated propensity score of unmatched and matched samples

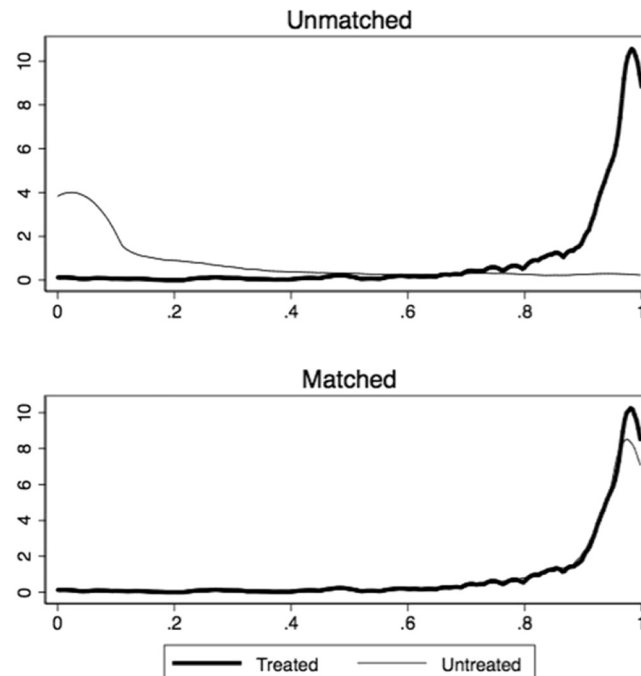


Fig. A2. Matching quality.

Notes: This figure shows the distribution of estimated propensity scores of being a bank director for both unmatched and matched samples.

Appendix B. Variables definition

Variables	Definition
Panel A: bank performance	
ROA	Net income/total assets
ROE	Net income/total equity
Z-score	The natural log of z-score = $\ln((ROA + E/A)/\sigma(ROA))$
NPLratio	Non-performing loans/total loans
Net Interest Margin	Net interest income/total earning assets
Pre-Provision Profit Ratio	(Operating income – operating expense)/total assets
Panel B: bank board age diversity	
Age diversity (CV)	Coefficient of variation of board age = $sd(age)/mean(age)$
Age diversity (LnSD)	Log of the standard deviation of board age
Age diversity (Blau)	Blau index of board age
Panel C: directors' personal values	
Value diversity (risk)	Coefficient of variation of directors' value on risk
Value diversity (prudence)	Coefficient of variation of directors' value on prudence
Value diversity (wealth)	Coefficient of variation of directors' value on wealth
Value diversity (success)	Coefficient of variation of directors' value on success

Value diversity (creativity)	Coefficient of variation of directors' value on creativity
Value diversity (slackness)	Coefficient of variation of directors' value on slackness
Panel D: control variables	
Board characteristics	
Independent directors	Percentage of independent directors
Board size	The natural log of board size
Duality	Dummy variable equals one if bank governor is also chairman of the board, and zero otherwise
Foreign directors	Percentage of foreign directors
Female directors	Percentage of female directors
Ownership characteristics	
State	Percentage of shares held by the largest shareholders if the largest shareholder is the government or a state-owned enterprise
Foreign	Percentage of shares held by the largest shareholders if the largest shareholder is a foreign investor
Private	Percentage of shares held by the largest shareholders if the largest shareholder is a private investor
Bank-specific measures	
Capital ratio	Equity/total assets
Loan ratio	Total loans/total assets
Size	The natural log of total assets
Bank age	The natural log of bank age
Listed	Dummy variable equals one if the bank has been listed at the end of the year, and zero otherwise
Location effects	
City GDP	The natural log of GDP per capita of city that the bank's headquarter is located

Appendix C

C.1. Board age diversity and bank performance: robustness test

	Profitability		Risk	
	ROA	ROE	Z-score	NPLratio
	(1)	(2)	(3)	(4)
Age diversity	− 0.003** (0.001)	− 0.048** (0.018)	− 0.022 (0.058)	0.011* (0.006)
Board size	0.000 (0.000)	0.001 (0.001)	− 0.001 (0.003)	− 0.000 (0.000)
Duality	− 0.003* (0.001)	− 0.021 (0.018)	0.096 (0.087)	0.005** (0.002)
Independent directors	0.005* (0.003)	0.078 (0.052)	0.269* (0.160)	− 0.029** (0.011)
Foreign directors	− 0.008* (0.004)	− 0.178** (0.076)	0.621** (0.303)	0.037** (0.018)
Female directors	0.001 (0.002)	0.020 (0.056)	0.004 (0.143)	− 0.003 (0.008)
State	0.009 (0.006)	0.178 (0.113)	0.188 (0.339)	− 0.039 (0.038)
Foreign	− 0.001 (0.008)	0.189 (0.145)	− 0.233 (0.468)	0.014 (0.033)
Private	− 0.010** (0.004)	− 0.101 (0.080)	0.012 (0.303)	0.052* (0.029)
Size	− 0.001 (0.001)	− 0.042* (0.025)	0.045 (0.080)	0.013* (0.007)
Listed	0.000 (0.001)	0.000 (0.018)	0.006 (0.055)	0.003 (0.005)
Loan ratio	− 0.004 (0.004)	− 0.081 (0.072)	− 0.235 (0.256)	0.027 (0.020)
Capital ratio	0.010 (0.010)	− 0.587*** (0.194)	2.719*** (0.652)	− 0.010 (0.039)

City GDP	– 0.002 (0.001)	– 0.022 (0.025)	– 0.034 (0.076)	0.001 (0.004)
Bank age	– 0.000 (0.002)	0.013 (0.029)	0.030 (0.080)	0.013** (0.007)
Year controls	Yes	Yes	Yes	Yes
N	349	349	349	342
R ²	0.242	0.189	0.203	0.218

Notes: This table presents the robust regression results for the effects of age diversity on bank performance (bank profitability and risk) in which age diversity is measured by the log of standard deviation of board age (*LnSD*). The left panel presents result of bank profitability measured by *ROA* and *ROE*. The right panel presents of bank risk measured by *Z-score* and *NPLratio*. *Board Size* is the natural log of board size. The dummy variable *Duality* equals one if bank governor is also chairman of the board, and zero otherwise. *Independent Directors* is the percentage of independent directors. *State* is the percentage of shares held by the largest shareholders if the largest shareholder is the government or a state-owned enterprise. *Foreign* is the percentage of shares held by the largest shareholders if the largest shareholder is a foreign investor. *Private* is the percentage of shares held by the largest shareholders if the largest shareholder is a private investor. *Size* is the natural log of total assets. *Bank Age* is the natural log of bank age. The dummy *Listed* equals one if the bank is listed at the end of the year, and zero otherwise. City GDP is the natural log of GDP per capita of city that the bank's headquarter is located. It employs the panel fixed effect estimator with lagged independent variables. Constant is included into the estimation but not reported. The robust error of each coefficient is shown in parentheses. *, **, *** indicate statistical significance level at 10%, 5% and 1%, respectively.

C.2. Board age diversity and bank performance: robustness test

	Profitability		Risk	
	ROA	ROE	Z-score	NPLratio
	(1)	(2)	(3)	(4)
Age diversity	– 0.006** (0.003)	– 0.066 (0.043)	0.011 (0.101)	0.010 (0.007)
Board size	0.000 (0.000)	0.001 (0.001)	– 0.001 (0.003)	– 0.000 (0.000)
Duality	– 0.002* (0.001)	– 0.018 (0.018)	0.089 (0.088)	0.004** (0.002)
Independent directors	0.006** (0.003)	0.067 (0.056)	0.322* (0.171)	– 0.028** (0.011)
Foreign directors	– 0.006* (0.004)	– 0.140** (0.067)	0.567* (0.299)	0.027* (0.015)
Female directors	0.001 (0.002)	0.029 (0.057)	0.005 (0.147)	– 0.003 (0.007)
State	– 0.002 (0.007)	0.194 (0.140)	– 0.310 (0.470)	0.011 (0.030)
Foreign	0.008 (0.006)	0.174 (0.112)	0.099 (0.348)	– 0.041 (0.039)
Private	– 0.010** (0.005)	– 0.084 (0.085)	– 0.015 (0.296)	0.050* (0.028)
Size	– 0.001 (0.001)	– 0.037 (0.025)	– 0.009 (0.090)	0.013* (0.007)
Listed	0.001 (0.001)	0.018 (0.013)	– 0.006 (0.053)	– 0.000 (0.005)
Loan ratio	– 0.004 (0.004)	– 0.041 (0.071)	– 0.278 (0.285)	0.025 (0.021)
Capital ratio	0.008 (0.012)	– 0.848*** (0.261)	1.778** (0.790)	– 0.001 (0.043)
City GDP	– 0.002 (0.001)	– 0.030 (0.025)	– 0.018 (0.076)	0.002 (0.004)
Bank age	– 0.000 (0.001)	0.016 (0.029)	– 0.030 (0.091)	0.013** (0.007)
Year controls	Yes	Yes	Yes	Yes
N	349	349	349	342
R ²	0.241	0.189	0.151	0.199

Notes: This table presents the robustness test of regression in Model (1) in which age diversity is measured by Blau index of board age diversity (*Blau*). The left panel presents result of bank profitability measured by *ROA* and *ROE*. The right panel presents of bank risk measured by *Z-score* and *NPLratio*. *Board Size* is the natural log of board size. *Duality* equals one if bank governor is also chairman of the board, and zero otherwise. *Independent Directors* is the percentage of independent directors. *State* is the percentage of shares held by the largest shareholders if the largest shareholder is the government or a state-owned enterprise. *Foreign* is the percentage of shares held by the largest shareholders if the largest shareholder is a foreign investor. *Private* is the percentage of shares held by the largest shareholders if the largest shareholder is a private investor. *Size* is the natural log of total assets. *Bank Age* is the natural log of bank age. *Listed* equals one if the bank is listed at the end of the year, and zero otherwise. City GDP is the natural log of GDP per capita of city that the bank's headquarter is located. It employs the panel fixed effect estimator with lagged independent variables. Constant is included into the estimation but not reported. The robust error of each coefficient is shown in parentheses. *, **, *** indicate statistical significance level at 10%, 5% and 1%, respectively.

C.3. Board age diversity and bank profitability: robustness test

	Profitability	
	Net Interest Margin	Pre-Provision Profit Ratio
	(1)	(2)
Age diversity	– 0.028* (0.015)	– 0.013** (0.006)
Board size	0.000 (0.000)	– 0.000 (0.000)
Duality	0.003 (0.003)	0.000 (0.001)
Independent directors	0.008 (0.005)	0.001 (0.002)
Foreign directors	0.006 (0.009)	– 0.001 (0.004)
Female directors	0.010 (0.007)	0.005** (0.002)
State	– 0.030* (0.016)	0.001 (0.006)
Foreign	– 0.010 (0.013)	– 0.001 (0.006)
Private	– 0.009 (0.011)	0.003 (0.006)
Size	0.002 (0.003)	– 0.001 (0.001)
Listed	– 0.000 (0.002)	0.000 (0.001)
Loan ratio	– 0.002 (0.008)	– 0.005 (0.004)
Capital ratio	0.016 (0.027)	– 0.017 (0.015)
City GDP	– 0.001 (0.004)	– 0.001 (0.002)
Bank age	0.001 (0.004)	– 0.002* (0.001)
Year controls	Yes	Yes
N	336	310
R ²	0.229	0.171

Notes: This table presents the regression results for the effects of age diversity on bank profitability. The dependent variables are bank profitability (i.e., *Net Interest Margin* and *Pre-Provision Profit Ratio*). *Age Diversity* is measured by coefficient of variation of board age (*CV*). *Board Size* is the natural log of board size. The dummy variable *Duality* is equal to one if the bank governor is also the chairman of the board, and zero otherwise. *Independent Directors* is the percentage of independent directors. *Foreign Directors* is the percentage of foreign directors. *Female Directors* is the percentage of female directors. *State* is the percentage of shares held by the largest shareholders if the largest shareholder is the government or a state-owned enterprise. *Foreign* is the percentage of shares held by the largest shareholders if the largest shareholder is a foreign investor. *Private* is the percentage of shares held by the largest shareholders if the largest shareholder is a private investor. *Size* is the natural log of total assets. *Bank Age* is the natural log of bank's age. The dummy *Listed* equals one if the bank is listed, and zero otherwise. City GDP is the natural log of GDP per capita of the city in which the bank's headquarters is located. It employs the panel fixed effect estimator with lagged independent variables. Constant is included into the estimation but not reported. The robust error of each coefficient is shown in parentheses. *, **, *** indicate statistical significance level at 10%, 5%, and 1%, respectively.

C.4. Board value diversity and bank performance (based on the restricted group)

	Value diversity (risk)	Value diversity (prudence)	Value diversity (wealth)	Value diversity (success)	Value diversity (creativity)	Value diversity (slackness)
Panel A: dependent variable is ROA						
ROA	– 0.024** (0.011)	– 0.047** (0.022)	– 0.019** (0.009)	– 0.073 (0.045)	– 0.027 (0.031)	– 0.004 (0.003)
Year controls	Yes	Yes	Yes	Yes	Yes	Yes
N	237	237	237	237	237	237
R ²	0.299	0.294	0.295	0.286	0.274	0.279

Panel B: dependent variable is ROE						
ROE	– 0.553** (0.232)	– 0.983** (0.488)	– 0.428** (0.199)	– 1.848** (0.869)	– 0.821 (0.751)	– 0.129* (0.069)
Year controls	Yes	Yes	Yes	Yes	Yes	Yes
N	237	237	237	237	237	237
R ²	0.306	0.293	0.299	0.292	0.274	0.285
Panel C: dependent variable is Z-score						
Z-score	– 0.210 (0.795)	0.115 (1.741)	– 0.285 (0.719)	0.801 (2.500)	– 0.896 (2.652)	0.034 (0.242)
Year controls	Yes	Yes	Yes	Yes	Yes	Yes
N	237	237	237	237	237	237
R ²	0.167	0.166	0.167	0.167	0.167	0.166
Panel D: dependent variable is NPLratio						
NPLratio	0.069 (0.042)	0.046 (0.089)	0.060* (0.035)	0.054 (0.151)	0.042 (0.128)	0.027* (0.015)
Year controls	Yes	Yes	Yes	Yes	Yes	Yes
N	234	234	234	234	234	234
R ²	0.164	0.228	0.116	0.284	0.243	0.192

Notes: This table presents the robust results for the effects of value diversity on bank performance based on the restricted group. Panel A presents results for regressing ROA on various value diversities. Panel B presents results for regressing ROE on various value diversities. Panel C presents results for regressing Z-score on various value diversities. Panel D presents results for regressing NPLratio on various value diversities. For the sake of saving space, the estimation results for control variables are omitted here. Constant is included into the estimation but not reported. The robust error of each coefficient is shown in parentheses. *, **, *** indicate statistical significance level at 10%, 5%, and 1%, respectively.

C.5. Board value diversity and bank performance (Bootstrap Regression)

	Value diversity (risk)	Value diversity (prudence)	Value diversity (wealth)	Value diversity (success)	Value diversity (creativity)	Value diversity (slackness)
Panel A: dependent variable is ROA						
ROA	– 0.029** (0.013)	– 0.051* (0.026)	– 0.020** (0.010)	– 0.052 (0.036)	– 0.030 (0.028)	– 0.003 (0.003)
Year Controls	Yes	Yes	Yes	Yes	Yes	Yes
N	454	454	454	454	454	454
R ²	0.304	0.298	0.299	0.286	0.276	0.275
Panel B: dependent variable is ROE						
ROE	– 0.651** (0.276)	– 1.049** (0.507)	– 0.439** (0.206)	– 1.370** (0.672)	– 0.848 (0.660)	– 0.095 (0.061)
Year ad Controls	Yes	Yes	Yes	Yes	Yes	Yes
N	454	454	454	454	454	454
R ²	0.314	0.298	0.305	0.297	0.280	0.282
Panel C: dependent variable is Z-score						
Z-score	– 0.037 (0.965)	0.569 (1.814)	– 0.122 (0.714)	1.183 (1.921)	– 0.232 (2.179)	0.075 (0.236)
Year Controls	Yes	Yes	Yes	Yes	Yes	Yes
N	454	454	454	454	454	454
R ²	0.192	0.193	0.192	0.194	0.192	0.193
Panel D: dependent variable is NPLratio						
NPLratio	0.082* (0.048)	0.051 (0.103)	0.060* (0.035)	0.033 (0.115)	0.043 (0.104)	0.018 (0.013)
Year controls	Yes	Yes	Yes	Yes	Yes	Yes
N	454	454	454	454	454	454
R ²	0.276	0.263	0.276	0.262	0.262	0.270

Notes: This table presents the bootstrap results for effects of value diversity on bank performance. Panel A presents results for regressing ROA on various value diversities. Panel B presents results for regressing ROE on various value diversities. Panel C presents results for regressing Z-score on various value diversities. Panel D presents results for regressing NPLratio on various value diversities. For the sake of saving space, the estimation results for control variables are omitted here. Constant is included into the estimation but not reported. The bootstrapped standard error of each coefficient is shown in parentheses. *, **, *** indicate statistical significance level at 10%, 5%, and 1%, respectively.

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