

IMPACT OF SUPERVISORY BOARD MEMBERS' PROFESSIONAL BACKGROUND ON BANKS' RISK-TAKING

Dennis Froneberg, Florian Kiesel*, Dirk Schiereck

Abstract

This paper examines the impact of financial expertise of supervisory board members on the risk-return profile of 200 German regional cooperative banks during the period 2004–2009. The results show that with more financial expertise the bank performance does not improve, but bank risk increases. These findings induce concerns that mandating financial expertise on boards is not necessarily beneficial for the risk-return profile of regional banks. We suggest that overconfidence of entrepreneurs in the supervisory boards leads to this unfavorable development since they represent the largest fraction of professionals within the sample.

Keywords: Regional Banks, Governance, Supervisory Board, Financial Expertise, Risk-Return Profiles, Germany

Jel classification: C23, G21, G32, G38

* Department of Business Administration, Economics and Law, Technische Universität Darmstadt, 64289 Darmstadt, Germany

1. Introduction

European banking markets became increasingly integrated and more competitive subsequent the implications of deregulation and innovation in the financial markets over the two decades prior to the credit crisis that started in late 2007. Consequently banks have expanded, changed, and discarded various business models in recent years due to shifts between regulation and deregulation, macroeconomic and political trends, industry competition, changing customer demands as well as domestic, foreign, and state ownership (e.g., Dermine, 2003, Goddard et al., 2007, DeYoung et al., 2004, Berger et al., 2005). On the back of this evidence bank managers have constantly adjusted their banks' risk-return profiles through policies with respect to financing, investment, organization and merger decisions (Malmendier and Tate, 2005, Bertrand and Schoar, 2003, Adams et al., 2005, Manove and Padilla, 1999). So far, theoretical evidence has not provided a clear picture concerning the ultimately optimal business model, and the started in 2007 banking crisis has proved that not all business models and their risk-return profiles are equally feasible and sustainable (Rajan, 1992, Diamond, 1991, Stein, 2002, Demirgüç-Kunt and Huizinga, 2010, Altunbas et al., 2011, Santos, 2001, Giammarino et al., 1993).

Healthy risk-return profiles are not only important for the stability and profitability of individual banks, but also for the whole financial system. Failures of single firms in the banking industry have a systemic dimension in contrast to other industries. Based on that both regulatory bodies

and academic research came to the conclusion to differentiate between the pure size of a financial institution and the systemic importance it has. New terms are focusing on the potential systemic impact if a particular institution fails. This systemic importance of financial institutions is the key issue in both financial stability assessments (Zhou, 2010). Previous theoretical considerations state that large banks, which are perceived "too big to fail," require rescue measures by governments as their failures are likely to result in the collapse of the whole financial system (Kaufman, 2002, Hoggarth et al., 2004). On the other hand in the case of the simultaneous failure of several weak, and not necessarily large banks, regulators might face a "too many to fail" problem, which could end in a systemic collapse as well (Brown and Dinç, 2011, Acharya and Yorulmazer, 2007).

Given the economic relevance and interaction banks can hardly be fully crisis resilient. Their business models are associated with uncertainty about liquidity needs and a maturity mismatch between assets and liabilities which is seen as substantial systematic-risk exposure yielding towards the fragility of institutions (Diamond and Rajan, 2001, Bhattacharya et al., 1998, Farhi and Tirole, 2012). Albeit risk-taking has significant ramification for the economy it is desirable that banks take some risks to bolster the economy (Levine, 2006, Rajan and Zingales, 1998). Financial intermediaries have fundamental channels which are linked to wealth-increasing projects of the private sector, banks facilitate the capital accumulation, trading, hedging, and pooling of risks (Levine, 1997, Kroszner et al.,

2007, Pang and Wu, 2009, Beck et al., 2000, Dell'Araccia et al., 2008).

Supervisory entities and government bodies reform financial regulations frequently to empower bank governance structures with the intention to ensure balanced risk-return profiles and to keep the banking system stable. Consequently a bank manager is calibrating a banks' risk-return profile within the limitations set by the regulation such as bank activities as well as capital and funding requirements (Barth et al., 2008). During and post financial crisis, the lack of sufficient industry expertise and effective framework have been recognized as an important shortcoming of internal bank governance mechanisms (Choundhry, 2011, Ard and Berg, 2010, Kirkpatrick, 2009, Hau and Thum, 2009, Peni and Vähämaa, 2012, Spong and Sullivan, 2010). Furthermore, the business model itself has become more complex and more opaque since the banks grew significantly and started expanding into new business areas creating unregulated exposure (Mehran et al., 2011).

On the back of this evidence, superior financial expertise of board members is considered as a potential framework to assess and manage risks better as well as to create more stable banks with balanced risk-return profiles from the inside. Regulators imposed comprehensive risk management frameworks in combination with the recommended governance structures focusing on the overall balance of the board in relation to the risk strategy of the business, taking into account the experience, behavioral and other qualities of individual directors (Walker, 2009, Aebi et al., 2012). The supervision of bank management and the risk-return profile of the bank are being performed through mandating independent directors in a one-tier system and supervisory board members in a two-tier system (Hopt and Leyens, 2004, John and Senbet, 1998, Jungmann, 2006). Especially the mandate holds for the latter one since this system separates management board and explicitly assigned management monitoring. The question, what the impact of greater financial expertise in internal governance on a banks' risk-return profile is, has not been analyzed in-depth yet.

But without waiting for respective empirical evidence, German bank regulation was sharpened with the target of increasing the required expertise for bank supervisory board members to foster bank stability and limit risks. Since 2009, provisions on vetting members of administrative and supervisory bodies were inserted in the Banking Act (*Kreditwesengesetz – KWG*) and the Insurance Supervision Act (*Versicherungsaufsichtsgesetz – VAG*) for the first time by virtue of the Act to Strengthen Financial Market and Insurance Supervision (*Gesetz zur Stärkung der Finanzmarkt- und der Versicherungsaufsicht*). The Federal Financial Supervisory Authority (*BaFin*) shall be authorized to dismiss members of the supervisory board of institutions and insurance companies if they are not

adequately qualified or not trustworthy, or if they act negligently in the exercise of their control functions. New elected members of supervisory boards of financial institutions such as banks and insurance companies in Germany have to meet new legal requirements in terms of financial expertise. In the future prospective members' competence will be checked by the *BaFin* in order to make sure that the supervisory board can exercise its tasks (*BaFin* and *Deutsche Bundesbank*, 2010).

This paper examines how financial expertise in internal governance mechanisms influences a bank's risk-return profile. It is challenging to divulge the actual influence of financial experts on the risk-return profile of a bank. Factors such as regulatory environment, business models, and competition in the banking industry have direct influence on the performance and the risk of banks. Furthermore, banks are characterized by different governance structures with either a one- or two-tier system across borders. These two factors are of high relevance since they result in a distortion of the analysis with regards to who mainly affects a banks' risk-return profile.

For the purpose of the intended analysis the German cooperative banks as an important pillar of the regional banking sector display a unique field of data. Since all banks within the sector operate in the same regulatory environment, and have similar business models, comparable regional reach, strategies, and organizational structures this sector provides a homogeneous object of investigation. The competitive advantage of the relatively small regional banks results from the concentration on selected market segments with two main roles, lending to small and mid-sized companies as well as to private households (*Mercieca et al.*, 2007).

The typical German two-tier board system that separates management and supervision also applies to regional banks including the general regulations on supervisory board members and labor co-determination (*Hopt and Leyens*, 2004). With regards to the governance perspective, the managers of these credit institutions have a particular characteristic compared to exchange-listed commercial banks since they are not confronted with a market for corporate control (*Manne*, 1965). Consequently, the absence of one governance instrument increases the importance of all other governance mechanisms. To analyze the consequences of different levels of financial expertise of supervisory board members this paper focuses on the period before 2009 where banks were completely free in the selection of board members. In response to the financial crisis, modifications of the German legislation have been implemented in 2009 to increase the quality of internal control and stability of the banking system.

For our examination on the influence of the financial expertise of supervisory board members on the risk-return profile of German regional banks the present study relies on a unique, manually collected

sample with more than 200 institutions comprising only entities being cooperative banks in its legal form. The size of the data set, the focus on a two-tier board structure as well as the proprietary compilation of data including the granularity is unrivaled given access to non-public data provided by the Deutsche Bundesbank. The paper identifies two important areas to discuss for the German banking sector and its regulator which we want to highlight at this point. Is financial expertise beneficial for the development of a German regional bank and its risk-return profile? It is evident that in a sector where risk taking is at the core of each company's business model, financial expertise should display a particularly important factor for the bank's risk-taking behavior. Based on the results showing that financial expertise does not lead to a favorable development of a risk-return profile of a bank it remains open what the optimal composition of a supervisory board of a regional bank is. In particular, the large fraction of entrepreneurs within a supervisory board has presumably a significant contribution to the deteriorated risk-return profile through their overconfidence.

The remainder of this paper is structured as follows: Section 2 provides an overview of the related literature with a particular focus on the influence of the financial expertise of board members, board composition and performance on regional banks' operations. Section 3 introduces the data, their sources and the empirical model. Section 4 shows the summary statistics and the results of the regression analysis. This section also exhibits the findings based on different measures and outlier treatments for robustness checks. Section 5 concludes the paper.

2. Literature Review

Studies with regards to the impact of financial expertise on risk-taking and performance can be classified into three segments: (i) board competence and expertise, (ii) board size and composition, and (iii) the performance, efficiency and stability of cooperative banks.

Board competence and expertise are mainly characterized by the professional experience of the board members. Positive relationships between financial expertise and performance measures has been identified for example by Cunningham (2008), Davidson et al. (2004), DeFond et al. (2005), Dhaliwal et al. (2006), Fernandes and Fich (2009), Lee et al. (1999), and Swan and Forsberg (2014). Davidson et al. (2004), DeFond et al. (2005), Fernandes and Fich (2009), and Lee et al. (1999) apply financial market information using stock price movement and abnormal returns as key metrics. They conclude that capital markets reward competence on the boards following the positive reaction of capital markets after the announcement of appointing financial experts. A different approach for performance measures is applied by Dhaliwal et al. (2006) who find a positive

correlation between accounting expertise and accruals quality based on the definition of three types of expertise: accounting, finance, and supervisory. This finding is underpinned by Cunningham (2008) who points out that particular accounting expertise is more important than any other kind of financial expertise. Swan and Forsberg (2014) show that former executives in the board, such as now retired CEOs and those who retain links with management, make better acquisition decisions, increase the proportion of incentives in CEO pay, and raise dividend payouts. They show that replacing such board members with independent directors declines the firm's performance.

Mixed results are provided by Carcello et al. (2008), Güner et al. (2008), Rosenstein and Wyatt (1990), and Minton et al. (2010). Güner et al. (2008) focusing on bankers as board members conclude that there is no significant impact on appointment decisions as far as there are no conflicts of interest between the bankers and the concerned company. Bankers can be detrimental to shareholder wealth in such incidents. According to Rosenstein and Wyatt (1990), all occupations are equally valuable to shareholders, with regard to share price reactions. Based on the findings of Carcello et al. (2008), expertise is not beneficial for real earnings management since other governance mechanisms are as good as financial expertise and have a positive impact on the quality of financial reporting. Focusing on the recent banking crisis Minton et al. (2010) analyze a sample of more than 650 unique firms consisting of over 300,000 board members over the 2000 to 2007 period the impact of financial expertise on bank risk and conclude that bank risk-taking is positively associated with greater financial expertise.

Focused on the peculiarities of the German two-tier system, only three studies investigate the relationship between expertise and effectiveness of supervisory boards to our knowledge. Kaplan (1994) shows that supervisory board monitoring works efficiently, as indicated by the management turnover, resulting from poor firm performance. The quality of supervision in banking is addressed in Hau and Thum (2009) who comprise a sample of the 29 largest German banks. They define 14 biographical criteria to assume competence by the members of the supervisory board. The results suggest that the financial fragility of the banks in the sample correlates with the monitoring ability of the supervisory board members. Delegating supervisory mandates to individuals with financial expertise is considered an option to stabilize the banking system. Schmielewski and Wein (2012) find that the risk-taking attitudes are closely related to the ownership structure. They analyze the ownership and the risk-taking behavior of bank managers of 397 German banks between 2000 and 2010. They conclude that risk-taking of bank managers depend on the ability to control them. The lower the monitoring capabilities of bank owners are,

the greater the probabilities of failures in choosing the optimal portfolio.

The second strand of related literature addresses the impact of board composition and board size on performance. Lipton and Lorsch (1992) and Jensen (1993) suggest that larger boards tend to be less effective due to co-ordination problems and director free-riding which might have adverse effects on performance and risk-taking. Empirical studies support this view (Yermack, 1996, Eisenberg et al., 1998). Another study portrays a U-shaped relation between the size of Monetary Policy Committees and inflation, implying that the lowest level of inflation will be reached at an optimum level of committee members. Research with focus on the banking industry does not necessarily support the theory that larger boards are less effective. A more recent study shows that strong bank boards [1] particularly small and less restrictive boards positively affect bank risk-taking (Pathan, 2009, Berger and Nitsch, 2011). This supports other views that larger boards lead to an increase in supervision and in advising management (Adams and Mehran, 2008).

The analysis of the majority of studies related to board composition is focused on the proportion of outside directors - not having the same scope given the peculiarity of the German two-tier board structure. Most studies do not find a causal relation between board composition and firm performance (Hermalin and Weisbach, 2003, Wintoki et al., 2012). Whereas Harris and Raviv (2008) develop theoretical models of board structure finding that optimal boards will employ large numbers of outside directors, and can be larger in overall size, Bermig and Frick (2010) confirm the missing consistent link between board composition and valuation and performance based on a sample of listed German firms in the period between 1998 and 2007 in contrast to Berger et al. (2012) who find a clear relationship between the socio-economical compositions of a board structure and bank's risk-taking. They analyze a data set for the entire board composition of German banks for the timeframe 1994-2010 and find that boards represented by younger executive teams and female executives tend to take on more risk, contrary to boards with a higher representation of Ph.D. degree holders where risk-taking declines.

The third related category of literature focuses on risk-taking, performance, and stability of regional banks with a focus on cooperative banks. The studies analyze these factors on a national as well as an international level (Beck et al., 2009, Cihák and Hesse, 2007, Westman, 2011, Altunbas et al., 2001, Iannotta et al., 2007, Ayadi et al., 2010, Hasan et al., 2012, Lang and Welzel, 1996). Overall, the evidence suggests that regional banks tend to be more stable than commercial banks. This finding can be confirmed for the German regional bank sector. Beck et al. (2009) show, using the z-score as metric for financial soundness, that German regional banks are more stable than German commercial banks due to the

lower earnings volatility. International comparisons confirm that regional banks are more stable than commercial banks, underlined by the better loan quality and lower asset risk of cooperative banks (Cihák and Hesse, 2007, Westman, 2011, Iannotta et al., 2007). In terms of efficiency and performance the results are mixed. Iannotta et al. (2007) exhibit that regional banks are slightly more efficient than other banks, however exhibiting lower profits than commercial banks. In this respect Altunbas et al. (2001) can confirm the results only partially, since they demonstrate that cooperatives have slight cost but also profit advantages over privately owned banks. Ayadi et al. (2010), conducting a European wide study, can confirm these mixed pictures, with respect to Germany they find that regional banks are more profitable in terms of ROE and ROA, while being less efficient due to a higher cost-to-income ratio than other banks.

It can be concluded that existing findings exhibit that financial expertise of board members is one of the factors influencing the risk-return profile of firms. Although, previous studies mainly focus on issues of board composition and board size in jurisdictions where a one-tier board system is in place. Further, the majority of studies, investigating the relationship between financial expertise and firm performance, do not deal with banks in particular. Finally, the quality of supervision in terms of financial expertise in two-tier board systems was largely neglected. The study of Hau and Thum (2009) can be considered as the most similar to our analysis, but their focus is slightly different. It deals with a relatively small sample of 29 large-scale German banks and bank losses only during the banking crisis years. The results suggest that the financial fragility of the banks in the sample correlates with the monitoring ability of the supervisory board members. Delegating supervisory mandates to individuals with financial expertise is considered an option to stabilize the banking system.

3. Data and Methodology

3.1 Sample and data

There is no public data base available for the supervisory board composition of German cooperative banks. The supervisory board composition and the individual's profession are collected manually from each bank's annual report. Balance sheet and profit and loss statement data are obtained from Deutsche Bundesbank's prudential database Bankaufsichtliches Informationssystem (BAKIS). The data access to the prudential information system BAKIS contains bank-specific data and is subject to special restrictions. The Hoppenstedt Banken database is used to access the merger history of each cooperative bank. Data for macroeconomic and structural control variables have been provided by the Regionaldatenbank Deutschland of the German Federal Statistical Office. The data

used in this study are based on the 200 largest regional banks in the legal form of cooperative banks during the period 2004–2009. Bank size is defined as total assets measured at the end of year 2009. Cooperative banks that are not of the legal form of a cooperative firm are excluded from the dataset.

In order to increase the explanatory power of the sample, the data set has to comply with several requirements. Financial expertise is approximated by the profession of supervisory board members. This requires concrete information about this item for each person. However, this is not always clearly mentioned. Given the category “other” where no assessment regarding financial expertise of an individual can be made, a maximum threshold of 10% for this category per bank has been defined. Consequently a maximum of 10% of the overall supervisory board, or one individual for supervisory boards of up to nine individuals, is allowed to be classified as “other”. If a cooperative has not been included in the analysis due to lack of data or a too high representation of individuals who could not clearly be labeled, the institution ranking subsequent in size is included, instead. Our sample covers 57% of the total assets of the German cooperative bank sector as of the end of 2009. The average cooperative bank in the sample has total assets of EUR 1.9 billion. The largest cooperative bank has total assets of EUR 41.4 billion, while the smallest bank has EUR 0.7 billion.

In addition, the present paper analyzes a merger-adjusted sample as robustness test. We run our analysis on the 150 largest cooperative banks which have not been involved in any mergers activities over the panel horizon and the two years preceding this horizon in order to control for potential distortions for merger activities.

3.2 Model and hypotheses

In the present study we address with our empirical model the following research question: “How are the risk, stability, and performance of regional banks impacted by (outside) financial expertise?” In the course of this research question, we test the following two hypotheses:

Hypothesis 1: (Risk-adjusted) performance of a regional bank is unrelated to the (outside) financial expertise of the supervisory board members.

Hypothesis 2: The stability and risk of a regional bank are not driven by the (outside) financial expertise of the supervisory board members.

The empirical examination is based on a panel analysis via a random effects regression model of the following general form:

$$DV_{it} = \alpha + \beta FE_{it} + \gamma B_{it} + \delta M_{it} + \varepsilon_{it} \quad (1)$$

where DV_{it} is the dependent variable of cooperative bank i at time t . Dependent variables for stability and risk are z-score and non-performing loans (NPL) ratio, whereas the dependent variables for performance are return on risk-weighted assets (RORWA) and return on equity (ROE), FE_{it} is the financial expertise, B_{it} is a vector of bank-specific variables, M_{it} is a vector of macroeconomic and structural control variables, and ε_{it} is the error term of cooperative bank i at time t . Vector B comprises (a) bank size, (b) bank size growth, (c) bank efficiency, (d) bank loan volume growth, (e) bank claims on monetary financial institutions (MFI), (f) bank claims on non-monetary financial institutions (non-MFI), and (g) supervisory board size. Vector M consists of the macroeconomic and structural control variables (h) area, (i) federal state, and (j) local GDP per capita.

3.3 Financial expertise

We define financial expertise as the ratio of members with financial expertise in the supervisory board to the total members in the supervisory board. The special access to micro data of German banks by BAKIS allows us to obtain the supervisory boards of German regional banks. A total of approximately 14,800 data points at the individual level are included in this study[2]. Financial expertise on the individual level is gauged based on their professional backgrounds. This follows previous studies (e.g., Davidson et al., 2004, Dhaliwal et al., 2006, Minton et al., 2010). The following professional backgrounds with assumed financial expertise have been constituted according to occupations with the help of publicly available data in the annual reports of the banks. This allows assumptions to be made regarding the financial expertise of the supervisory board members which is defined as outlined in Table 1.

Table 1. Professional backgrounds with assumed financial expertise

Level 1 Employment	Self-employed persons with assumed financial expertise	Employed persons with assumed financial expertise	Retired persons with assumed financial expertise
Level 2 Occupation	Entrepreneur, Merchant, Owner	Non-bank employee with assumed financial focus (e.g. members of management board)	Retired self-employed person with assumed financial expertise
	Managing Partner	Bank employee	Retired employed person with assumed financial expertise
	Partner	Public officer with assumed financial focus (e.g. treasurer)	
		Federal and State Minister, State Secretary	
		Local and regional politician	

The main idea behind this methodology is the obvious relation to financial issues. For instance, financial expertise is expected in the case of management board members. This approach follows other studies that were conducted in relation to the US-American Sarbanes-Oxley Act (SOX), which was released in 2002. SOX comprises requirements for the Audit Committees of companies whose securities are traded in the United States. Related studies analyze the impact of financial expertise in general and knowledge in accounting and auditing in particular on the risk and performance of companies (Carcello et al., 2008, Dhaliwal et al., 2006, Güner et al., 2008, Hau and Thum, 2009, Hermalin and Weisbach, 2003). These studies mainly use individuals' professional backgrounds as indications of qualifications. Only Hau and Thum (2009) and the recent study of Körner et al. (2014) consider additionally the educational background.

Further, the definition of financial expertise is mainly on the basis of the German regulatory bodies (BaFin and Deutsche Bundesbank, 2010). For instance, following the regulators' joint bulletin, financial expertise is assumed for potential mandatory members, such as mayors and district administrators. Both regulatory bodies do not explicitly specify the required competence levels, but provide indications concerning occupations and experiences that allow assumptions to be made regarding financial expertise. Professional experience gained in other areas might be also sufficient to justify financial expertise. Additionally, supervisory board members can gain relevant expertise through similar supervisory mandates and professional activities in the banking sector. Furthermore, regulatory bodies consider potential mandatory members, such as mayors and district administrators, whose board presence is legally required, to be financially literate (BaFin and Deutsche Bundesbank, 2010).

In the present study, we assume that self-employed persons generally have financial expertise. Self-employed persons are merchants within the meaning of the German Commercial Code. The definition of a merchant is very important in the German law, because merchants according the HGB law have certain obligations and duties. Especially §238 HGB commits to legal obligation to keep records.

Given the fact that details in the annual reports differ between banks, several assumptions concerning tenure, employment classification, and politicians have been applied. To control for the portion of employee representatives on the board the regression analysis is conducted twice for each sample. First, the financial expertise of the total supervisory board and its impact on risk and performance is tested. Second, employee representatives who are employed at the respective bank are excluded in order to analyze the impact on performance and risk of the outside

expertise of the free eligible supervisory board members.

3.4 Measurement of risk and performance

We apply two different measures for the analysis of bank risk. The first risk measure is the z-score that has widely been used for the analysis of bank risk (Boyd and Runkle, 1993, Laeven and Levine, 2009). We calculate z-scores for each cooperative bank to measure the individual bank's insolvency risk and follow Laeven and Levine (2009) for the calculation. Based on the idea that insolvency is the state in which a bank's capital does not suffice to absorb losses the probability of insolvency is defined as $\text{prob}(-\text{ROA} < \text{CAR})$ where ROA is the return on assets and CAR is the capital assets ratio (Roy, 1952). Given that profits are normally distributed the probability of insolvency becomes $(\text{ROA} + \text{CAR}) / \sigma(\text{ROA})$, where $\sigma(\text{ROA})$ is the 10 years standard deviation of ROA (Laeven and Levine, 2009). A higher z-value indicates a more stable bank. The ratio of loan loss provisions to loans serves as second risk measure. The variable NPL ratio indicates the loan loss provision. As we outlined at the beginning lending to small and mid-sized enterprises as well as to private households is one of the main pillars of regional banks' business and therefore represents an important measure for regional banks.

We measure performance with ROE and RORWA. ROE is defined as income before tax divided by average equity. RORWA is defined as income before tax divided by average risk-weighted assets. This allows reflecting the bank specific risk profile. Operating result is used for both performance measures in order to avoid distortions due to undisclosed reserves. These reserves are typically used when banks are in trouble (Beck et al., 2009).

3.5 Control variables

Besides bank-specific issues, we also control for macroeconomic as well as structural aspects. To factor in different bank sizes and growth rates, we apply the log of total assets and the annual change in total assets; for different efficiency levels we use the cost income ratio (CIR), which is defined as the ratio of general administrative expenses to operating result. To account for different levels of lending engagements we use the growth rate of the total loan volume. Additionally, the ratios of claims on MFI to total assets and claims on non-MFI to total assets are factored in. Further we control for the size of supervisory boards as larger boards tend to incentivize free-riding and this might lead to a negative effect of the supervisory board size on performance and risk (Jensen, 1993).

As regional banks have legally specified business areas, it is important to control for the region where the bank is located. We capture these structural differences by an index distinguishing between urban

and rural areas. Further a binary variable identifying federal states is applied. Regional banks which used to be in the former German Democratic Republic are assigned a value of one. The latter variable is important to control for the long-term business relationships. Regional banks in Eastern German federal states worked in a different structure and business environment under the East German regime until 1990. We measure the difference between urban and rural areas based on population. The differentiation between regional, district, and county centers is captured by an index with five clusters

which have been defined. For the discrimination between district and regional centers, areas with up to 1,000,000 inhabitants are divided into four clusters of 250,000 inhabitants each. The fifth cluster is comprised by areas with more than 1,000,000 inhabitants. This allows separating sparsely populated areas from densely populated and metropolitan areas. In order to differentiate the economic development, we considered the local GDP per capita. Table 2 gives an overview of the definitions and sources of all control variables.

Table 2. Definition of control variables and sources

Bank level control variables	Description	Source
Bank size	Ln of total assets	BAKIS (Deutsche Bundesbank)
Bank size growth	Year-to-year change in total assets	BAKIS (Deutsche Bundesbank)
Bank efficiency (cost-income ratio)	General administrative expenses to operating result	BAKIS (Deutsche Bundesbank)
Bank loan volume growth	Year-to-year change in total loans	BAKIS (Deutsche Bundesbank)
Bank claims on MFI	Claims on MFI divided by total assets	BAKIS (Deutsche Bundesbank)
Bank claims on non-MFI	Claims on non-MFI divided by total assets	BAKIS (Deutsche Bundesbank)
Bank supervisory board size	Number of supervisory board members	Annual reports
Macroeconomic and structural control variables		
Area	Index based on population within business area	Regionaldatenbank Deutschland
Federal state	Binary variable separating Western and Eastern federal state	Annual reports
GDP per capita	GDP of business area divided by population within business area	Regionaldatenbank Deutschland

4. Results

4.1 Summary statistics

Table 3 shows the supervisory board composition of the 200 largest cooperative banks and their financial expertise. There is no obvious strong stakeholder group dominating solely the composition of cooperative banks supervisory boards. Rather cooperative banks supervisory boards are characterized by a large fraction of self-employed and employed people, they account for almost the same

proportion of the board, comprising 40% and 50% respectively of the supervisory board. Notable is that only 5% of the members of cooperative banks' are employed at the respective bank, suggesting that insiders play a minor role. Further, our analysis reveals that politicians account for approximately 3% of the board members implying that cooperative banks are impacted by few political interest and influence. Other notable fractions are retired individuals which make up almost 10% of the supervisory board.

Table 3. Supervisory board composition

Variables	Mean	Std. Dev.	Coeff. of variation	Min	Max
Insider (%)	5.20	11.88	228.34	0.00	52.94
Outsider (%)	94.80	11.88	12.53	47.06	100.00
Employment					
Employed individuals (%)	50.22	22.94	45.68	0.00	100.00
Self-employed individuals (%)	39.55	23.49	59.40	0.00	91.67
Retired individuals (%)	9.20	11.86	128.99	0.00	77.78
Others (%)	1.03	2.76	268.43	0.00	14.29
Politicians					
Federal politicians (%)	0.09	0.90	1,020.84	0.00	11.11
Federal state politicians (%)	0.24	1.53	629.23	0.00	20.00
Local politicians (%)	1.83	4.24	231.21	0.00	25.00
Current and retired politicians (%)	2.80	5.53	197.83	0.00	35.29

The summary statistics of the variables is provided in Table 4. Despite the same focus and core business, regional banks display a relatively wide range of performance, with coefficients of variation of 65.70% for RORWA and 62.04% for ROE. The distribution range for RORWA is from -1.82% to 6.27% and for ROE from -17.62% to 55.21%. The average performance measured by RORWA is 1.21%,

whereas ROW is 12.19%. Risk and stability metrics show a similar pattern and variation, with coefficients of 65.24% for z-score and 74.15% for the NPL ratio. Z-score shows an average of 22.71, ranging in the distribution pattern from 3.61 to 103.23. The minimum NPL ratio in the sample reaches a peak of 13.47%, whereas the average NPL ratio is 2.66%.

Table 4. Summary statistics

Dependent variables	Mean	Std. Dev.	Coeff. of variation	Min	Max
RORWA (%)	1.21	0.80	65.70	-1.82	6.27
ROE (%)	12.19	7.56	62.04	-17.62	55.21
z-score	22.71	14.81	65.24	3.61	103.23
NPL ratio (%)	2.66	1.97	74.15	0.00	13.47
Bank level variables					
Financial expertise (%)	47.76	22.87	47.88	0.00	100.00
Outside financial expertise (%)	45.25	23.23	51.34	0.00	100.00
Bank size (ln '000s of EUR)	20.90	0.69	3.28	19.60	24.45
Bank efficiency (%)	66.48	9.55	14.37	15.98	112.92
Bank size growth (%)	2.61	4.61	176.76	-14.80	31.47
Board size	12.42	4.44	35.76	5.00	37.00
Loan growth (%)	4.98	7.44	149.52	-13.19	51.54
Claims on MFI (%)	11.89	6.59	55.47	0.06	45.65
Claims on non-MFI (%)	58.67	11.39	19.41	11.17	83.57
Macroeconomic and structural variables					
Federal state	0.02	0.14	700.29	0.00	1.00
GDP per capita ('000s of EUR)	28.04	7.32	26.12	9.39	62.04
Population	2.67	1.39	52.07	1.00	5.00

The analysis reveals that financial expertise at regional banks has a high variation, given the variation coefficient of 47.88. This is underlined by the fact that the distribution of financial expertise ranges from boards with zero percent financial expertise to boards composed by individuals assigned only with financial expertise. On average a board of a regional bank has a fraction of financial experts of 47.76%. The data sample adjusted for insiders, exclusion of bank employees, shows similar results and not much variation. Besides the board composition also the board size indicates high variation with a coefficient of variation of 35.76. The board size ranges from 5 individuals at the smallest board to 37 individuals at the largest board. On average a supervisory board of a regional bank has 12.42 members.

With regards to other bank-level variables, bank size growth and loan volume growth show the largest variation, whereas bank size has the lowest coefficient of variation within the sample. Our results suggest that, over the years, regional banks shift their focus on the more profitable lending business by allocating their assets without growing in total bank size by the same factor. Whereas average bank growth is 2.61%, the loan volume grows at an average rate of 4.98%. Bank size shows the lowest coefficient of 3.28 indicating that bank size of our sample is nearly comparable. Bank efficiency is relatively homogeneous among all banks as indicated by the

relatively low coefficient of variation of 14.37%. The non-MFI engagement by regional banks does not diverge much, as indicated by the low coefficient of variation, regardless of a broad range between minimum and maximum values. In contrast regional banks are rather different in their inter-bank activities as the coefficient of variation for claims on MFI shows.

Table 5 reports pair wise correlation coefficients. The matrix explaining the correlation between RORWA and ROE is positive and statistically significant, while the correlation between RORWA and financial expertise shows a negative relationship. These correlations indicate that cooperative banks with higher financial expertise have a lower level of RORWA and the performance of a bank decreases with a higher financial expertise ratio in the supervisory board. A significantly positive association is shown for the correlation between financial expertise and the NPL ratio, indicating that banks with higher financial expertise in the supervisory board are likely to enlarge their non-performing loans. This risk measure is highly important for cooperative banks due to the large engagement in the lending business. However, the opposite is true for the relation between financial expertise and the z-score. Overall, these correlation coefficients suggest that financial expertise has a negative influence on the performance and at least partial negative influence on the risk of cooperative banks.

Table 5. Correlation coefficients among variables of interest

	RORWA	ROE	Z-score	NPL ratio	Financial expertise	Outside financial expertise	Bank size	Bank efficiency	Bank size growth	Bank loan growth	Claims on MFI	Claims on Non MFI	Board size	GDP per capita	Population	Federal state
RORWA	1.0000															
ROE	0.9023*	1.0000														
Z-score	0.1428*	0.0842*	1.0000													
NPL ratio	-0.0610*	-0.0595*	-0.0025	1.0000												
Financial expertise	-0.1008*	0.0728*	0.1527*	0.1755*	1.0000											
Outside financial expertise	-0.0800*	0.0627*	0.1431*	0.2384*	0.9575*	1.0000										
Bank size	-0.0785*	-0.0486	0.1088*	0.2792*	0.2010*	0.0085	1.0000									
Bank efficiency	-0.3240*	0.3421*	-0.0240	0.1415*	0.1005*	0.1230*	0.1898*	1.0000								
Bank size growth	0.0362	0.0379	-0.0560	0.2707*	-0.0928*	-0.1109*	0.1061*	-0.1050*	1.0000							
Bank loan growth	0.2621*	0.1778*	0.0741*	-0.0031	-0.0553	-0.0732*	0.1463*	-0.0624*	0.6166*	1.0000						
Claims on MFI	-0.0589*	0.1285*	0.1304*	-0.0354	0.0311	0.0387	0.0615*	0.1001*	0.0970*	0.0052	1.0000					
Claims on non-MFI	-0.1589*	0.0633*	0.2899*	0.2025*	-0.0059	-0.0025	0.1987*	0.0887*	0.1558*	0.1568*	0.4040*	1.0000				
Supervisory board size	-0.0259	0.0051	0.1771*	0.0602*	-0.0101	-0.0793*	0.2213*	-0.0203	-0.0230	-0.0446	0.1281*	0.0917*	1.0000			
GDP per capita	-0.0807*	0.1111*	0.0671*	0.1339*	0.0863*	0.0455	0.2971*	0.0071	0.0866*	0.0784*	0.1931*	0.1029*	0.1170*	1.0000		
Population	-0.0271	-0.0359	0.1609*	0.3973*	-0.0115	-0.1354*	0.6413*	-0.1898*	0.1223*	0.0956*	0.1393*	0.2820*	0.0000	0.3317*	1.0000	
Federal state	0.0280	0.0236	0.0815*	-0.0093	0.0549	0.0695*	0.1280*	0.0849*	-0.0267	-0.0249	0.0601*	0.2834*	-0.0362	0.0908*	-0.0517	1.0000

* significant at the 5% level

In a next step, all cooperative banks are split into four equal clusters by financial expertise consisting of 50 banks each in order to analyze the linkage between the different levels of financial expertise and the performance, risk, and stability of a bank. Table 6 shows the bank-level variables clustered by financial expertise. Cluster 1 comprises the banks with the highest levels of financial expertise, and Cluster 4 contains those with the lowest levels. The analysis indicates that financial expertise of the supervisory board tends to reduce stability. Another interpretation is that in situations of high risk cooperative banks might specifically appoint new supervisory board members with high expertise. Regional banks in Cluster 1 and Cluster 2 have a meaningful lower z-score and higher NPL ratio than those in Cluster 3 and 4. The increased risk-taking within Cluster 1 and 2 does not get paid off by higher performance. The performance of regional banks tends to deteriorate

with increasing financial expertise. This trend is consistent across both metrics RORWA and ROE from Cluster 1 to 3 whereas Cluster 4 shows a slightly lower performance than Cluster 3 and 2, but still higher than Cluster 1.

Other variables worth looking at are bank size and efficiency. The analysis demonstrates that larger banks have a higher level of financial expertise. This could be traced back to the hypothesis that the larger the bank, the more complex its business model and strategy as well as the range of activities, and the higher the requirements for financial expertise are. In contrast to the size effect the variable bank efficiency shows that regional banks with high expertise reveal significantly higher CIRs than low-expertise regional banks which leads to the hypothesis that larger banks are less efficient.

Table 6. Bank-level variables, clustered by financial expertise

Dependent variables	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Delta 1-4	Cluster
RORWA (%)	1.05	1.24	1.34	1.22	-0.17	
ROE (%)	10.86	12.37	13.54	11.99	-1.13	
z-score	19.05	22.18	24.52	25.06	-6.01	
NPL ratio (%)	3.14	2.70	2.59	2.22	0.92	
Bank level variables						
Financial expertise (%)	76.53	54.89	39.85	19.78	56.75	
Outside financial expertise (%)	72.95	53.04	36.87	18.13	54.82	
Bank size (ln '000s of EUR)	21.09	20.89	20.88	20.74	0.35	
Bank efficiency (%)	67.92	66.54	65.61	65.88	2.04	
Bank size growth (%)	1.82	2.96	2.62	3.01	-1.19	
Board size	12.65	11.66	12.67	12.69	-0.04	
Loan growth (%)	4.08	5.26	5.03	5.54	-1.46	
Claims on MFI (%)	12.06	11.97	13.06	10.47	1.59	
Claims on non-MFI (%)	59.73	57.06	58.46	59.44	0.29	

The cluster analysis shows that the loan volume of Cluster 4, 3 and 2 have higher growth rates than Cluster 1. This suggests that loan growth could lead to stability. This finding is, however, inconsistent with the results of the correlation matrix. The correlation coefficient between loan growth and z-score is negative and significant on the 5% level. Therefore, we cannot conclude that loan growth leads to more stability.

Table 7 provides evidence of the significance between the clusters. The performance and risk

variables of Cluster 1 are significantly different to the other clusters. The z-score does not significantly change for the analysis between Cluster 3 and 4, whereas the NPL ratio is not significantly different between Cluster 2 and 3, respectively. We do not find any significance between Cluster 2 and 4 for the performance measures. However, we find in general that our performance and risk measures differ significantly between the clusters. Therefore, we conclude that financial expertise on supervisory boards have an impact on the risk-return profile.

Table 7. Pairwise test of the significance between expertise clusters

Dependent variables	Cluster 1 vs. 2 t (p-value)	Cluster 1 vs. 3 t (p-value)	Cluster 1 vs. 4 t (p-value)	Cluster 2 vs. 3 t (p-value)	Cluster 2 vs. 4 t (p-value)	Cluster 3 vs. 4 t (p-value)
RORWA	-2.9746 0.0032	*** -5.1122 0.0000	*** -2.8960 0.0041	*** -1.7083 0.0886	* 0.2822 0.7780	2.2395 0.0259
ROE	-2.4392 0.0153	** -4.8278 0.0000	*** -2.0750 0.0388	** -2.0154 0.0448	** 0.7044 0.4817	3.0085 0.0028
z-score	-2.9416 0.0035	*** -5.1116 0.0000	*** -5.3941 0.0000	*** -2.1057 0.0361	** -2.2044 0.0283	** -0.3978 0.6910
NPL ratio	2.9874 0.0031	*** 4.0449 0.0001	*** 6.0319 0.0000	*** 0.5127 0.6085	2.9269 0.0037	*** 2.2893 0.0228
Bank level variables						
Financial expertise	36.4796 0.0000	*** 62.4921 0.0000	*** 107.0168 0.0000	*** 31.6913 0.0000	*** 58.9953 0.0000	*** 35.3432 0.0000
Outside financial expertise	25.2058 0.0000	*** 37.7623 0.0000	*** 79.3250 0.0000	*** 20.1509 0.0000	*** 47.0515 0.0000	*** 21.5942 0.0000
Bank size	4.0484 0.0001	*** 3.5593 0.0004	*** 6.9548 0.0000	*** 0.2905 0.7716	3.3427 0.0009	*** 2.2812 0.0232
Bank efficiency	1.8552 0.0645	* 3.4015 0.0008	*** 3.2641 0.0012	*** 1.2181 0.2241	0.8768 0.3813	-0.4186 0.6758
Bank size growth	-3.3467 0.0009	*** -1.9672 0.0502	* -3.2731 0.0012	*** 1.0335 0.3023	-0.3325 0.7397	-0.8804 0.3795
Board size	2.7820 0.0057	*** -0.0637 0.9492	-0.0953 0.9242	-3.5862 0.0004	*** -2.8178 0.0052	*** -0.0343 0.9726
Loan growth	-2.6742 0.0080	*** -2.0712 0.0393	** -3.1177 0.0020	*** 0.4078 0.6837	-0.4854 0.6278	-0.7861 0.4325
Claims on MFI	0.1639 0.8699	-1.9450 0.0527	* 2.9122 0.0039	*** -1.9462 0.0526	* 2.8777 0.0043	*** 4.6932 0.0000
Claims on non-MFI	2.8703 0.0044	*** 1.7566 0.0800	* 0.3068 0.7592	-1.4140 0.1584	-2.4490 0.0149	** -1.1065 0.2694

* indicates significance at the 10% level, ** at the 5% level, and *** at the 1% level, respectively

4.2 Regression Results

The results of the random-effect regressions with the dependent variables RORWA and ROE are shown in Table 8. As indicated by the Wald-Chi square value, all regressions with RORWA and ROE as dependent variable are significant at the 1% level. The regression results document that financial expertise does not have a positive impact on the performance of regional banks. On the contrary, financial expertise tends to influence negatively the bank's performance. However, the coefficients of total board financial expertise and outside financial expertise are not significant for RORWA and ROE. This finding is at odds with the corporate finance theory postulating appropriate compensation for risk according to the risk-return trade-off. Loan volume growth is next to board size the only variable which is positively associated with the performance whereas all other variables have a negative impact. The variable loan volume growth is significant on the 1% level, whereas board size shows only a positive tendency without significance. This finding suggests that the lending

activities as core business and focus of a regional bank are still a meaningful profitability driver.

The result of bank size, which is negative and highly significant, is in contrast to the hypothesis that larger boards might lead to members' perceived lower personal responsibility for performance and, therefore, ease free-riding (Harris and Raviv, 2008). There is further evidence as shown by the considerations of Jensen (1993) as well as of Lipton and Lorsch (1992) that larger boards are detrimental to performance.

With regards to the negative impact of bank size profitable growth of a regional bank is restricted due to the limitations in terms of highly profitable projects. Consequently large regional banks can only underwrite projects at some point with lower profitability leading to shrinking total returns. This might explain the effect that bank size growth reduces profitability. Remarkably, economic strength, defined as per capita GDP, is the only of the structural variables having a significant impact on performance, neither population density nor the regional aspects have a significant impact on performance.

Table 8. Random-effect regressions with dependent variables RORWA and ROE

Variable		RORWA (RE)		RORWA (RE)		ROE (RE)		ROE (RE)					
		Financial expertise		Out. financial expertise		Financial expertise		Out. financial expertise					
		Coeff.	SE (robust)	Coeff.	SE (robust)	Coeff.	SE (robust)	Coeff.	SE (robust)				
Financial expertise	Financial expertise	-0.0010	0.0013			-0.0033	0.0139						
	Outside financial expertise			-0.0012	0.0013			-0.0067	0.0136				
	Bank size	-0.2680	0.0598	***	-0.2720	0.0575	***	-1.9734	0.6668	***	-1.9690	0.6355	***
	Bank efficiency	-0.0262	0.0033	***	-0.0262	0.0034	***	-0.2707	0.0345	***	-0.2702	0.0345	***
Bank level	Bank size growth	-0.0408	0.0073	***	-0.0409	0.0073	***	-0.2505	0.0700	***	-0.2515	0.0699	***
	Board size	0.0074	0.0068		0.0071	0.0069		0.0835	0.0661		0.0809	0.0667	
	Loan growth	0.0433	0.0041	***	0.0434	0.0041	***	0.2693	0.0334	***	0.2692	0.0333	***
	Claims on MFI	-0.0088	0.0048	*	-0.0088	0.0048	*	-0.1319	0.0459	***	-0.1318	0.0459	***
	Claims on Non-MFI	-0.0144	0.0029	***	-0.0145	0.0029	***	-0.0634	0.0312	**	-0.0639	0.0311	**
Macroeconomic and structural environment	Federal state	-0.1279	0.0869		-0.1282	0.0850		0.5330	1.4624		0.5577	1.4346	
	GDP per capita	-0.0062	0.0042		-0.0061	0.0042		-0.1055	0.0433	**	-0.1047	0.0430	**
	Population	0.0054	0.0334		0.0036	0.0332		0.0882	0.3083		0.0700	0.3079	
	constant	9.5131	1.1456	***	9.6152	1.1022	***	77.9055	13.5145	***	78.0171	12.8751	***
	Wald Chi2	279.63		***	282.37		***	179.88		***	181.73		***
	R-sq	0.2548			0.2553			0.1858			0.186		
	No of observations	1,116			1,116			1,116			1,116		

* indicates significance at the 10% level, ** at the 5% level, and *** at the 1% level, respectively. Standard errors control for clustering at the bank level. Multicollinearity is controlled with variance inflation factors lower 2.

Table 9 shows the results of the random-effect regressions with the dependent variables z-score and NPL ratio. All regression models with z-score and NPL ratio as dependent variables are significant at the 1% level as well - as indicated by the Wald-Chi square value. In contrast to the performance regressions, the financial expertise coefficients are significant in the regressions of the risk variables. We find that financial expertise has a negative sign and the coefficient of outside financial expertise is significant at the 5% level, whereas the variable financial expertise is not significant for the z-score. The results suggest that financial expertise leads to greater risk-taking rather than stabilizing banks. This is supported by the observation that financial expertise tends to increase the loan portfolio risk. These results are remarkable as financial expertise reduces profitability and leads to greater risk taking. Boards of regional banks, in particular cooperative banks, are characterized by a relatively high fraction of entrepreneurs[4]. This group of professionals is supposed to have a solid understanding of business risk and selection. Our results show that they tend to overestimate their abilities though and advocate for higher risk taking. The results also assume that the members of cooperative banks might specifically appoint new supervisory board members with high expertise in situations of high risk. In this case the risk taking induces appointing board members with financial expertise. However, most of the individuals of the supervisory board have been member of the board before the financial crisis started. Moreover, we studied the annual reports of banks with high and low supervisory board expertise for divergences in reported risk taking strategies but we could not detect any indications in this direction. Nevertheless, we

cannot finally exclude the possibility of such a reverse causality.

Compared to z-score, most of the bank-level control variables are significant in the regression with the NPL ratio as dependent variable. In this connection the variables show different impacts on loan portfolio risk and bank stability. We find that while loan growth increases the portfolio risk, bank size growth contributes to a lower NPL ratio. Interestingly this effect is conversely on the bank stability. Given the negative effect of loan volume growth on stability, we hypothesize that regional banks can only primarily grow by underwriting business which jeopardize the risk profile of the bank and subsequently its loan portfolio.

Concerning the bank size and bank size growth, our analysis shows that these variables have a consistent positive effect on loan portfolio risk given the reduction of the NPL ratio, however both variables are not significant for the bank stability, measured by the z-score. Whereas regional banks can improve their loan portfolio and stability through economies of scale, our results indicate that there are not any further diversification effects on the loan portfolio side which help reducing the loan portfolio risk and increasing the bank stability.

The negative impact of board size on the loan portfolio underlines the free-riding hypothesis from the performance regressions. The perceived lower personal responsibility in large boards might result in a less strict lending policy, which explains the increasing effect on the NPL ratio. The results also show a tendency that board size has a negative impact on the z-score, however the results are not significant.

Table 9. Random-effect regressions with dependent variables z-score and NPL ratio

Variable	z-score		(RE) z-score		(RE) NPL Ratio		(RE) NPL Ratio		(RE)				
	Financial expertise		Out. financial expertise		Financial expertise		Out. financial expertise						
	Coeff.	SE (robust)	Coeff.	SE (robust)	Coeff.	SE (robust)	Coeff.	SE (robust)					
Financial expertise	Financial expertise	-0.0719	0.0453			0.0118	0.0041	***					
	Outside financial expertise			-0.0960	0.0408	**			0.0122	0.0039	***		
Bank level	Bank size	-1.7478	2.4256	-1.9359	2.4345		-0.5093	0.1680	***	-0.4444	0.1633	***	
	Bank efficiency	-0.0640	0.0254	**	-0.0627	0.0257	**	-0.0012	0.0059	-0.0011	0.0059		
	Bank size growth	0.0492	0.0585		0.0468	0.0578		-0.1578	0.0144	***	-0.1576	0.0144	***
	Board size	-0.1938	0.2619		-0.2124	0.2641		0.0442	0.0195	**	0.0460	0.0196	**
	Loan growth	-0.0926	0.0385	**	-0.0911	0.0380	**	0.0945	0.0106	***	0.0941	0.0106	***
	Claims on MFI	-0.0067	0.0716		-0.0104	0.0724		0.0338	0.0116	***	-0.1576	0.0144	***
	Claims on Non-MFI	0.2081	0.1205	*	0.2021	0.1201	*	0.0292	0.0083	***	0.0941	0.0106	***
Macroeconomic and structural environment	Federal state	-4.6956	4.8127		-4.5279	4.9777		-0.2500	0.8592		-0.2207	0.8572	
	GDP per capita	-0.0359	0.1503		-0.0249	0.1497		-0.0454	0.0139		-0.0459	0.0140	
	Population	-0.8731	1.1510		-1.0190	1.1407		-0.2536	0.0815		-0.2458	0.0816	
	Constant	60.838	56.2943		66.290	57.1181		12.010	3.4530	***	10.580	3.4139	***
	Wald Chi2	65.45		***	64.05		***	268.99		***	269.11		***
	R-sq	0.0959			0.1004			0.2979			0.3005		
	No of observations	1,116			1,116			1,103			1,103		

* indicates significance at the 10% level, ** at the 5% level, and *** at the 1% level, respectively. Standard errors control for clustering at the bank level. Multicollinearity is controlled with variance inflation factors lower 2

Greater financial expertise does not necessarily lead to greater controlling and monitoring of bank risk as shown by our analysis (e.g., Chuang and Lee, 2006, Fellner et al., 2004). Further evidence documents Odean (1998) who shows that the greater expertise individuals have, the more overconfident they tend to be. This research field is also investigated by Dittrich et al. (2005) who demonstrate that overconfidence tends to increase with task complexity.

The regression analyses show that financial expertise on supervisory boards of regional banks in the form of cooperative banks cannot contribute to more bank stability and less loan portfolio risk, rather lead to greater risk taking. These findings lend support to the evidence from Minton et al. (2010), who show that higher bank risk levels are associated with higher financial expertise. The detrimental impact on risk and stability suggests that financial experts explicitly advocate more risk-taking, which Acharya et al. (2011) and Wallison (2009) describe as a “race to the bottom” in relation to the mortgage quality and ability to increase support for affordable housing. Overall, financial experts tend to deteriorate the risk-return profile. Since the negative impact on risk cannot be set off by a higher performance. Our results document that financial expertise does not improve bank profitability and suspends the risk-return trade-off.

4.3 Merger-controlled sample

Besides our sample which consists of the largest 200 cooperative banks, we run our analysis on the 150 largest cooperative banks which have not been involved in any mergers activities over the panel horizon and the two years preceding this horizon in order to control for potential distortions for merger activities. Merger activities are one major confounding event for risk taking. We find 107 banks with merger activities in our 200 largest cooperative banks sample. Therefore, we extend the data set with 57 banks which have no merger activities in our investigation period, but are smaller than the 200 largest cooperative banks. In total 257 cooperative banks have been considered in this study. The merger-controlled banks account for 35% of the cooperative bank sector’s total assets. The average of total assets in the merger-controlled sample is EUR 1.6 billion. The findings of the merger-controlled sample remain qualitatively identical.

Table 10 shows the results of the random-effect regression for the merger-controlled sample with the dependent variables RORWA and ROE. We find that financial expertise has no significant impact on RORWA or ROE. This is consistent with the findings of the 200 largest cooperative banks without controlling for merger activities. The results also indicate that the findings are robust for the control variables. This suggests that merger activities do not change the results so far.

Table 10. Random-effect regression with dependent variable RORWA and ROE analyzing the 150 largest merger-controlled cooperative banks

Variable	RORWA		(RE) RORWA		(RE) ROE		(RE) ROE		(RE)				
	Financial expertise		Out. financial expertise		Financial expertise		Out. financial expertise						
	Coeff.	SE (robust)	Coeff.	SE (robust)	Coeff.	SE (robust)	Coeff.	SE (robust)					
Financial expertise	-0.0110	0.0170			-0.0008	0.0015							
Financial expertise			-0.0134	0.0166			-0.0011	0.0015					
Bank level													
	Bank size	-2.0404	0.6844	***	-2.0849	0.6603	***	-0.2937	0.0630	***	-0.2965	0.0609	***
	Bank efficiency	-0.2993	0.0389	***	-0.2991	0.0389	***	-0.0283	0.0037	***	-0.0282	0.0037	***
	Bank size growth	-0.2776	0.0736	***	-0.2790	0.0737	***	-0.0435	0.0078	***	-0.0436	0.0078	***
	Board size	0.1622	0.1056		0.1582	0.1065		0.0094	0.0096		0.0090	0.0097	
	Loan growth	0.2688	0.0399	***	0.2690	0.0399	***	0.0414	0.0045	***	0.0415	0.0045	***
	Claims on MFI	-0.1873	0.0530	**	-0.1875	0.0530	**	-0.0132	0.0053	***	-0.0132	0.0053	***
	Claims on Non-MFI	-0.0540	0.0354	***	-0.0556	0.0356	***	-0.0137	0.0034		-0.0138	0.0034	
Macroeconomic and structural environment	Federal state	3.7231	1.3706		3.7074	1.3594		0.2776	0.2216	***	0.2768	0.2214	***
	GDP per capita	0.0259	0.0300		0.0260	0.0299		0.0009	0.0028		0.0010	0.0028	
	Population	0.5925	0.3859	**	0.5757	0.3876	**	0.0813	0.0356		0.0796	0.0355	
	constant	75.4903	13.2886	***	76.6627	12.9471	***	9.6942	1.2090	***	9.7778	1.1848	***
	Wald Chi2	164.84		***	166.49		***	239.51		***	238.69		***
	R-sq	0.2055			0.2056			0.2663			0.2664		
	No of observations	896			896			896			896		

* indicates significance at the 10% level, ** at the 5% level, and *** at the 1% level, respectively. Standard errors control for clustering at the bank level. Multicollinearity is controlled with variance inflation factors lower 2.

The results of the random-effect regression for the merger-controlled sample with the risk variables z-score and NPL ratio are shown in Table 11. Financial expertise is still negative for the z-score, but financial expertise is not statistically significant. In the regression model of the non-controlled merger sample, outside financial expertise was significant at

the 5% level. This indicates that merger activities may influence the results of the z-score. However, we find that the NPL ratio for the merger-controlled sample is highly significant. Therefore, we conclude that our results are overall robust for merger activities. The results are not driven by merger activities.

Table 11. Random-effect regression with dependent variables z-score and NPL ratio analyzing the 150 largest merger-controlled cooperative banks

Variable	z-score		(RE)z-score		(RE)NPL		Ratio		(RE)NPL		Ratio		(RE)
	Financial expertise		Out. financial expertise		Financial expertise		Out. financial expertise						
	Coeff.	SE (robust)	Coeff.	SE (robust)	Coeff.	SE (robust)	Coeff.	SE (robust)	Coeff.	SE (robust)			
Financial expertise	-0.0213	0.0232			0.0115	0.0044	***						
Financial expertise			-0.0258	0.0229					0.0116	0.0043	***		
Bank level													
	Bank size	-3.4713	1.3903	**	-3.4892	1.4183	**	-0.4423	0.1557	***	-0.3892	0.1580	**
	Bank efficiency	-0.0148	0.0079	*	-0.0145	0.0080	*	-0.0025	0.0065		-0.0025	0.0064	
	Bank size growth	-0.0571	0.0171	***	-0.0575	0.0170	***	-0.1634	0.0161	***	-0.1631	0.0161	***
	Board size	0.1439	0.1722		0.1368	0.1712		0.0676	0.0301	**	0.0696	0.0302	**
	Loan growth	0.0022	0.0123		0.0025	0.0123		0.0947	0.0112	***	0.0946	0.0112	***
	Claims on MFI	-0.0337	0.0197	*	-0.0347	0.0197	*	0.0180	0.0124		0.0183	0.0124	
	Claims on Non-MFI	0.0484	0.0261	*	0.0479	0.0259	*	0.0370	0.0091	***	0.0377	0.0092	***
Macroeconomic and structural environment	Federal state	-1.2522	3.1739		-1.2137	3.1599		1.0533	0.7308		1.0720	0.7272	
	GDP per capita	0.4232	0.4853		0.3898	0.4798		-0.3939	0.0882	***	-0.3882	0.0887	***
	Population	0.0137	0.0136		0.0137	0.0138		-0.0122	0.0042	***	-0.0123	0.0042	***
	constant	85.9926	27.8159	***	86.7101	28.3948	***	9.5360	3.3429	***	8.3848	3.4395	**
	Wald Chi2	197.97		***	196.09		***	292.94		***	295.91		***
	R-sq	0.0835			0.0876			0.347			0.348		
	No of observations	896			896			885			885		

* indicates significance at the 10% level, ** at the 5% level, and *** at the 1% level, respectively. Standard errors control for clustering at the bank level. Multicollinearity is controlled with variance inflation factors lower 2.

4.4 Robustness Checks

In order to run the robustness checks, the panel of the largest 200 cooperative banks as well as the merger-

controlled sample is adjusted in two ways. All variables are truncated, except for the binary variable (federal state) and the index variable on population (area). First, all observations smaller than the 1st

percentile of the distribution are set to the value of the 1st percentile. Observations larger than the 99th percentile are set to the value of the 99th percentile. Second, the same procedures has been applied to all observations smaller than the 5th percentile.

Overall, the outlier-corrected regression results can confirm the same results as per our original data set providing robustness to our findings. The models with outlier-corrected datasets have higher explanatory power with regards to the financial stability and risk than the models without outlier correction, as indicated by the higher R-squared. The significance of the financial expertise coefficients of regional banks increases as the risk regressions indicate.

With regard to performance, all coefficients on financial expertise and a significant part on bank level retain their signs from the original regressions. Despite the outlier correction, the coefficients in the ROE and RORWA regression outcomes remain insignificant.

A comparison with the coefficients of the outlier-corrected data set underlines our initial findings. There is neither a change in the signs of the expertise coefficients nor a material difference between the original panel and the merger-adjusted panel due to the outlier corrections compared to the original regressions.

Conclusion

The present study examines the influence of financial expertise of supervisory board members on a bank's risk-return profile based on German cooperative banks during the period 2004–2009. Our analysis demonstrates that financial experts in supervisory boards impact the risk-return profile. The risk-return trade off does not work for regional banks in which an increase in performance is associated with an increase in risk. The results are remarkably since financial expertise leads to greater risk-taking, measured as NPL ratio. However, we do not find evidence that financial expertise increases bank performance. The results indicate that cooperative banks are not able to benefit from financial experts. These findings are confirmed with a merger-controlled data set of the largest 150 banks without merger activities and outlier-corrected robustness checks.

Boards of cooperative banks are characterized by a large fraction of self-employed people, making up 40% of the total supervisory board population. In contrast, self-employed individuals represent less than 13% of the supervisory board in savings banks.

Interestingly, entrepreneurs do not exert a positive influence on the bank performance. Based on their profession and background this group of individuals is supposed to have a solid knowledge and distinctive awareness of business selection and risk-taking. This phenomenon can be explained by a portion of overconfidence with a self-attribution bias where

people tend to ascribe any success they in some activity to their own abilities and talents (Barberis and Thaler, 2003). Odean (1998) demonstrates that the greater the expertise individuals have, the more overconfident they tend to be. Further support is exhibited by the analysis of Ditttrich et al. (2005) showing that overconfidence is positively related to the task complexity.

Employed people with an average value of 50% of the total supervisory board represent a large fraction and notable reservoir of financial expertise. Insiders and politicians play a minor role representing 5% and 3% respectively of the board members. Therefore, there is hardly any change between the results for insider and outsider financial expertise.

From a regulator's perspective the results provide evidence that the prescription of universal financial expertise in bank's internal governance mechanisms does not lead to the desired effect of increasing the stability of the banking system. Our findings suggest that the Act to Strengthen Financial Market and Insurance Supervision is not necessarily contributing to an enhancement of banking system stability as it was intended to. However, we do not compare the composition of financial expertise in supervisory boards before and since the introduction of the new German regulation. This unresolved question could provide a promising avenue for future research. In addition, our findings leave the research question what the optimal threshold of the board composition with regards to financial expertise and board size is in order to increase the stability of the banking system.

Endnotes:

[1] Strong bank boards are characterized as boards representing more of bank shareholders interest.

[2] The full dataset comprises 39,365 data points of 257 cooperative banks and 209 savings banks at the individual level of the supervisory board members.

[3] We compare the supervisory board composition of the largest 200 cooperative banks with the 200 largest savings banks as of the end of 2009. The ratio of employed individuals in savings banks is more than 73%, whereas self-employed individuals represent less than 13% of the supervisory board.

[4] We find 40% self-employed individuals in supervisory boards of cooperative boards, whereas in savings banks the ratio of self-employed individuals to all board members is less than 13%.

References:

1. Acharya, V., Richardson, M., van Nieuwerburgh, S. and White, L. J. (2011), *Guaranteed To Fail: Fannie Mae, Freddie Mac and the Debacle of Mortgage Finance*, Princeton University Press., Princeton.
2. Acharya, V. and Yorulmazer, T. (2007), "Too many to fail - An analysis of time-inconsistency in bank closure

- policies", *Journal of Financial Intermediation*, Vol. 16 No. 1, pp. 1-31.
3. Adams, R., Almeida, H. and Ferreira, D. (2005), "Powerful CEOs and their impact on corporate performance", *Review of Financial Studies*, Vol. 18, pp. 1403-1432.
 4. Adams, R. B. and Mehran, H. (2008), *Corporate performance, board structure, and their determinants in the banking industry*, Staff Reports, No. 330. Federal Reserve Bank of New York, New York.
 5. Aebi, V., Sabato, G. and Schmid, M. (2012), "Risk management, corporate governance, and bank performance in the financial crisis", *Journal of Banking & Finance*, Vol. 36 No. 12, pp. 3213-3226.
 6. Altunbas, Y., Evans, L. and Molyneux, P. (2001), "Bank Ownership and Efficiency", *Journal of Money, Credit and Banking*, Vol. 33 No. 4, pp. 926-954.
 7. Altunbas, Y., Manganelli, S. and Marques-Ibanez, D. (2011), "Bank risk during the great recession: Do business models matter?", ECB Working Papers Series.
 8. Ard, L. and Berg, A. (2010), "Bank Governance - Lessons from the Financial Crisis", *World Bank, Policy Briefs, Note No. 13*, The World Bank, Washington D.C.
 9. Ayadi, R., Llewellyn, D. T., Schmidt, R. H., Arbak, E. and Groen, W. P. D. (2010), "Investigating Diversity in the Banking Sector in Europe - Key Developments, Performance and Role of Cooperative Banks", *Center for European Policy Studies*, Brussels.
 10. BaFin and Deutsche Bundesbank (2010), "Merkblatt zur Kontrolle von Mitgliedern von Verwaltungs- und Aufsichtsorganen gemäß KWG und VAG" [Online], available at: http://www.bafin.de/cln_152/nn_721290/SharedDocs/Veroeffentlichungen/DE/Service/Merkblaetter/mb_100222_Verwaltungs_und_Aufsichtsorgane.html?__nnn=true [Accessed 04 July 2015].
 11. Barberis, N. and Thaler, R. (2003), *A survey of behavioral finance*, Elsevier, Amsterdam.
 12. Barth, J. R., Caprio, G. J. and Levine, R. (2008), *Bank Regulations Are Changing: For Better or Worse?*, World Bank Policy Research, Working Paper Series, no. 4646. The World Bank, Washington D.C.
 13. Beck, T., Hesse, H., Kick, T. and Westernhagen, N. v. (2009), "Bank Ownership and Stability: Evidence from Germany", *FDIC - Center for Financial Research*.
 14. Beck, T., Levine, R. and Loayza, N. (2000), "Finance and the sources of growth", *Journal of Financial Economics*, Vol. 58 No. 1, pp. 261-300.
 15. Berger, A. N., Clarke, G. R. G., Cull, R., Klapper, L. and Udell, G. F. (2005), "Corporate governance and bank performance: A joint analysis of the static, selection, and dynamic effects of domestic, foreign, and state ownership", *Journal of Banking & Finance*, Vol. 29 No. 8-9, pp. 2179-2221.
 16. Berger, A. N., Kick, T. and Schaeck, K. (2012), "Executive board composition and bank risk taking", *Journal of Corporate Finance*, Vol. 28, pp. 48-65.
 17. Berger, H. and Nitsch, V. (2011), "Too Many Cooks? Committees in Monetary Policy", *Southern Economic Journal*, Vol. 78 No. 2, pp. 452-475.
 18. Bermig, A. and Frick, B. (2010), "Board Size, Board Composition, and Firm Performance: Empirical Evidence from Germany", Working Paper, University of Paderborn, Paderborn.
 19. Bertrand, M. and Schoar, A. (2003), "Managing with style: The effect of managers on firm financial policies", *Quarterly Journal of Economics*, Vol. 118, pp. 1169-1208.
 20. Bhattacharya, S., Boot, A. W. A. and Thakor, A. V. (1998), "The economics of bank regulation", *Journal of Money, Credit, and Banking*, Vol. 30 No. 4, pp. 745-770.
 21. Boyd, J. H. and Runkle, D. E. (1993), "Size and performance of banking firms: Testing the predictions of theory", *Journal of Monetary Economics*, Vol. 31 No. 1, pp. 47-67.
 22. Brown, C. O. and Dinç, I. S. (2011), "Too Many to Fail? Evidence of Regulatory Forbearance When the Banking Sector Is Weak", *Review of Financial Studies*, Vol. 24 No. 4, pp. 1378-1405.
 23. Carcello, J. V., Hollingsworth, C. W., Klein, A. and Neal, T. L. (2008), "Audit Committee Financial Expertise, Competing Corporate Governance Mechanisms, and Earnings Management in a Post-SOX World". University of Illinois 18th Symposium on Audit Research, Illinois.
 24. Choundhry, M. (2011), "Effective bank corporate governance: observations from the market crash and recommendations for policy", *Journal of Applied Finance & Banking*, Vol. 1 No. 1, pp. 179-211.
 25. Chuang, W.-I. and Lee, B.-S. (2006), "An empirical evaluation of the overconfidence hypothesis", *Journal of Banking & Finance*, Vol. 30 No. 9, pp. 2489-2515.
 26. Cihák, M. and Hesse, H. (2007), "Cooperative Banks and Financial Stability". Working Paper Series, International Monetary Fund, Washington D.C.
 27. Cunningham, L. A. (2008), "Rediscovering Board Expertise: Legal Implications of the Empirical Literature", *University of Cincinnati Law Review*, Vol. 77, p. 465.
 28. Davidson, W. N., Xie, B. and Xu, W. (2004), "Market reaction to voluntary announcements of audit committee appointments: The effect of financial expertise", *Journal of Accounting and Public Policy*, Vol. 23 No. 4, pp. 279-293.
 29. DeFond, M. L., Hann, R. N. and Hu, X. (2005), "Does the Market Value Financial Expertise on Audit Committees of Boards of Directors?", *Journal of Accounting Research*, Vol. 43 No. 2, pp. 153-193.
 30. Dell'Ariccia, G., Detragiache, E. and Rajan, R. (2008), "The real effect of banking crises", *Journal of Financial Intermediation*, Vol. 17 No. 1, pp. 89-112.
 31. Demirgüç-Kunt, A. and Huizinga, H. (2010), "Bank activity and funding strategies: The impact on risk and returns", *Journal of Financial Economics*, Vol. 98 No. 3, pp. 626-650.
 32. Dermine, J. (2003), "Banking in Europe: Past, present and future", Gaspar, V., Hartmann, P., Sleijpen, O. (Ed.), *Book, Banking in Europe: Past, present and future*, ECB, Frankfurt am Main.
 33. DeYoung, R., Hunter, W. C. and Udell, G. F. (2004), "The past, present, and probable future for community banks", *Journal of Financial Services Research*, Vol. 25 No. 2/3, p. 85.
 34. Dhaliwal, D. S., Naiker, V. and Navissi, F. (2006), "Audit Committee Financial Expertise, Corporate Governance and Accruals Quality: An Empirical Analysis". Working Paper, University of Arizona, Tucson.
 35. Diamond, D. W. (1991), "Monitoring and Reputation: The Choice between Bank Loans and Directly Placed Debt", *Journal of Political Economy*, Vol. 99 No. 4, pp. 689-721.

36. Diamond, D. W. and Rajan, R. G. (2001), "Liquidity risk, liquidity creation, and financial fragility: A theory of banking", *Journal of Political Economy*, Vol. 109 No. 2, pp. 287-327.
37. Dittrich, D. A. V., Güth, W. and Maciejovsky, B. (2005), "Overconfidence in investment decisions: An experimental approach", *The European Journal of Finance*, Vol. 11 No. 6, pp. 471-491.
38. Eisenberg, T., Sundgren, S. and Wells, M. T. (1998), "Larger board size and decreasing firm value in small firms", *Journal of Financial Economics*, Vol. 48 No. 1, pp. 35-54.
39. Farhi, E. and Tirole, J. (2012), "Collective Moral Hazard, Maturity Mismatch and Systemic Bailouts", *American Economic Review*, Vol. 102 No., pp. 60-93.
40. Fellner, G., Güth, W. and Maciejovsky, B. (2004), "Illusion of expertise in portfolio decisions: an experimental approach", *Journal of Economic Behavior & Organization*, Vol. 55 No. 3, pp. 355-376.
41. Fernandes, N. and Fich, E. M. (2009), "Does financial experience help banks during credit crises?", *IMD, Lausanne*.
42. Giammarino, R. M., Lewis, T. R. and Sappington, D. E. M. (1993), "An incentive approach to banking regulation", *The Journal of Finance*, Vol. 48 No. 4, pp. 1523-1542.
43. Goddard, J., Molyneux, P., Wilson, J. O. S. and Tavakoli, M. (2007), "European banking: An overview", *Journal of Banking & Finance*, Vol. 31 No. 7, pp. 1911-1935.
44. Güner, A. B., Malmendier, U. and Tate, G. (2008), "Financial expertise of directors", *Journal of Financial Economics*, Vol. 88 No. 2, pp. 323-354.
45. Harris, M. and Raviv, A. (2008), "A theory of board control and size", *Review of Financial Studies*, Vol. 21 No. 4, pp. 1797-1832.
46. Hasan, I., Schmiedel, H. and Song, L. (2012), "Returns to retail banking and payments", *Journal of Financial Services Research*, Vol. 41 No. 3, pp. 163-195.
47. Hau, H. and Thum, M. (2009), "Subprime crisis and board (in-)competence: private versus public banks in Germany", *Economic Policy*, Vol. 24 No. 60, pp. 701-752.
48. Hermalin, B. E. and Weisbach, M. S. (2003), "Boards of directors as an endogenously determined institution: a survey of the economic literature", *Economic Policy Review*, Apr, pp. 7-26.
49. Hoggarth, G., Reidhill, J. and Sinclair, P. (2004), "On the resolution of banking crises: theory and evidence", Working Paper No. 229, Bank of England, London.
50. Hopt, K. J. and Leyens, P. C. (2004), "Board Models in Europe - Recent Developments of Internal Corporate Governance Structures in Germany, the United Kingdom, France, and Italy", *European Company and Financial Law Review*, Vol. 1 No. 2, pp. 135-168.
51. Iannotta, G., Nocera, G. and Sironi, A. (2007), "Ownership structure, risk and performance in the European banking industry", *Journal of Banking & Finance*, Vol. 31 No. 7, pp. 2127-2149.
52. Jensen, M. C. (1993), "The modern industrial revolution, exit, and the failure of internal control systems", *The Journal of Finance*, Vol. 48 No. 3, pp. 831-880.
53. John, K. and Senbet, L. W. (1998), "Corporate governance and board effectiveness", *Journal of Banking & Finance*, Vol. 22 No. 4, pp. 371-403.
54. Jungmann, C. (2006), "The effectiveness of corporate governance in one-tier and two-tier board systems – Evidence from the UK and Germany", *European Company and Financial Law Review*, Vol. 3 No. 4, pp. 426-474.
55. Kaplan, S. N. (1994), "Top executives, turnover, and firm performance in Germany", *Journal of Law, Economics, & Organization*, Vol. 10 No. 1, pp. 142-159.
56. Kaufman, G. G. (2002), "Too big to fail in banking: What remains?", *The Quarterly Review of Economics and Finance*, Vol. 42 No. 3, pp. 423-436.
57. Kirkpatrick, G. (2009), "The corporate governance lessons from the financial crisis", *OECD Journal: Financial Market Trends*, Vol. 2009 No. 1, pp. 61-87.
58. Körner, T., Müller, O., Paul, S. and Schmidt, C. M. (2014), "Glas halb voll oder halb leer? Eine Analyse der Qualifikation von Kontrollorganmitgliedern deutscher Banken", *RWI Materialien*.
59. Kroszner, R. S., Laeven, L. and Klingebiel, D. (2007), "Banking crises, financial dependence, and growth", *Journal of Financial Economics*, Vol. 84 No. 1, pp. 187-228.
60. Laeven, L. and Levine, R. (2009), "Bank governance, regulation and risk taking", *Journal of Financial Economics*, Vol. 93 No. 2, pp. 259-275.
61. Lang, G. and Welzel, P. (1996), "Efficiency and technical progress in banking Empirical results for a panel of German cooperative banks", *Journal of Banking & Finance*, Vol. 20 No. 6, pp. 1003-1023.
62. Lee, Y. S., Rosenstein, S. and Wyatt, J. G. (1999), "The value of financial outside directors on corporate boards", *International Review of Economics & Finance*, Vol. 8 No. 4, pp. 421-431.
63. Levine, R. (1997), "Financial Development and Economic Growth: Views and Agenda", *Journal of Economic Literature*, Vol. 35 No. 2, pp. 688-726.
64. Levine, R. (2006), *Finance and Growth: Theory and Evidence*, Elsevier, Amsterdam.
65. Lipton, M. and Lorsch, J. W. (1992), "A modest proposal for improved corporate governance", *Business Lawyer*, Vol. 48 No. 1, pp. 59-77.
66. Malmendier, U. and Tate, G. (2005), "CEO overconfidence and corporate investment", *Journal of Finance*, Vol. 60, pp. 2661-2700.
67. Manne, H. G. (1965), "Mergers and the market for corporate control", *Journal of Political Economy*, Vol. 73 No. 2, pp. 110-120.
68. Manove, M. and Padilla, A. J. (1999), "Banking (conservatively) with optimists", *RAND Journal of Economics*, Vol. 30 No. 2, pp. 324-350.
69. Mehran, H., Morrison, A. and Shapiro, J. (2011), "Corporate governance and banks: What have we learned from the financial crisis?". Staff Reports, No. 502, Federal Reserve Bank of New York, New York.
70. Mercieca, S., Schaeck, K. and Wolfe, S. (2007), "Small European banks: Benefits from diversification?", *Journal of Banking & Finance*, Vol. 31 No. 7, pp. 1975-1998.
71. Minton, B. A., Taillard, J. P. A. and Williamson, R. (2010), "Do independence and financial expertise of the board matter for risk taking and performance?". Fisher College of Business Working Paper Series, 2010-03-014, Ohio State University, Columbus.
72. Odean, T. (1998), "Volume, volatility, price, and profit when all traders are above average", *The Journal of Finance*, Vol. 53 No. 6, pp. 1887-1934.
73. Pang, J. and Wu, H. (2009), "Financial markets, financial dependence, and the allocation of capital", *Journal of Banking & Finance*, Vol. 33 No. 5, pp. 810-818.

74. Pathan, S. (2009), "Strong boards, CEO power and bank risk-taking", *Journal of Banking & Finance*, Vol. 33 No. 7, pp. 1340-1350.
75. Peni, E. and Vähämaa, S. (2012), "Did good corporate governance improve bank performance during the financial crisis?", *Journal of Financial Services Research*, Vol. 41 No. 1-2, pp. 19-35.
76. Rajan, R. G. (1992), "Insiders and outsiders: The choice between Informed and Arm's-Length Debt", *The Journal of Finance*, Vol. 47 No. 4, pp. 1367-1400.
77. Rajan, R. G. and Zingales, L. (1998), "Financial dependence and growth", *The American Economic Review*, Vol. 88 No. 3, pp. 559-586.
78. Rosenstein, S. and Wyatt, J. G. (1990), "Outside directors, board independence, and shareholder wealth", *Journal of Financial Economics*, Vol. 26 No. 2, pp. 175-191.
79. Roy, A. D. (1952), "Safety first and the holding of assets", *Econometrica*, Vol. 20 No. 3, pp. 431-449.
80. Santos, J. A. C. (2001), "Bank capital regulation in contemporary banking theory: A review of the literature", *Financial Markets, Institutions & Instruments*, Vol. 10 No. 2, pp. 41-84.
81. Schmielewski, F. and Wein, T. (2012), "Are private banks the better banks? An insight into the principal-agent structure and risk-taking behavior of German banks", *Journal of Economics and Finance*, Vol. 39 No. 3, 518-540.
82. Spong, K. R. and Sullivan, R. J. (2010), "Bank ownership and risk taking: Improving corporate governance in banking after the crisis", *Federal Reserve Bank of Kansas City*.
83. Stein, J. C. (2002), "Information production and capital allocation: Decentralized versus hierarchical firms", *The Journal of Finance*, Vol. 57 No. 5, pp. 1891-1921.
84. Swan, P. L. and Forsberg, D. (2014), "Does board "independence" destroy corporate value", Working Paper.
85. Walker, D. (2009), "A review of corporate governance in UK banks and other financial industry entities: Final recommendations.", *The Walker Review Secretariat*, London.
86. Wallison, P. J. (2009), "Cause and effect: Government policies and the financial crisis", *Critical Review*, Vol. 21 No. 2-3, pp. 365-376.
87. Westman, H. (2011), "The impact of management and board ownership on profitability in banks with different strategies", *Journal of Banking & Finance*, Vol. 35 No. 12, pp. 3300-3318.
88. Wintoki, M. B., Linck, J. S. and Netter, J. M. (2012), "Endogeneity and the dynamics of internal corporate governance", *Journal of Financial Economics*, Vol. 105 No. 3, pp. 581-606.
89. Yermack, D. (1996), "Higher market valuation of companies with a small board of directors", *Journal of Financial Economics*, Vol. 40 No. 2, pp. 185-211.
90. Zhou, C. (2010), "Are banks too big to fail? Measuring systemic importance of financial institutions", *International Journal of Central Banking*, Vol. 34 No. 6, pp. 205-250.