The impact of management and board ownership on profitability in banks with different strategy

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Abstract

The characteristics of the agency problem are different in traditional, diversified and non-traditional banks. The deposit insurance reduces the incentives to monitor traditional and diversified banks, whereas non-traditional banks are more difficult to monitor due to greater opacity. Hence, the impact of ownership characteristics, which are used as corporate governance mechanisms, is expected to differ across banks with different strategy. Using a sample of listed and unlisted banks from 37 different European countries I do find that the impact of management and board ownership on profitability differ with the strategy of the bank, Management ownership has a positive impact on profitability in non-traditional banks, whereas board ownership has a positive impact on profitability in traditional banks. Management, rather than board ownership, appear to improve the profitability of diversified banks. Managers do, however, improve the profitability by increasing the risk of the operations. These findings support the idea that management ownership is important in banks which are difficult to monitor due to greater opacity and that board ownership is important in banks where government guarantees reduce the incentives to monitor.

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1   INTRODUCTION

A bank can be categorised as having one of three different strategies, i.e. as being a traditional, a non-traditional or a diversified bank. A traditional bank focuses on taking deposit and issuing loans, whereas the main source of income for a non-traditional bank is commissions and fees from e.g. securities trading, wealth management and underwriting. A diversified bank combines these two types of banking operations and hence has a balanced portfolio of traditional and non-traditional banking operations.

The severity and characteristics of the agency problem depend on the strategy of the bank. On one hand, the incentives and ability to monitor the operations vary with the strategy of the bank. The reduced incentives of monitoring due to the deposit insurance or too-big-to-fail (TBTF) government guarantee differ with the level of deposits and size of the bank (Merton (1977), O'Hara & Shaw (1990)). Banks are seen by many as more opaque than other companies making it difficult for outsiders to monitor the operations (see e.g. Morgan (2002)). The level of opaqueness does, however, differ with the operational characteristics of the bank (Flannery *et al.* (2004)), Iannotta (2006)). On the other hand, whether agency costs arise due to a conflict of interest between management and shareholders with respect to risk or due to the extraction of private benefits by the management, also vary with the strategy of the bank.

Due to the differences in the severity and characteristics of the agency problems, I expect that the impact of ownership characteristics, which are used as corporate governance mechanisms, vary with the strategy of the bank. While Denis *et al.* (1997)) study the impact of management and blockholder ownership on the performance of diversified industrial companies, the ownership and diversification literature has not been combined before to study the issue in a banking context. Thus, objective of this study is to determine whether the impact of management and board ownership on profitability is different in traditional, non-traditional and diversified European banks.

Previous ownership studies have focused on the impact of type of bank (see Altunbas *et al.* (2001) Iannotta *et al.* (2007)), state ownership (see La Porta *et al.* (2002), Berger *et al.* (2005), Micco *et al.* (2007)), foreign ownership (see Berger *et al.* (2005), Lensink *et al.* (2008), Staikouras *et al.* (2008)) and blockholder ownership (Caprio *et al.* (2007), Laeven & Levine (2008)) on bank performance. DeYoung *et al.* (2001) is the first study to examine the impact of the level of management and board ownership on bank efficiency. Whereas the study of DeYoung *et al.* (2001) is done on a sample of small US banks, this study uses a sample of both

listed and unlisted European banks, hence assessing whether the findings of DeYoung *et al.* (2001) can be generalised to a broader banking setting. By separating management and board ownership, I address the criticism presented in Demsetz & Villalonga (2001) that many studies on the impact of management ownership has included board ownership in the management or insider ownership variable even though the interests of the management and board are different.

Using a sample of listed and unlisted banks from 37 different European countries, I find that the impact of management and board ownership on profitability varies with the strategy of the bank. More precisely, I find that management ownership has a positive impact on the profitability of non-traditional banks and that board ownership has a positive impact on the profitability of traditional banks. Management ownership does, however, not have a significant impact on risk-adjusted profitability, a finding which suggests that greater profitability is achieved by increasing the risk of the operations. The results are robust to a number of model specification alterations addressing in particularly the endogeneity issue common in ownership studies and the sample selection bias issue common in diversification studies.

2   DIFFERENT STRATEGIES IN BANKS

The traditional role of banks has been to channel funds by taking short-term deposits from a large number of investors and issue long-term loans to a more limited number of agents in need of capital hence creating liquidity in the financial system (Diamond & Dybvig (1983)). Alongside the traditional banks, investment banks and mutual fund companies operate in securities trading, wealth management and underwriting, i.e. in non-traditional commissions and fee generating banking operations. Until the late 1990s US banks were prohibited by the Glass–Steagall Act to operate in other than traditional banking operations. The Gramm–Leach–Bliley Act has enabled Financial Holding Companies in the US to operate in a broader range of business areas since 1999. Traditional banks have utilised this opportunity by seeking new income streams within these commission- and fee-generating banking operations (Allen & Santomero (2001), Shyu & Reichert (2002)). European banks have been able to operate in wealth management, securities trading or investment banking since 1989, when the Second Banking Coordination Directive came into force. Hence, diversified banks, active both in traditional and non-traditional banking operations, have a longer tradition in Europe than the US.

Traditional, non-traditional and diversified banks tend to differ in terms of profitability and risk. When assessing the impact of increased focus on non-traditional banking operations it appears as potential profitability gains are outweigh by increased risk. Stiroh (2004a) find that increased reliance on non-traditional banking operations, in particularly, trading operations, reduce the risk-adjusted profitability of banks. It is in particularly the increased risk in non-traditional banking operations that drive his result; DeYoung & Roland (2001) and Stiroh (2006b) present empirical evidence that fee-based operations such as investment banking, securitisation income and trading are particularly volatile banking operations. DeYoung & Roland (2001) argue that the difference in risk is due to differences in the characteristics of the customer relationships; traditional banking operations are build on long term customer relationships, which increase the information and switching costs, whereas non-traditional banking operations are likely to be based on less stable customer relations as informational costs are low and competition is fierce.

Moreover, diversified banks appear to be less profitable than focused banks, in particularly in terms of risk-adjusted profitability. In a sample of small US community banks, Stiroh (2004b) finds that, when measured as risk-adjusted profitability, there is little benefits from diversification across unrelated banking activities, whereas there are some benefits from diversification across related banking activities such as across different loan classes. He concludes that diversification is beneficial only as long as the managerial skills and capacity are sufficient to manage an increasing mix of business activities. Similarly, Goddard *et al.* (2008) find that diversification has a negative impact on both the unadjusted and risk-adjusted profitability of small US credit unions. They do, however, not find a negative and significant connection between diversification and profitability among large US credit unions. Stiroh & Rumble (2006) contribute to the understanding of impact of bank strategy on profitability and risk by separating between the impact of diversification and increased focus on non-traditional banking operations. They find that there is a positive impact of diversification on the profitability of U.S. financial holding companies (FHCs), but that the benefit is offset by the negative impact of increased risk of non-traditional banking operations. Using a similar methodology on a sample of very small European banks, Mercieca *et al.* (2007) find that there is no benefit of diversification and that increased reliance on non-traditional banking operations has a negative impact on risk-adjusted profitability.

Finally, the choice of strategy has implications for the market value of a bank. Laeven & Levine (2007) find that diversified banks trade at a discount (the size of the diversification discount is smaller than the one documented by e.g. Lang & Stulz (1994) for industrial companies). This finding agrees with the notion that the increase in agency costs frequently outweighs the cost

efficiency gains that can be realised through diversification (Santomero & Eckles (2000)). With respect to the impact of increased focus on non-traditional banking operations, the findings presented on US and European samples diverge. Stiroh (2006a) find no connection between non interest income exposure and market returns among traded US BHCs, whereas increasing focus on non interest income appear to have a positive and significant impact on market return volatility. Baele *et al.* (2007), on the other hand, find that listed European banks that rely more on non-traditional banking operations have a greater franchise value. Moreover, they find a non-linear relation between reliance on non-traditional banking operations and total risk, a finding which support the notion that diversification reduces risk.

3   AGENCY COSTS IN BANKS

3.1.   Characteristics of the agency problem

The role of the government guaranteed deposit insurance is to reduce the risk of bank runs and thus increase the stability of the financial system (Diamond & Dybvig (1986)). The negative effect of deposit insurance is that the incentive for depositors to monitor banks is reduced as the deposit insurance covers potential losses to the depositors (Levine (2004)). Note that in addition to the explicit deposit insurance, there is belief among depositors that the government will cover a greater amount of deposits than is required by law in case of bank failure. Whether or not depositors have the incentives to monitor banks have the greatest impact on banks where deposits stand for a substantial part of the funding, hence reducing the importance of other debt holders and equity holders. This is presumably the situation in traditional banks.

The implicit guarantee that the government will bail-out banks which are seen as too-big-to-fail (TBTF) as the stability of the whole financial system otherwise would be jeopardised, will reduce the incentives to monitor them (O'Hara & Shaw (1990)). In effect, a large diversified bank has an insurance coverage for all its liabilities, not only the deposits covered by the explicit deposit insurance (Deng *et al.* (2007)), thus reducing the monitoring incentives of both depositors and other debt holders. Hence, I expect that the incentives to monitor due to the TBTF guarantee are lower in diversified banks than in focused banks.

The empirical evidence on whether banks would be more opaque than companies in other industries, thus making them more difficult to monitor, is inconclusive. The opaqueness do, however, appear to vary with the operational characteristics of the bank. Based on their findings on dispersion in analysts' forecasts and disagreement in bond ratings, Flannery *et al.* (2004)) and Iannotta (2006) suggest that the greater complexity of large, frequently diversified, banks

results in greater opaqueness and that a bank focusing on non interest income, i.e. non-traditional banking operations, is less opaque than other banks. Demsetz & Lehn (1985), on the other hand, argue that companies operating in an unstable business environment, thus plagued with high volatility in profits, are more difficult to monitor. Recall, that profit volatility increase with increased focus on non-traditional banking operations (DeYoung & Roland (2001) and Stiroh (2006b)), which following Demsetz & Lehn (1985) would indicate that these banking operations are more difficult to monitor. Moreover, non-traditional banking products are particularly complex. The nature of bank assets can be changed rapidly and the valuation, especially of off-balance sheet items, can fluctuate substantially, making it difficult for an outsider to assess a bank's risk. The increasing complexity and rapid development of new products and services have made it challenging even for regulatory and supervisory authorities to monitor non-traditional banking operations (Jones (2000)). Based on these arguments, I expect that non-traditional banks are more opaque and hence more challenging to monitor than traditional or diversified banks.

Management may engage in risk-shifting if they can benefit from the potential success, without bearing the risk of loss (Gorton & Rosen (1995)). For example incentives schemes that make managers focus on expected profits rather than risk, may result in a situation where risks beyond what shareholders, and in particular depositors and supervisors, would prefer are taken (Stiroh & Rumble (2006)). The deposit insurance increases the incentives for risk-shifting as it can be seen as a put option on the bank assets (Merton (1977)). There is no punishment on the management for engaging in risk-shifting activities, as the depositors do not have the incentive to price the increased risk of the deposits as it is not borne by them but rather by the government. Marcus & Shaked (1984)) show that the probability that a bank with great loan loss provisions take on high risk projects increases with the generosity of the deposit insurance system. Furthermore, the increased transaction orientation of banks has opened up new opportunities for cross-subsidisation from relatively low-risk relationship banking activities to more risky trading activities (Boot & Schmeits (2000)). Finally, opacity can also induce risk-shifting; e.g. too risky trading positions are not acknowledged in time due to inadequacies in internal monitoring mechanisms. Hence, the opaqueness of the operations enables management to capitalise on the option like incentive schemes. Thus I expect risk-shifting to be an agency problem occurring in banks regardless of their strategy.

Management may also be risk-averse, thus avoiding risky projects which would increase shareholder value. This is particularly likely when a substantial part of the management's personal wealth is concentrated in the bank (Sullivan & Spong (2007)). Risk-averse

management may implement a diversification strategy in order to reduce the risk of the bank with the underlying goal of risk reduction in the personal portfolio, or establish new business operations in order to secure their own position in the organisation, thus making sure that their undiversifiable human capital is utilised (Amihud & Lev (1981)). Hence, a diversification strategy may be implemented as a result of a risk-averse manager's actions, even though the decision is suboptimal for the bank.

Extraction of private benefits is more common in diversified than focused companies (Jensen (1986)). In addition to the reputational benefits of managing a large company, compensation size is frequently linked to company size, making growth through diversification an attractive strategy for managers (Jensen & Murphy (1990), Milbourn *et al.* (1999)). Furthermore, as a result of managerial overconfidence the perceived private benefits are overstated resulting in implementation of diversification strategies and M&A transactions, which will not even benefit the management (Milbourn *et al.* (1999)). One obstacle in implementing a diversification strategy is that the managerial skills and capacity are not sufficient to manage the diverse parts of the operations. In a banking setting, the differences in cultures, risk structures and compensation schemes used in traditional and non-traditional banking operations make the managerial challenges even greater. Goddard *et al.* (2004) find empirical support in a banking setting for the notion that management is inclined to pursue growth strategies on the expense of profitability.

3.2. Expected impact of management and board ownership[2]

Management ownership aligns the interests of the management and shareholders, thus reducing the agency costs (Jensen & Meckling (1976)). A few banking studies, which has addressed this issue, find that management ownership does have a positive impact on profitability. Garcia-Cestona & Surroca (2008) find that Spanish savings banks, which are controlled by insiders, i.e. employees, depositors and founders, focus more on profit maximisation than banks controlled by Public Administrations. As a result the insider controlled banks also perform better. Adams & Santos (2005) show that it is not only the cash-flow rights, but also the control rights, which work as incentives for management. They find that keeping own shares in trust, thus giving management the authority to use voting rights, but not giving them access to dividends, has a positive impact on bank performance. Using a sample of small US banks, DeYoung *et al.*

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[2] The theoretical and empirical guidance with respect to the expected impact of the ownership characteristics in banks with different strategy is limited as this study is one of the first to combine the ownership and diversification literature in a banking setting.

(2001) find that a bank can improve its profitability by hiring an outside manger provided that his interests are aligned to the ones of the shareholders through management ownership.

When it comes to the expected impact of management ownership across banks with different strategy, I rely on the notion presented in Demsetz & Lehn (1985); management ownership is of particular importance in companies that are difficult for outsiders to monitor. Thus, I expect to observe a positive impact of management ownership on profitability, in particular in the more opaque non-traditional banks.

Stulz (1988) models the relation between management ownership and company value and finds an inverted U-shape relation. In their model company value increases with management ownership until the management becomes a majority shareholder. This relation is due to nonlinearity in the relation between management ownership and risk taking behaviour. Initially management ownership does increase risk-taking; Saunders *et al.* (1990) and Sullivan & Spong (2007) find that banks with management ownership have higher level of risk than banks without management ownership. As the ownership level increases, a greater share of the managers' total wealth is presumable tied to the bank. With undiversified portfolio holdings, the manager is less willing to take on risky projects, which reduces expected profits (Sullivan & Spong (2007)). DeYoung *et al.* (2001) find support for this theoretical model in a banking setting as they report an inverted U-shaped relation between management ownership and profit efficiency in small US banks with hired management (the relation peaks at a 17%).

The guidance when it comes to differences in the expectations on finding the inverted U-shape relation in banks with different strategies is limited. We do know that the decision to implement a diversification strategy is seen as one example of risk-averse behaviour (Amihud & Lev (1981)). Furthermore, Denis *et al.* (1997) report a diversification discount among industrial companies when the management ownership is less than 10% or greater than 20%, which support the notion that management ownership is of value in diversified companies only in a limited range. Thus, I expect that the inverted U-shaped relation between management ownership and profitability is more pronounced in diversified banks than in traditional and non-traditional banks.

A monitor that is entitled to part of the success of the company has a greater incentive to be effective (Alchian & Demsetz (1972)). I expect this to hold in particularly for the closest monitor, the board. Denis (2001) notes that companies restructuring the board often require that board members have ownership in the company. Another aspect of board ownership is that large shareholders, who also tend to be effective monitors, exercise their power through a board

membership (Hermalin & Weisbach (2003)). Using a sample of takeovers in the UK, Cosh *et al.* (2006) find support for this notion; board ownership appear to have a positive impact on the operating performance of the company involved in a takeover. In a banking setting, DeYoung *et al.* (2001) report that greater (and more concentrated) board ownership is more common in banks with high profit efficiency. Moreover, Sullivan & Spong (2007) find that the distance to default in a bank is greater if a board member monitor has a substantial share of his wealth concentrated in the bank. Finally, I note that Adams & Ferreira (2007) argue that a management-friendly board, in contrast to an independent board without ownership in the bank, has a positive impact on performance. Thus, I expect that board ownership has a positive impact on the effectiveness of bank boards, and hence also on the profitability of banks.

Based on previous banking literature, I am not able to determine whether board ownership would be more valuable in a bank with a particular strategy. I do, however, want to test the notion that greater incentives to monitor for the board is of greatest value when deposit insurance and "too-big-to-fail" government guarantees reduce the monitoring incentives of depositors and other debt holders. Hence, I expect the positive impact of board ownership to be more pronounced in traditional and diversified banks than in non-traditional banks.

3.3. Summary

The different characteristics of the agency problem and the expected impact of management and board ownership on the profitability of banks with different strategy are summarised in Table 1.

[Insert Table 1 about here]

4 METHODOLOGY

4.1. Data

I study listed and unlisted banks from 37 European countries. The sample includes Bank Holding Companies (BHCs), commercial and investment banks. Savings and cooperative banks are not included as ownership stakes are rarely held by the management or board in these banks. Financial and ownership data is retrieved from the BankScope International Bank Database, which is provided by Fitch/Bureau Van Dijk. I restrict the financial data to consolidated financial statements in order to bring the perspective as close to the ultimate owners as possible. More importantly, this approach ensures that non-traditional banking operations frequently held

in subsidiaries are included in the financial data used. Furthermore, the legal selection bias in operating as a subsidiary or branch network abroad is eliminated. The use of consolidated data also brings the analysis closer to the real economic situation faced by owners and managers; Stiroh & Rumble (2006) argue that one can presume that strategic decisions are made with the entire operation in mind. The use of consolidated financial statements does, however, impose a risk of multiple counting of entries of the same organisation at different level of consolidation[3]. Hence, I impose a cap on institutional ownership and exclude banks which are majority owned by another European bank assumed to be included in the database. Observations with a non interest income to total operating income ratio, which is one of the cornerstones of the strategy variables, is not within the 0 to 1 range and with extreme values, i.e. observations outside the 5% and 95%, in the main profitability variable, return on equity, are excluded from the sample. I start with 1534 bank-year observations for active BHCs, commercial and investment banks with matched consolidated financial statement and ownership data for a particular year. 466 observations are dropped due to the restriction on majority ownership of another European bank, reducing the sample to 1068 observations. Of these observations 167 are regarded as outliers, leaving me with a sample of 901 bank-year observations for 492 European banks. There are 64 BHCs, 374 commercial and 54 investment banks in the sample. One third of the banks are listed. More than three out of four banks are headquartered in a Western European country, but 58 Eastern European and 75 Russian or ex-Soviet state banks are also included in the sample. With few exceptions the bank-year observations are from the years 2003 to 2006 (3% are from 2000, 2001 and 2002).

4.2.   Definition of variables

4.2.1.   *Profitability variables*

When defining the profitability variables I rely on accounting data as both listed and unlisted banks are included in the sample. I include both return on equity, denoted as *ROE*, and return on assets, denoted as *ROA*, in the analysis. I regard *ROE* is as the main profitability variable is it is the one of most interest to shareholders. Noting the importance of risk in the banking sector and recalling that increased returns are typically associated with increased risk, risk-adjusted profitability variables are also used as dependent variables. To this end *ROE* and *ROA* are divided by the three year standard deviation in the respective profitability variable. These variables are denoted *ROE_RA* and *ROA_RA*. When the risk-adjusted profitability variables are

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[3] This issue has been raised by e.g. Bonin *et al.* (2005), Micco *et al.* (2007).

used, observations of banks with recent M&A activity, of which a substantial change in assets is an indication, are excluded from the sample. Following, Baele et al. (2007), the annual change in assets over the past two years is seen as substantial if it is less than -5% and greater than 30%.

4.2.2. Ownership variables

When it comes to the ownership variables both dummy variables for the existence of a particular type of owner as well as continuous variables for the level of ownership are included in the model specification.[4] Management ownership, denoted *MGT*, is a dummy variable taking the value one if at least one of the eight owners or ownership groups included in the BankScope database is a member of the management team or labelled as "management" and zero otherwise. Similarly, *BOARD* is a dummy variable taking the value one if at least one of the named private individual owners is a member of the board of directors and zero otherwise. The continuous variables are the total management ownership percentage, *MGT%*, and the total board ownership percentage, *BOARD%*, respectively. Recalling that the impact of management ownership is expected to be nonlinear, I also a squared *MGT%*. This variable is denoted $MGT\%^2$.

4.2.3. Strategy variables

Following the approach taken in previous diversification studies, I base the definition of strategy variables on two ratios; non interest income to total operating income and other earning assets than loans to total earnings assets. The latter ratio includes off balance sheet items. As there are some concerns with both ratios[5], I choose to combine the two (Laeven & Levine (2007) use a similar method in robustness tests). This procedure also reduces the noise of using only one bank-year observation of the ratio instead of averaging the ratio over several years. Hence, I calculate the average of the non interest income to total operating income ratio and other earning assets than loans to total assets ratio taking into account off-balance sheet items for each bank-year observation and use the average to categorise the bank-year observations as being

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[4] The categorisation of the owners has required some manual work. In the BankScope database an owner can for example be categorised as "Management and employees". The number of owners in this category is, however, negligible. Hence, I have cross-checked the names of the owners categorised as "Individuals and families" with information on the individuals on the management team and board of directors found on the company home pages and annual reports. As a result these two categories have been recoded as "Management", "Board", "Employees" and "Private".

[5] Net rather than gross interest income is available. Assets categorised as being traditional, such as loan, generate fee income, whereas securities categorised as being non-traditional generate interest income. Furthermore, traditional banking operations such as ATM and safety deposit box operations generate fees (Stiroh (2004b), Laeven & Levine (2007), Baele *et al.* (2007)).

from a traditional, diversified or non-traditional banks. I base the selection of the cut-off points on Laeven & Levine (2007), where highly diversified banks are defined as banks with the non interest income to total operating income ratio or other earning assets to total earnings assets in the range of 1/3 and 2/3.[6] Thus the dummy variable for traditional banks, *TRAD*, takes the value one if the average ratio is less than 1/3 and zero otherwise, the dummy variable for diversified banks, *DIV*, takes the value one if the average ratio is within the range of 1/3 and 2/3 and zero otherwise, and the dummy variable for non-traditional banks, *NONTRAD*, takes the value one if the average ratio is higher than 2/3 and zero otherwise. Note that the bank-year observation is dropped if the non interest income to total operating income ratio and the other earning assets to total assets ratio give very controversial results, i.e. when one ratio indicates that the bank is traditional at the same time as the other indicate that it is non-traditional, and visa verse.

4.2.4. *Control variables*

A number of banks specific control variables are included in the model specification to ensure that the strategy variables stand for differences in monitoring incentives and ability as well as risk-shifting incentives rather than differences in operational characteristics. First, I account for differences in bank size, which may have a positive impact on profitability due to economies of scale. The findings on existence of economies of scale in a banking context are, however, inconclusive (Berger & Humphrey (1997)). The more complicated management structure, with an increasing number of managerial layers, may reduce the efficiency of large banks (Williamson (1967)). Size do, however, appear to affect funding costs. Larger banks may have lower cost of funding due to better risk diversification opportunities (McAllister & McManus (1993)). moreover, Hughes & Mester (1993) show that large banks pay a lower price on uninsured deposits due to the TBTF government guarantee. Bank size is measured as the natural logarithm of total assets and denoted as *SIZE*. Second, I account for differences in funding costs. Banks with a high level of deposits to total funding have access to low cost funding that can be seen as subsidised funding due to the governmentally regulated deposit insurance. Furthermore, a well capitalised bank is associated with less risk as the probability for financial distress and bankruptcy is smaller, hence reducing the funding costs (Berger (1995)). The equity to asset ratio has also been used as a proxy for management risk preferences as banks with risk-loving managers tend to have lower equity ratios (Hughes & Mester (1998)). Hence, the total deposits

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[6] I select these cut-off points rather than the 10% and 90% cut-off points used in the main analysis in Laeven & Levine (2007) in order to create three sub-samples of comparable size.

to total funding ratio, denoted *DEPOSITS*, and the total equity to total asset ratio, denoted as *EQUITYASS*, are included in the model specification.[7]

Institutional and environmental factors such as the regulatory environment, the level of economic and technological development, and the structure of the financial system, e.g. whether it is bank-based or market-based, the level of competition from other financial intermediaries as well as from capital markets, the level of consolidation, the level of product and service innovation in the financial markets have great impact on the ability of the bank to generate profits. These differences are accounted for by including country dummy variables (*COUNTRY*) in the model specification, with the modification that countries are grouped with a neighbouring country if there are less than 10 bank-year observations from the particular country. In addition, year dummy variables (*YEAR*) are included in the model specification to capture time-varying factors in the data.

Table 2 summarises the variables used and lists the expected impact of each variable on profitability.

[Insert Table 2 about here]

4.3.   Model specification

In the baseline model specification, I examine the impact of an ownership variable on the profitability of a bank (see Equation (1)). The profitability variable *PROF* is either *ROE*, *ROA*, *ROE_RA* or *ROA_RA*, whereas the ownership variable *OWN* is either *MGT*, *MGT%*, *BOARD* or *BOARD%*[8]. The vector *BANK* includes the bank-specific control variables *SIZE*, *DEPOSITS* and *EQUITYASS*, the vector *COUNTRY* includes the country dummy variables and the vector *YEAR* includes the year dummy variables.

$$PROF_{i,t} = \alpha + \beta_1 * OWN_{i,t} + \beta * \left[BANK_{i,t}\right]$$
$$\cdot + \beta * \left[COUNTRY_{i,t}\right] + \beta * \left[YEAR_{i,t}\right] + \varepsilon_{i,t} \tag{1}$$

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[7] These bank specific control variables have been used in previous diversification studies (see e.g. Stiroh & Rumble (2006), Laeven & Levine (2007), Baele *et al.* (2007)). In addition, the standard deviation in income or profitability over a number of years has been included as a measure of risk. Unfortunately, the availability of time series data is limited and such a variable would hence reduce the sample size significantly. Similarly, lagged profitability is not included in the main model specification to account for performance persistence nor is indicators of growth.

[8] Management and board ownership is analysed separately to keep the presented results simpler. The results do, however, remain when the ownership variables are included in the model specification simultaneously.

In order to be able to study the impact of an ownership characteristic on the profitability of a bank with a particular strategy, I include interaction terms in the model specification (see Equation (2)). The interaction terms with the strategy variables *DIV* and *NONTRAD*, pick up the additional impact of the particular ownership type in diversified and non-traditional banks when comparing to the impact in the reference group of traditional banks.

$$
\begin{aligned}
PROF_{i,t} = \alpha &+ \beta_1 * OWN_{i,t} + \beta_2 * OWN_{i,t} * DIV_{i,t} + \beta_3 * OWN_{i,t} * NONTRAD_{i,t} \\
&+ \beta_4 * DIV_{i,t} + \beta_5 * NONTRAD_{i,t} + \beta * [BANK_{i,t}] \\
&+ \beta * [COUNTRY_{i,t}] + \beta * [YEAR_{i,t}] + \varepsilon_{i,t}
\end{aligned} \tag{2}
$$

I use the model specification presented in Equation (3) to examine the nonlinearity of the relation between management ownership and profitability. Interaction terms cannot be used due to high multicollinearity in the model specification (VIF well above 20). Instead Equation (3) is run for sub-samples of banks with different strategy.

$$
\begin{aligned}
PROF_i = \alpha &+ \beta_1 * MGT\%_i + \beta_2 * MGT\%^2_i + \beta_3 * DIV_i + \beta_4 * NONTRAD_i \\
&+ \beta * [BANK_i] + \beta * [COUNTRY_i] + \beta * [YEAR_i] + \varepsilon_i
\end{aligned} \tag{3}
$$

The main concern with the model specifications is potential endogeneity and sample selection bias. The level of profitability may trigger the selection of a particular ownership characteristic. For example, management or board members could be rewarded with shareholdings after a successful year. On the other hand, it is also possible that a poorly performing bank in need of drastic changes chooses to motivate the management with substantial ownership shareholdings. Moreover, the strategy variables are not necessary exogenous; previous years' profitability, the size of the bank and owner preferences may have an impact on the strategic choices. These challenges are addressed in the robustness tests presented in section 5.3, as is the sensitivity of the results to the definition of some of the variables, in particularly the strategy variables. It is rather difficult to address these issues in particularly due to the limited access to time series ownership data which would enable a change analysis. Therefore, I consider the simpler and straight-forward model specifications presented in this section more appropriate for the purpose of assessing whether the impact of management and board ownership varies across banks with different strategy.

5   EMPIRICAL EVIDENCE

5.1.   Descriptive statistics

When categorising the banks according to the strategy variables defined in section 4.2, I find that the sub-sample of traditional banks (*TRAD*) include 200 bank-year observations, the sub-sample of diversified banks (*DIV*) include the majority of the bank-year observations, i.e. 485, and the sub-sample non-traditional banks (*NONTRAD*) include 216 bank-observations (see Columns IX, XI and XIII in Table 3). Allied Irish Banks plc, Banco Popular Espanol SA, Danske Bank A/S, and Russian Agricultural Bank Group are examples of traditional banks, Barclays Plc, BNP Paribas, Commerzbank AG, Gazprombank Group, HBOS Pl, ING Groep NV, Kaupthing Bank hf, Nordea Bank AB and Zurich Bank are examples of diversified banks, and finally D. Carnegie & Co AB, Credit Suisse Group, Daiwa Securities Trust and Banking (Europe) plc, Deutsche Bank AG[9], and Julius Baer Holding Ltd are examples of non-traditional banks. There are some movement from one category to another over time, e.g. UBS AG is categorised as a diversified bank in 2003 and 2004, but as a non-traditional bank in 2005. The three different bank types are found in all categories, but commercial banks are overrepresented among traditional and diversified banks and BHCs and investment banks are overrepresented among non-traditional banks. About one third of the traditional and diversified banks are listed, whereas the share of listed banks is somewhat lower among the non-traditional banks. The great majority of banks in each category are headquartered in a Western European country. Among traditional and diversified banks about one third of the banks are headquartered in an Eastern European or ex-Soviet state country, whereas only 4% of the non-traditional banks are headquartered in an Eastern European or in Russia and ex-Soviet state country.

[Insert Table 3 about here]

Traditional and diversified banks are about the same *SIZE*, whereas non-traditional banks are significantly smaller (see "Bank specific control variables" in Table 3). Moreover, diversified banks have significantly higher *DEPOSITS* than the traditional banks. These two findings indicate that the banks in the sample do not fully meet the set expectations, i.e. that diversified banks would be larger than focused banks and that traditional banks would rely most on *DEPOSITS* as a source of funding. Hence, the expectations on the characteristics of agency problem as presented in Table 1 are refined; the TBTF guarantee is expected to have an impact

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[9] Deutsche Bank AG is very close to the cut-off point between diversified and non-traditional banks having an average ratio of the non interest income to total operating income ratio and other earning assets than loans to total assets ratio taking into account off-balance sheet items of 72%.

on the monitoring incentives not only in diversified banks, but also in traditional banks, and the incentives to monitor due to the deposit insurance are reduced, not only in traditional banks, but even more so in diversified banks. *EQUITYASS* is the highest in non-traditional banks, most probably due to higher needed (or required) buffers to offset the risk of high volatility in income and profit streams.

The average profitability is 12% when measured by *ROE* and 1.5% when measured by *ROA* (see "Profitability variables" in Table 3). The distribution of *ROE* is close to normal, whereas the distribution of *ROA* is somewhat skewed to the left. The regression results are, however, robust to a log transformation of *ROA*. The risk-adjusted profitability variables, *ROE_RA* and *ROA_RA*, both have an average of about 4.4 and are also slightly skewed to the left. When comparing the profitability across banks with different strategy, I find that the profitability differs with the strategy of the bank and that the difference varies with profitability variable. When measured with *ROE*, non-traditional banks appear to have significantly lower profitability than diversified banks, whereas non-traditional banks appear to have significantly higher profitability than traditional and diversified banks when profitability is measured by *ROA*. The significantly higher *EQUITYASS* may be one reason for the lower profitability of non-traditional banks when measured by *ROE*, but a size effect may also explain the finding as non-traditional banks are significantly smaller than traditional and diversified banks. Hence, the findings of this simplistic univariate analysis support the inclusion of *EQUITYASS* and *SIZE* as bank specific control variables in the model specification. Finally, the risk-adjusted profitability variables suggest that the risks taken by non-traditional banks are not necessarily justified by additional profits.

When it comes to the ownership characteristics, I find that that the frequency of management ownership (*MGT*) in the full sample is 12% (see "Ownership variables" in Table 3). The frequency of management ownership is, however, very different in the sub-samples of banks with different strategy. In non-traditional banks *MGT* is 19%, versus only about 10% in traditional and diversified banks (see Columns V, VII and XI). The level of direct management ownership (*MGT%*) also differs from one sub-sample to another. It is the highest in non-traditional banks and lowest in traditional banks. Thus, it appears as large management ownership shares are more common in diversified banks than in other banks. Finally, I note that about 10% of the banks have board ownership (*BOARD*). The average percentage of total board ownership (*BOARD%*) is less than 2% and there are no significant differences when comparing the sub-sample means.

5.2.   Regression analysis

I start the regression analysis by examining the impact of management ownership on profitability of banks without account for potential differences in their strategy, i.e. the baseline model specification defined in Equation (1) is used (see Column I to IV in Panel A of Table 4). I find that management ownership has a positive and significant impact on *ROE*. Recalling that the average *ROE* is 12%, a 1.7%-unit increase can be seen as economically significant. The impact of management ownership on *ROA* and the risk-adjusted profitability variables *ROE_RA* and *ROA_RA* is, however, not significant. Next, I consider whether the impact of management ownership depends on the strategy the bank has (see Column V to VIII). Management ownership does not appear to have a significant impact on *ROE* neither in the reference group of traditional banks nor in diversified banks (see joint F-tests of *MGT+MGT*DIV*=0). Management ownership does, on the other hand, have a significant positive impact on the profitability of non-traditional banks (see joint F-tests of *MGT+MGT*NONTRAD*=0). This finding supports the expectation that management ownership is beneficial when operations are difficult to monitor due to complexity in products and high volatility in income streams. The results are, however, sensitive to the profitability variable used; the impact of management ownership on *ROA* is significant only among diversified banks (see joint F-tests of *MGT+MGT*DIV*=0), which indicate that management ownership is beneficial when operations are difficult to monitor due to complexity in business model rather than complexity in products and where there are greater opportunities to extract private benefits. When the risk-adjusted profitability variables *ROE_RA* and *ROA_RA* are used as dependent variables, the results are no longer significant. This suggests that management with ownership improves the profitability of banks by increasing the risk-level of the operations.

I fail to find a positive connection between the level of direct management ownership and profitability, but do find that the level of direct management ownership has a negative and significant impact on risk-adjusted profitability *ROA_RA* (see Column I to IV in Panel B of Table 4). This negative relation is particularly severe in the reference group of traditional banks (see Column V to VIII). A word of caution is in place at this point; the number of observations with data on the level of direct management ownership is limited in the sub-sample of traditional banks, which may affect the results.

[Insert Table 4 about here]

In order to gain a better understanding of the impact of the level of direct management ownership on profitability, I examine whether the hypothesised inverted U-shape can explain

the failure to find a significant positive impact of level of direct management ownership on profitability. The results for the full sample suggest that an inverted U-shape is present; the coefficient for *MGT%* is positive and the coefficient for *MGT%²* is negative and significant when *ROE* is used as the dependent variable (see Column I of Table 5). When accounting for the different strategies by running the same model for sub-samples of banks with different strategy, I find an inverted U-shape relation between level of direct management ownership and *ROE* among non-traditional banks (see Column VII), but not among diversified banks. These findings contradict the expectation that the inverted U-shaped relation would be most pronounced in diversified banks. The limited number of traditional banks with data on the level of direct management ownership is most probably again behind the negative and significant sign of *MGT%* (see Column III).

[Insert Table 5 about here]

Next, I examine the impact board ownership on the profitability of banks (see Table 6). Board ownership does not appear to have an impact on profitability when differences in strategy are not accounted for (see Column I to IV in Panel A). As was the case with management ownership, the impact of board ownership on profitability does differ across banks with different strategy. The impact of board ownership is positive and significant in the reference group of traditional banks, whereas the positive coefficient is insignificant for diversified and non-traditional banks (see Column V and VI). The results are robust to whether *ROE* or *ROA* is used as dependent variable. This finding support the expectation that board ownership is most beneficial in banks where the monitoring incentives are reduced either due to the government guaranteed deposit insurance or TBTF implicit government guarantees. Board ownership appear to affect risk-adjusted profitability only among diversified banks; the impact on *ROA_RA* is negative and significant (see Column VII and VIII in Panel A).

The relation between the level of direct board ownership and profitability appear to have be negative; the relation is negative and significant when *ROA* and *ROA_RA* are used as dependent variables (see Column II to IV in Panel B of Table 6). The negative relation is particularly evident in diversified banks (see joint F-tests of *BOARD%+ BOARD%*DIV*=0 in Column V, VI and VIII[10]). This is in conflict with the expectation that greater incentives for the board would have a positive impact in banks where depositors have lower monitoring incentives.

[Insert Table 6 about here]

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[10] The results when ROE_RA is used as dependent variable appear to be driven by extreme outliers and are hence regarded as less reliable than when the other profitability variables are used.

The sample includes both listed and unlisted banks, in which the impact of the ownership characteristics examined may differ as the agency problems in listed and unlisted banks are different (see e.g. Loderer & Waelchli (2006)). Listed banks have to apply to stricter corporate governance rules. Furthermore, the market discipline and competitive pressure from equity markets push listed banks to improve bank performance. Financial targets and earnings guidance released by the bank put additional pressure to succeed on the management. Finally, the dual role of the board as both monitor of and advisors to the management may; i.e. the advisory role is expected to be more pronounced in smaller unlisted banks. Hence, internal corporate governance mechanisms are expected to be of lesser importance in listed than unlisted banks. However, when rerunning the regressions in sub-samples of listed and unlisted banks, the findings, in particularly for the impact of management ownership, contradict this expectation (see Panel A of Table 7). *MGT* has a positive impact on profitability in listed diversified and non-traditional banks, whereas the impact is insignificant in unlisted banks, regardless of their strategy. On the other hand, board ownership appear to have a positive impact on profitability both in listed and unlisted banks (see Columns II and III in Panel B), and the level of direct board ownership has a negative and significant impact on profitability in listed rather than unlisted diversified banks and a positive and significant impact in unlisted rather than listed non-traditional banks (see joint F-tests of *BOARD%+BOARD%*DIV*=0 and *BOARD%+BOARD%*NONTRAD*=0). The impact of management ownership on the profitability of traditional and non-traditional banks remain the same when only banks with an external blockholder owner with a direct ownership of more than 10% are included in the sample to address the potential implication of ownership concentration on the effectiveness of management and board ownership as corporate governance mechanisms (the results are not presented in table). The unexpected positive impact of management ownership in listed diversified banks is, however, no longer significant. The negative impact of level of direct board ownership on the profitability of both unlisted diversified and unlisted non-traditional banks do, on the other hand, become significant, a finding which again contradicts the expectation.

[Insert Table 7 about here]

Finally, a few words on the profitability of banks with different strategy as indicated by the strategy variables are in called for. Contrary to the finding presented in Laeven & Levine (2007), it appears as diversified banks would not be less profitable than focused banks, which may be an indication that European banks in the sample used in this study have been able to implement a diversification strategy more successfully than the banks in the international sample used by Laeven & Levine (2007). The finding that the unadjusted profitability of non-

traditional banks is significantly higher in non-traditional banks than in traditional and diversified banks is, on the other hand, in line with the findings presented in Stiroh & Rumble (2006) and Laeven & Levine (2007), whereas the finding that the risk-adjusted profitability of non-traditional banks appears to be significantly lower than the one in traditional and diversified banks are inline with the ones reported in Stiroh (2004a), Stiroh & Rumble (2006) and in Mercieca *et al.* (2007) on a sample of very small European banks. When the strategy variables are interacted with the ownership variables the significance of the strategy variables change; the interaction with the management ownership variable weakens the significance and the interaction with the board ownership variable strengthens the significance. These finding indicates that the results of previous diversification studies may be driven by differences in the ownership structure of the banks in the samples. Note, however, that the impact of diversification and increased focus on non-traditional banking operations are not separated.

5.3. Robustness test

The main objective with the robustness tests is to address the endogeneity and sample selection issue. This is done in a number of ways. First, I address the endogeneity of the ownership variables *MGT* or *BOARD* by applying Heckman (1979)'s two-step model.[11] I base the selection of variables used as determinants of ownership on Demsetz & Lehn (1985) and studies which have developed their seminal work. Demsetz & Villalonga (2001) argue that previous profitability is expected to have an impact on current ownership structure due to access to insider information and performance based compensation. Himmelberg *et al.* (1999), on the other hand, account for managerial discretion proxied by company size, capital intensity, cash flow, R&D intensity, advertising intensity and gross investment rates. Hence, both the previous year's profitability (*PROF(t-1)*) and size (*SIZE(t-1)*) are included in the first stage probit estimation of Heckman's two-step model (due to limited data availability, the other variables presented in Himmelberg *et al.* (1999) are not included). I am hesitant to include a traditional risk measure as proposed by Demsetz & Lehn (1985) as it would reduce the sample size drastically due to the limited access to time series data. Guided by the finding presented in DeYoung & Roland (2001) and Stiroh (2006b) that non-traditional banking operations are riskier than traditional banking operations, I include the continuous variable underlying the strategy variables in the first stage probit estimation. This ratio, denoted as *RISKOPER*, is the average of the non interest income to total operating income ratio and other earning assets than

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[11] Similar results are achieved when a two stage least square simultaneous equation model is applied where the same model specification is used to examine the determinants of management and board ownership, respectively, and whether the bank is diversified or not.

loans to total earning assets ratio taking into account off-balance sheet items. Moreover, I include the legal rights index (*RIGHTS*) as the ownership structure of banks is expected to vary across countries with different legal system. Maury (2006) uses a similar approach in order to account for the findings of the theoretical model presented in Shleifer & Wolfenzon (2002). Finally, I account for the fact that ownership characteristics may be rather stable over time and that management and board ownership preferences may have an impact on the ownership structure. Note also that e.g. de Andres & Vallelado (2008) use lagged board characteristics as instruments for current board characteristic. Hence, the lagged management and board ownership variables *MGT(t-1)* and *BOARD(t-1)* are included in the model specification. The first stage probit estimation model is presented in Equation (4). The second step equation is as in the original model specification defined in Equation (2).

$$OWN_{i,t} = \alpha + \beta_1 * PROF(t-1)_{i,t} + \beta_2 * SIZE(t-1)_{i,t} + \beta_3 * RISKOPER$$
$$+ \beta_4 * RIGHTS_{i,t} + \beta_5 * MGT(t-1)_{i,t} + \beta_6 * BOARD(t-1)_{i,t} + \varepsilon_{i,t} \quad (4)$$

Second, I follow Laeven & Levine (2007) in applying Heckman's two step model to control for sample selection bias in the strategy of the bank, in particularly whether it is diversified or not. Hence, the first step probit estimation include the previous year's profitability (*PROF(t-1)*) and size (*SIZE(t-1)*) and a dummy variable taking the value one of the bank is listed or not (*LISTED*)[12]. Once more, I account for ownership preferences by including the lagged management and board ownership variables *MGT(t-1)* and *BOARD(t-1)* in the first stage probit estimation model (see Equation (5)). The second step equation is as in the original model specification defined in Equation (2).

$$STRAT_{i,t} = \alpha + \beta_1 * PROF(t-1)_{i,t} + \beta_2 * SIZE(t-1)_{i,t} + \beta_3 * LISTED_{i,t}$$
$$+ \beta_4 * MGT(t-1)_{i,t} + \beta_5 * BOARD(t-1)_{i,t} + \varepsilon_{i,t} \quad (5)$$

Third, I apply a simultaneous equation system where the challenge with the ownership and strategy variables is addressed simultaneously[13]. Hence, both Equation (4) and (5) are included in the equation. The third equation in the system is as in the original model specification defined in Equation (2). Unfortunately the simultaneous equation system fails to correct for clusters in observations.

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[12] Laeven & Levine (2007) distinguish between whether the bank is included in the S&P financial index and whether the bank is listed on the NYSE and also include the share of diversified banks in the economy.

[13] For example Loderer & Martin (1997) use a simultaneous equations system to examine the relation between ownership characteristics and acquisition performance.

The general finding when the endogeneity and sample selection bias is accounted for when examining the impact of management ownership on profitability is that the positive impact in the sub-sample of non-traditional banks is robust (see joint F-tests of *MGT+ MGT*NONTRAD*=0 in Panel A of Table 8). Moreover, management ownership appear to have a positive impact on *ROE* in diversified banks when some model specifications are used (see joint F-tests of *MGT+MGT*DIV*=0 in Column VIII and XIV). The findings when profitability is measured by *ROA* is less robust; the positive impact of management ownership in diversified banks remain significant only when the simultaneous equation system is applied (see joint F-tests of *MGT+MGT*DIV*=0 in Column XI and XIV in Panel B). On the determinants of management owners, I do not find that the previous year's profitability would have a significant impact on whether a bank has management ownership or not. There is a significant relation between the other variables included in the model specification and management ownership; larger banks are less likely to have management ownership, whereas banks focusing on riskier non-traditional banking operations are more likely to have management ownership. Furthermore, management ownership is more frequent in countries with high legal protection of shareholders. When the previous year's ownership structure is included in the model specification, lagged management ownership drives the results. The results with respect to the determinants of diversification strategy are less encouraging; none of the variables are statistically significant with the exception of a negative impact of lagged management ownership on *ROE* in the simultaneous equation model (see Column XIII in Panel A).

[Insert Table 8 about here]

The positive and significant impact of board ownership on profitability whether it is measured by *ROE* or *ROA* among traditional banks is robust across model specifications (see Panel A and B of Table 9). The impact of board ownership on the profitability of non-traditional banks is negative and significant in some model specifications (see joint F-tests of *BOARD+ BOARD*NONTRAD*=0 in Column III in Panel A and Column XIII in Panel B). Finally, I note that only the size of the bank appear to have a significant impact on whether the bank has board ownership or not, i.e. larger banks are less likely to have board ownership. There is a positive and significant relation between the previous year's profitability and board ownership only in one model specification (see Column IX in Panel A).

[Insert Table 9 about here]

Apart from the endogeneity and sample selection bias issues, the main methodological challenge in this study lies in the definition of the strategy variables. The financial ratio used as

basis for the categorisation has an impact on which banks are categorised as being traditional, diversified or non-traditional As a result the sub-sample sizes vary (see Table 10). I rerun the regressions for the main profitability variables *ROE* and *ROE_RA* with the four alternative definitions of the strategy variables. The results of the regressions indicate that the results are sensitive to the way the strategy variables are defined (see Panel A of Table 11). The positive impact of management ownership on *ROE* in traditional banks remains significant when the first two alternative strategy variable definitions are applied. When the third definition is used management ownership has a positive impact on *ROE* in diversified banks rather than in non-traditional banks. Recall from Table 10 that the number of banks categorised as non-traditional in this specification is lower than when the other definitions are used, which indicate that some of the profitable banks with management ownership have been moved to the sub-sample of diversified banks in this categorisation. Moreover, the impact on *ROE_RA* remain insignificant, giving further support to the notion that management with ownership increases bank profitability by increasing the risk of the operations. The relation between the level of direct management ownership and *ROE* in traditional banks remain negative. It is significant when the first two alternative strategy variable definitions are applied. The main finding with respect to board ownership, i.e. that there is a positive connection to profitability in traditional banks is also sensitive to the strategy variable definitions; it only remain significant when the other average ratio of non interest income to total income and other earning assets to total earning assets excluding the impact of off balance sheet items is used (see Panel B). Finally, note that unexpected negative impact of level of direct ownership on the profitability of diversified banks remains significant only when the first alternative definition is used. To conclude, it appears as the results of the impact of ownership characteristics on risk-adjusted profitability is most sensitive to the strategy variable definitions and that the fourth definition which uses other earning assets to total assets while accounting for the impact of off balance sheet items is the definition which gives the most divergent results.

[Insert Table 10 about here]

[Insert Table 11 about here]

Finally, a number of refinements to the model specifications are done and the regressions are rerun for the main profitability variables *ROE* and *ROE_RA*. First, I account for persistence in bank profitability by including the lagged dependent variable in the model specification. The main findings that management ownership has a positive impact on profitability in non-traditional banks, that the level of direct management ownership has a negative impact on the

profitability of traditional banks, that board ownership has a positive impact on the profitability of traditional banks, and that the level of direct board ownership has a negative impact on the profitability of diversified banks remain. Second, the management ownership variables are refined by accounting for employee ownership thus creating a variable for insider ownership (*INSIDE*). This refinement does not alter the previously presented result; *INSIDE* has a positive and significant impact on the profitability of non-traditional banks, whereas *INSIDE%* has a negative and significant impact on the profitability of traditional banks. In addition, *INSIDE* has a positive and significant impact on the profitability of diversified banks. Third, the bank specific control variable *DEPOSITS* is refined so that the deposit insurance limit per person in the home country of the bank is taken into account following Demirguc-Kunt & Detragiache (2002) and Barth *et al.* (2007). Apart for the positive impact of *BOARD%* on the risk-adjusted profitability of diversified banks, the main findings remain intact in this model specification. Forth, I use loan loss provisions to total loans as an alternative bank specific control variable for risk. This risk measure gives an indication of the quality of the loans (Valnek (1999)), but also of opacity in the operations (Flannery *et al.* (2004)). The main results remain intact in this model specification. However, *BOARD* appears to have a negative impact on the risk-adjusted profitability of non-traditional banks. Finally, the impact of M&A activity is controlled for by including a dummy variable taking the value one if the annual change in assets during the past two years is less than -5% or greater than 30%, and zero otherwise. Once more, the main results remain intact. I note that the impact of *MGT* on the risk-adjusted profitability remains insignificant in all specifications.

6   CONCLUSION

In this study I combine the ownership and diversification literature and define expectations on the impact of management and board ownership on the profitability of traditional, diversified and non-traditional banks. I argue that the agency problem varies with the strategy of the bank and that the efficiency of ownership characteristics used as corporate governance mechanisms hence also varies with the strategy of the bank.

This study presents new insights on the impact of ownership characteristics on the profitability of banks with different strategy. I find that management ownership has a positive impact on the profitability of non-traditional banks. Management ownership does, however, not have a positive and significant impact on risk-adjusted profitability, a finding which suggests that greater profitability is achieved by increasing the risk of the operations. The results also suggest that management ownership has a positive impact on the profitability of diversified banks.

Furthermore, board ownership has a positive impact on the profitability of traditional banks. The positive impact of management ownership on the profitability of non-traditional banks indicates that banks which are difficult to monitor due to complexity in products and/or high volatility in income streams benefit from management ownership. Management, rather than board ownership, also appears to improve the profitability of diversified banks.

These results suggest that it is not the lack of incentives to monitor, but rather the too difficult to monitor aspect of the agency problem, which prevail in diversified banks. The greater complexity in the business model of diversified banks does not, however, seem to result in risk-averse behaviour among managers, or in extraction of private benefits; the inverted U-shape is not found among diversified banks. The finding that board ownership has a positive impact on the profitability of traditional banks indicates that increasing the monitoring incentives for the board is of greatest importance in banks where the government guarantees reduce the monitoring incentives of the depositors, but the business model is still not too complex for an outside monitor to grasp. Hence, I conclude the the efficiency of ownership characteristics as corporate governance mechanisms are not the same across banks with different strategy and in some settings a particular ownership characteristic can even be harmful. These findings have policy implications in that the same regulation or guiding principles for good corporate governance should be accustomed to the different needs and challenges of traditional, diversified and non-traditional.

Apart from the new insights on the efficiency of ownership characteristics as corporate governance mechanisms in banks with different strategy, the study contributes to the ownership literature with some empirical findings on the impact of management and board ownership on profitability on a more general level, i.e. where the strategy of the bank are not accounted for. First, it appears as management ownership has a positive impact on profitability, which is inline with the finding presented in DeYoung *et al.* (2001). Moreover, management ownership does not appear to have a significant impact on risk-adjusted profitability. This finding suggests that management ownership also induce risk-taking behaviour, a finding previously reported by Saunders et al. (1990) and Sullivan & Spong (2007). With respect to the inverted U-shape relation between direct management ownership and profitability, found in a banking context by DeYoung *et al.* (2001), the results presented in this study do indicate that the relation is nonlinear. However, I do not find support for the finding presented in DeYoung et al. (2001) that board ownership would have a positive impact on bank profitability. Moreover, it appears as the impact of management ownership on profitability is greater in listed than in unlisted banks, which is in conflict with the idea presented in e.g. Loderer & Waelchli (2006) that

internal corporate governance mechanisms are of lesser importance in listed banks as they are under stricter control by external corporate governance mechanisms. Hence, it appears as the positive impact of management ownership on bank profitability and the finding that management ownership induces risk-taking behaviour could be generalised to a European banking setting. The findings on the impact of board ownership on profitability are, however, contradictory.

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Table 1 Differences in characteristics of agency problem and expected impact of management and board ownership.			
	Traditional bank	**Diversified bank**	**Non-traditional bank**
Characteristics of agency problem			
Incentives to monitor	• Low due to deposit insurance. • (Low due to TBTF guarantee.)	• Low due to TBTF guarantee. • (Low due to deposit insurance.)	
Difficulty to monitor			• Low due to high volatility in profitability. • Low due to complexity in products.
Risk-shifting	• High due to deposit insurance.	• High due to cross-subsidisation opportunities.	• High due to low transparency.
Risk aversion		• May be reason to diversify.	
Extraction of private benefits		• High due to complexity in business model.	
Expected impact of ownership characteristic on profitability			
Mgt ownership		• Positive due to difficulty to monitor.	• Positive due to difficulty to monitor.
Inverted U-shape of mgt ownership		• Most pronounced due to risk-aversion.	
Board ownership	• Positive due to lower incentives for depositors to monitor.	• Positive due to lower incentives for depositors to monitor.	

Table 2	Summary of definition of primary variables used in the model specification and the expected impact on profitability regardless of bank strategy.	
Profitability variables		
ROE	Return on average equity.	
ROA	Return on average assets.	
ROE_RA	ROE of the current year divided by the standard deviation in the past three years' ROE.	
ROA_RA	ROA of the current year divided by the standard deviation in the past three years' ROA.	
Ownership variables		
MGT	Dummy variable taking the value 1 if the bank has management ownership and 0 otherwise.	+
MGT%	The level of direct management ownership in percentage.	+
$MGT\%^2$	The square of MGT%.	-
BOARD	Dummy variable taking the value 1 if the bank has board ownership and 0 otherwise.	+
BOARD%	The level of direct board ownership in percentage.	+
Strategy variables		
TRAD	Dummy variable taking the value 1 if the average of the non interest income to total operating income ratio and the other earning assets to total earnings assets taking into account off balance sheet items is below 1/3 and 0 otherwise.	+ / -
DIV	Dummy variable taking the value 1 if the average of the non interest income to total operating income ratio and the other earning assets to total earnings assets taking into account off balance sheet items is within the range of 1/3 and 2/3 and 0 otherwise.	-
NONTRAD	Dummy variable taking the value 1 if the average of the non interest income to total operating income ratio and the other earning assets to total earnings assets taking into account off balance sheet items is above 2/3 and 0 otherwise.	+
Bank specific control variables		
SIZE	Natural logarithm of total assets.	+
DEPOSITS	Total deposits to total funding.	+
EQUITYASS	Total equity to total assets.	+ / -
Institutional and environmental control variables		
COUNTRY	A vector including country dummy variables.	n.a.
YEAR	A vector including year dummy variables.	n.a.

Table 3. Descriptive statistics for the full sample and sub-samples of banks with different strategy.

Sample	Full sample								TRAD		DIV		NONTRAD		TRAD - DIV	DIV - NONTRAD	TRAD - NONTRAD
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XIII	XIV	XV
	Obs	Mean	Std.	Min	1st quartile	Median	3rd quartile	Max	Obs	Mean	Obs	Mean	Obs	Mean	Diff.	Diff.	Diff.
Type of bank																	
BHC	901	0.131	0.338						200	0.120	485	0.095	216	0.222			
COMMERCIAL	901	0.752	0.432						200	0.840	485	0.829	216	0.500			
INVESTMENT	901	0.117	0.321						200	0.040	485	0.076	216	0.278			
Listed vs. unlisted																	
LISTED	901	0.349	0.477						200	0.375	485	0.363	216	0.292			
UNLISTED	901	0.627	0.484						200	0.615	485	0.602	216	0.694			
DELISTED	901	0.019	0.136						200	0.010	485	0.025	216	0.014			
Location of headquarter																	
WESTERN	901	0.737	0.441						200	0.710	485	0.647	216	0.963			
EASTERN	901	0.129	0.335						200	0.105	485	0.184	216	0.028			
EX-SOVIET	901	0.134	0.341						200	0.185	485	0.169	216	0.009			
Bank specific control variables																	
SIZE	901	7.992	2.206	2.832	6.438	7.754	9.237	14.084	200	8.147	485	8.120	216	7.562	0.027	0.585***	0.558***
DEPOSITS	901	0.665	0.217	0.000	0.550	0.732	0.832	0.990	200	0.652	485	0.692	216	0.618	-0.040**	0.034***	0.074
EQUITYASS	901	0.135	0.133	-0.019	0.065	0.096	0.154	0.959	200	0.107	485	0.120	216	0.194	-0.013	-0.087***	-0.074***
Profitability variables																	
ROE	901	0.124	0.071	-0.016	0.067	0.118	0.172	0.314	200	0.124	485	0.128	216	0.115	-0.004	0.009**	0.013
ROA	901	0.015	0.017	-0.004	0.006	0.011	0.019	0.186	200	0.013	485	0.014	216	0.020	-0.001	-0.007***	-0.006***
ROE_RA	339	4.437	3.818	-0.430	1.880	3.341	5.899	19.988	55	5.305	197	4.465	87	3.827	0.841	1.478	0.637**
ROA_RA	336	4.358	3.701	-0.480	1.912	3.263	5.902	17.385	59	5.607	191	4.271	86	3.694	1.336**	1.913	0.577***
Ownership variables																	
MGT*	901	0.122	0.328	0.000	0.000	0.000	0.000	1.000	200	0.095	485	0.101	216	0.194	-0.006	-0.099***	-0.093***
MGT%	822	0.030	0.132	0.000	0.000	0.000	0.000	1.000	180	0.009	448	0.031	194	0.047	-0.022**	-0.038	-0.015**
MGT%^{2}	822	0.018	0.107	0.000	0.000	0.000	0.000	1.000	180	0.004	448	0.021	194	0.024	-0.017*	-0.020	-0.003**
BOARD	901	0.098	0.297	0.000	0.000	0.000	0.000	1.000	200	0.110	485	0.095	216	0.093	0.015	0.017	0.002
BOARD%	828	0.018	0.103	0.000	0.000	0.000	0.000	0.998	183	0.019	450	0.020	195	0.012	-0.001	0.007	0.009

This table shows the summary statistics for the full sample and the sub-samples of traditional (*TRAD*), diversified (*DIV*) and non-traditional (*NONTRAD*) banks. Some background information on whether the bank is *LISTED* or *UNLISTED*, whether it is a *BHC, COMMERCIAL* or *INVESTMENT* bank and whether it is headquartered in a *WESTERN* European, *EASTERN* European or *EX_SOVIET* state, including Russia, is presented in the top of the table. The bank specific control variables are bank size measured as the natural logarithm of total assets (*SIZE*), deposits to total liabilities (*DEPOSITS*) and equity to total assets (*EQUITYASS*). Profitability is measured as return on equity (*ROE*) return on assets (*ROA*), *ROE* divided by the three year standard deviation in *ROE* (*ROE_RA*) and *ROA* divided by the three year standard deviation in *ROA* (*ROA_RA*). The ownership variables are dummy variables taking the value 1 if the bank has management ownership (*MGT*) or has board member ownership (*BOARD*), respectively, and 0 otherwise as well as the continuous variables level of direct management ownership in percentage (*MGT%*), level of direct management ownership percentage squared (*MGT%^{2}*) and level of direct board ownership in percentege (*BOARD%*). The results of the unpaired *t*-tests for the difference in means of the sub-samples are included at the end of the table. ***, ** and * denote the significance at 1%, 5% and 10%, respectively.

Table 4. Impact of management ownership on profitability in banks with different strategy.

Panel A. Existence of ownership.

Dependent variable	ROE	ROA	ROE_RA	ROA_RA	ROE	ROA	ROE_RA	ROA_RA
	I	II	III	IV	V	VI	VII	VIII
Observations	901	901	339	336	901	901	339	336
Constant	0.087***	0.006	4.932***	4.142***	0.087***	0.006	4.506**	3.980***
	[0.027]	[0.005]	[1.656]	[1.414]	[0.027]	[0.005]	[1.769]	[1.469]
MGT	0.017**	0.002	-0.207	-0.344	0.000	0.002	1.665	0.294
	[0.008]	[0.002]	[0.532]	[0.648]	[0.017]	[0.003]	[1.391]	[1.451]
MGT*DIV					0.014	0.002	-2.492*	-0.844
					[0.020]	[0.004]	[1.393]	[1.625]
MGT*NONTRAD					0.030	0.000	-1.567	-0.602
					[0.021]	[0.005]	[1.676]	[1.617]
DIV	0.005	0.001	-1.228	-1.863**	0.004	0.001	-0.875	-1.739**
	[0.006]	[0.001]	[0.771]	[0.767]	[0.007]	[0.001]	[0.873]	[0.861]
NONTRAD	0.016*	0.002	-1.836*	-3.077***	0.012	0.002	-1.702	-3.015***
	[0.008]	[0.002]	[0.942]	[1.013]	[0.009]	[0.002]	[1.057]	[1.111]
SIZE	0.006***	0.000	-0.012	0.115	0.006***	0.000	0.006	0.121
	[0.002]	[0.000]	[0.107]	[0.122]	[0.002]	[0.000]	[0.108]	[0.122]
DEPOSITS	-0.025	-0.005*	2.169	1.23	-0.024	-0.005*	2.151	1.224
	[0.017]	[0.003]	[1.341]	[1.123]	[0.017]	[0.003]	[1.346]	[1.128]
EQUITYASS	-0.069**	0.077***			-0.068**	0.077***		
	[0.030]	[0.013]			[0.030]	[0.014]		
R-squared	0.210	0.483	0.174	0.188	0.212	0.483	0.181	0.189
Adjusted R-squared	0.180	0.463	0.088	0.106	0.180	0.462	0.089	0.100
Joint F-tests: MGT+MGT*DIV=0								
Sum of coefficients					0.014	0.004*	-0.827	-0.550
F-value					1.380	2.950	1.840	0.350
Joint F-tests: MGT+MGT*NONTRAD=0								
Sum of coefficients					0.030**	0.002	0.098	-0.308
F-value					4.770	0.070	0.010	0.180

Panel B. Level of ownership

Dependent variable	ROE	ROA	ROE_RA	ROA_RA	ROE	ROA	ROE_RA	ROA_RA
	I	II	III	IV	V	VI	VII	VIII
Observations	822	822	304	303	822	822	304	303
Constant	0.088***	0.007	3.912**	4.158***	0.088***	0.007	3.891**	4.158***
	[0.029]	[0.005]	[1.765]	[1.531]	[0.029]	[0.005]	[1.781]	[1.546]
MGT%	-0.004	-0.002	-1.176	-2.286*	-0.106***	-0.015**	-3.401	-6.521*
	[0.022]	[0.004]	[0.965]	[1.176]	[0.039]	[0.006]	[3.197]	[3.361]
MGT%*DIV					0.106**	0.016**	1.897	3.895
					[0.050]	[0.008]	[3.407]	[3.606]
MGT%*NONTRAD					0.112**	0.009	2.998	5.108
					[0.049]	[0.011]	[3.685]	[3.722]
DIV	0.008	0.001	-0.900	-1.687*	0.007	0.001	-0.919	-1.731*
	[0.007]	[0.001]	[0.822]	[0.862]	[0.007]	[0.001]	[0.861]	[0.898]
NONTRAD	0.017*	0.002	-1.488	-3.037***	0.016*	0.002	-1.572	-3.144***
	[0.009]	[0.002]	[1.021]	[1.118]	[0.009]	[0.002]	[1.058]	[1.159]
SIZE	0.006***	0.000	0.046	0.093	0.006***	0.000	0.051	0.098
	[0.002]	[0.000]	[0.110]	[0.124]	[0.002]	[0.000]	[0.110]	[0.126]
DEPOSITS	-0.028	-0.006**	1.649	1.096	-0.027	-0.006**	1.662	1.113
	[0.018]	[0.003]	[1.437]	[1.249]	[0.018]	[0.003]	[1.435]	[1.248]
EQUITYASS	-0.066**	0.080***			-0.066**	0.080***		
	[0.032]	[0.014]			[0.032]	[0.014]		
R-squared	0.216	0.501	0.146	0.185	0.218	0.502	0.146	0.186
Adjusted R-square	0.183	0.480	0.045	0.091	0.183	0.480	0.039	0.086
Joint F-tests: MGT%+MGT%*DIV=0								
Sum of coefficients					0.000	0.001	-1.504	-2.626*
F-value					0.000	0.060	1.620	3.220
Joint F-tests: MGT%+MGT%*NONTRAD=0								
Sum of coefficients					0.006	-0.006	-0.403	-1.413
F-value					0.040	0.510	0.060	0.780

This table shows results of the regressions for the impact of management ownership on profitability measured as return on equity (ROE), return on assets (ROA), risk adjusted return on equity (ROE_RA) and risk adjusted return on assets (ROA_RA). In Panel A management ownership is measured by the dummy variable for existence of management ownership (MGT), whereas it is measured by level of direct management ownership in percentage (MGT%) in Panel B. MGT and MGT% pick up the impact in the reference group of traditional banks, whereas the interaction terms with the strategy variables DIV and NONTRAD pick up the additional effect of management ownership in diversified and non-traditional banks compared to banks in the reference group of traditional banks. The results of the joint F-tests of the impact of management ownership in diversified and non-traditional banks are presented at the bottom of the table. The bank specific control variables are bank size measured as the natural logaritm of total assets (SIZE), deposits to total liabilities (DEPOSITS) and equity to total asset ratio (EQUITYASS). Year and country variables are included in the model s specification. The standard errors are corrected for clusters of observations from the same bank. Robust standard errors are stated in brackets. ***, ** and * denote the significance at 1%, 5% and 10%, respectively.

Table 5. Nonlinearity in the impact of managment ownership on profitability.

Sample	Full		TRAD		DIV		NONTRAD	
Dependent variable	ROE	ROA	ROE	ROA	ROE	ROA	ROE	ROA
	I	II	III	IV	V	VI	VII	VIII
Observations	822	822	180	180	448	448	194	194
Constant	0.085***	0.006	0.185***	0.014	0.067	0.003	0.156***	0.028**
	[0.028]	[0.005]	[0.066]	[0.011]	[0.041]	[0.009]	[0.050]	[0.014]
$MGT\%$	0.110	0.015	-0.204*	-0.024	0.136	0.024	0.117	0.015
	[0.069]	[0.013]	[0.115]	[0.018]	[0.114]	[0.017]	[0.090]	[0.019]
$MGT\%^2$	-0.146*	-0.022	0.201	0.025	-0.171	-0.028	-0.201*	-0.036
	[0.081]	[0.016]	[0.134]	[0.021]	[0.127]	[0.021]	[0.112]	[0.023]
DIV	0.008	0.001						
	[0.007]	[0.001]						
$NONTRAD$	0.016*	0.002						
	[0.009]	[0.002]						
$SIZE$	0.006***	0.000	-0.001	-0.001	0.009***	0.000	0.001	-0.001
	[0.002]	[0.000]	[0.004]	[0.001]	[0.002]	[0.001]	[0.003]	[0.001]
$DEPOSITS$	-0.028	-0.006**	-0.031	-0.003	-0.037	-0.006*	-0.049	-0.017*
	[0.018]	[0.003]	[0.038]	[0.006]	[0.025]	[0.004]	[0.031]	[0.009]
$EQUITYASS$	-0.064**	0.081***	-0.108	0.087***	-0.076	0.076***	-0.085**	0.071***
	[0.032]	[0.014]	[0.089]	[0.026]	[0.064]	[0.024]	[0.042]	[0.019]
R-squared	0.220	0.503	0.316	0.488	0.280	0.492	0.310	0.576
Adjusted R-squared	0.187	0.481	0.172	0.381	0.224	0.453	0.207	0.513

This table shows results of the regressions testing the nonlinearity of the impact of management ownership on profitability measured as return on equity (ROE) and return on assets (ROA) in the full sample and sub-samples of traditional ($TRAD$), diversified (DIV) and non-traditional ($NONTRAD$) banks. $MGT\%$ is the level of direct managment ownership in percentage and $MGT\%^2$ is the square of $MGT\%$. The bank specific control variables are bank size measured as the natural logaritm of total assets ($SIZE$), deposits to total liabilities ($DEPOSITS$) and equity to total asset ratio ($EQUITYASS$). Year and country variables are included in the model specification. The standard erros are corrected for clusters of observations from the same bank. Robust standard errors are stated in brackets. ***, ** and * denote the significance at 1%, 5% and 10%, respectively.

Table 6. Impact of board ownership on profitability in banks with different strategies.

Panel A. Existence of ownership.

| | ROE | ROA | ROE_RA | ROA_RA | ROE | ROA | ROE_RA | ROA_RA |
	I	II	III	IV	V	VI	VII	VIII
Observations	901	901	339	336	901	901	339	336
Constant	0.087***	0.006	4.774***	4.059***	0.088***	0.007	4.705***	3.848***
	[0.027]	[0.005]	[1.564]	[1.302]	[0.027]	[0.005]	[1.565]	[1.313]
BOARD	0.014	0.001	0.192	-0.437	0.045***	0.005***	2.313	3.214
	[0.009]	[0.001]	[0.908]	[0.853]	[0.015]	[0.002]	[2.991]	[2.100]
BOARD*DIV					-0.044***	-0.006**	-3.139	-4.642**
					[0.019]	[0.003]	[3.110]	[2.256]
BOARD*NONTRAD					-0.036	-0.004	-1.239	-4.343*
					[0.023]	[0.004]	[3.472]	[2.282]
DIV	0.006	0.001	-1.238	-1.870**	0.010	0.001	-0.969	-1.496*
	[0.006]	[0.001]	[0.770]	[0.776]	[0.007]	[0.001]	[0.721]	[0.763]
NONTRAD	0.017**	0.002	-1.823*	-3.070***	0.021**	0.003*	-1.649*	-2.696***
	[0.008]	[0.002]	[0.926]	[1.015]	[0.009]	[0.002]	[0.867]	[0.980]
SIZE	0.006***	0.000	0	0.125	0.006***	0.000	0.009	0.143
	[0.002]	[0.000]	[0.100]	[0.113]	[0.002]	[0.000]	[0.100]	[0.113]
DEPOSITS	-0.025	-0.005*	2.151	1.215	-0.028	-0.005*	2.122	1.05
	[0.017]	[0.003]	[1.345]	[1.128]	[0.017]	[0.003]	[1.327]	[1.109]
EQUITYASS	-0.065**	0.077***			-0.068**	0.077***		
	[0.030]	[0.013]			[0.031]	[0.013]		
R-squared	0.208	0.482	0.174	0.188	0.213	0.483	0.181	0.203
Adjusted R-squared	0.178	0.462	0.088	0.106	0.181	0.462	0.089	0.116

Joint F-tests: BOARD+BOARD*DIV=0
					V	VI	VII	VIII
Sum of coefficients					0.001	-0.001	-0.826	-1.428*
F-value					0.010	0.010	1.010	2.810

Joint F-tests: BOARD+BOARD*NONTRAD=0
					V	VI	VII	VIII
Sum of coefficients					0.009	0.001	1.074	-1.129
F-value					0.310	0.310	0.360	1.160

Panel B. Level of ownership.

| | ROE | ROA | ROE_RA | ROA_RA | ROE | ROA | ROE_RA | ROA_RA |
	I	II	III	IV	V	VI	VII	VIII
Observations	828	828	313	311	828	828	313	311
Constant	0.093***	0.009	4.168***	3.767***	0.094***	0.009	4.121***	3.740***
	[0.028]	[0.005]	[1.550]	[1.352]	[0.028]	[0.005]	[1.551]	[1.357]
BOARD%	-0.024	-0.008*	2.109	-1.885*	0.030	0.003	-2.035**	-0.658
	[0.018]	[0.004]	[1.402]	[0.981]	[0.027]	[0.004]	[0.949]	[1.203]
BOARD%*DIV					-0.072**	-0.015**	4.401***	-1.816
					[0.032]	[0.006]	[1.373]	[1.677]
BOARD%*NONTRAD					-0.044	-0.011	14.292*	0.778
					[0.064]	[0.012]	[8.238]	[4.850]
DIV	0.011*	0.001	-0.771	-1.572**	0.012*	0.002*	-0.855	-1.541*
	[0.006]	[0.001]	[0.679]	[0.789]	[0.006]	[0.001]	[0.687]	[0.805]
NONTRAD	0.018**	0.002	-1.242	-2.635**	0.018**	0.002	-1.396	-2.632**
	[0.009]	[0.002]	[0.860]	[1.024]	[0.009]	[0.002]	[0.867]	[1.037]
SIZE	0.006***	0.000	0.065	0.156	0.006***	0.000	0.073	0.158
	[0.002]	[0.000]	[0.100]	[0.115]	[0.002]	[0.000]	[0.099]	[0.115]
DEPOSITS	-0.030*	-0.006**	1.573	0.914	-0.031*	-0.007**	1.656	0.923
	[0.018]	[0.003]	[1.353]	[1.217]	[0.018]	[0.003]	[1.361]	[1.220]
EQUITYASS	-0.070**	0.075***			-0.071**	0.075***		
	[0.032]	[0.014]			[0.032]	[0.014]		
R-squared	0.224	0.483	0.147	0.175	0.226	0.485	0.155	0.176
Adjusted R-square	0.192	0.462	0.049	0.084	0.192	0.462	0.052	0.078

Joint F-tests: BOARD%+BOARD%*DIV=0
					V	VI	VII	VIII
Sum of coefficients					-0.042**	-0.012**	2.366**	-2.474**
F-value					6.400	6.320	5.810	4.570

Joint F-tests: BOARD%+BOARD%*NONTRAD=0
					V	VI	VII	VIII
Sum of coefficients					-0.014	-0.008	12.257	0.120
F-value					0.060	0.520	2.230	0.000

This table shows results of the regressions for the impact of board ownership on profitability measured as return on equity (ROE) and risk adjusted return on equity (ROE_RA). In Panel A board ownership is measured by the dummy variable for existence of board ownership (BOARD), whereas it is measured by level of direct board ownership in percentage (BOARD%) in Panel B. BOARD and BOARD% pick up the impact in the reference group of traditional banks, whereas the interaction terms with the strategy variables DIV and NONTRAD pick up the additional effect of management ownership in diversified and non-traditional banks compared to banks in the reference group of traditional banks. The results of the joint F-tests of the impact of management ownership in diversified and non-traditional banks are presented at the bottom of the table. The bank specific control variables are bank size measured as the natural logaritm of total assets (SIZE), deposits to total liabilities (DEPOSITS) and equity to total asset ratio (EQUITYASS). Year and country variables are included in the model specification. The standard errors are corrected for clusters of observations from the same bank. Robust standard errors are stated in brackets. ***, ** and * denote the significance at 1%, 5% and 10%, respectively.

Table 7. Impact of management and board ownership on the profitability of listed vs. unlisted banks.

Panel A. Managment ownership

Sample	LISTED		UNLISTED		Sample	LISTED		UNLISTED	
Dependent variable	ROE	ROA	ROE	ROA	Dependent variable	ROE	ROA	ROE	ROA
	I	II	III	IV		V	VI	VII	VIII
Observations	314	314	587	587	Observations	302	302	520	520
Constant	0.157***	0.017**	0.084**	0.010	Constant	0.157***	0.018**	0.078**	0.008
	[0.045]	[0.008]	[0.034]	[0.007]		[0.044]	[0.008]	[0.037]	[0.007]
MGT	-0.015	0.003	0.009	0.003	MGT%	-1.425***	-0.029	-0.089***	-0.014***
	[0.024]	[0.000]	[0.024]	[0.006]		[0.488]	[0.063]	[0.032]	[0.005]
MGT*DIV	0.058*	-0.001	-0.015	-0.001	MGT%*DIV	1.630***	0.045	0.064	0.013*
	[0.030]	[0.005]	[0.027]	[0.006]		[0.495]	[0.064]	[0.043]	[0.008]
MGT*NONTRAD	0.078***	0.006	-0.005	-0.007	MGT%*NONTRAD	1.810***	0.080	0.078*	0.007
	[0.029]	[0.007]	[0.028]	[0.007]		[0.493]	[0.070]	[0.041]	[0.009]
Strategy variables	Yes	Yes	Yes	Yes	Strategy variables	Yes	Yes	Yes	Yes
Bank specific control variable	Yes	Yes	Yes	Yes	Bank specific control variable	Yes	Yes	Yes	Yes
R-squared	0.423	0.714	0.186	0.377	R-squared	0.439	0.703	0.187	0.401
Adjusted R-squared	0.350	0.679	0.136	0.339	Adjusted R-squared	0.365	0.664	0.130	0.359

Joint F-tests: MGT+MGT*DIV=0					Joint F-tests: MGT%+MGT%*DIV=0				
Sum of coefficients	0.043**	0.002	-0.006	0.002	Sum of coefficients	0.205***	0.016**	-0.025	-0.001
F-value	4.960	0.670	0.190	0.810	F-value	17.280	4.040	0.660	0.040
Joint F-tests: MGT+MGT*NONTRAD=0					Joint F-tests: MGT%+MGT%*NONTRAD=0				
Sum of coefficients	0.063***	0.009	0.004	-0.004	Sum of coefficients	0.385***	0.051**	-0.011	-0.007
F-value	15.230	2.530	0.070	1.110	F-value	50.360	3.970	0.190	1.070

Panel B. Board ownership

Sample	LISTED		UNLISTED		Sample	LISTED		UNLISTED	
Dependent variable	ROE	ROA	ROE	ROA	Dependent variable	ROE	ROA	ROE	ROA
	I	II	III	IV		V	VI	VII	VIII
Observations	314	314	587	587	Observations	300	300	528	528
Constant	0.204***	0.025***	0.081**	0.010	Constant	0.217***	0.025***	0.086**	0.012*
	[0.044]	[0.009]	[0.034]	[0.007]		[0.045]	[0.008]	[0.036]	[0.007]
BOARD	0.024	0.006**	0.053**	0.004	BOARD%	0.004	0.004	0.064*	0.005
	[0.019]	[0.002]	[0.021]	[0.002]		[0.029]	[0.003]	[0.034]	[0.006]
BOARD*DIV	-0.015	-0.007**	-0.063**	-0.005	BOARD%*DIV	-0.380***	-0.057***	-0.093**	-0.016*
	[0.024]	[0.003]	[0.026]	[0.004]		[0.104]	[0.014]	[0.042]	[0.008]
BOARD*NONTRAD	-0.055*	-0.013*	-0.025	0.001	BOARD%*NONTRAD	-0.247*	-0.067*	-0.015	0.003
	[0.031]	[0.007]	[0.032]	[0.005]		[0.138]	[0.040]	[0.050]	[0.008]
Strategy variables	Yes	Yes	Yes	Yes	Strategy variables	Yes	Yes	Yes	Yes
Bank specific control variable	Yes	Yes	Yes	Yes	Bank specific control variable	Yes	Yes	Yes	Yes
R-squared	0.389	0.713	0.193	0.374	R-squared	0.410	0.702	0.191	0.382
Adjusted R-squared	0.313	0.677	0.144	0.336	Adjusted R-squared	0.332	0.662	0.135	0.340

Joint F-tests: BOARD+BOARD*DIV=0					Joint F-tests: BOARD%+BOARD%*DIV=0				
Sum of coefficients	0.009	-0.001	-0.010	-0.001	Sum of coefficients	-0.376***	-0.053***	-0.029	-0.011*
F-value	0.300	0.310	0.410	0.250	F-value	13.230	16.460	2.060	3.840
Joint F-tests: BOARD+BOARD*NONTRAD=0					Joint F-tests: BOARD%+BOARD%*NONTRAD=0				
Sum of coefficients	-0.031	-0.007	0.028	0.005	Sum of coefficients	-0.243*	-0.063	0.049	0.008*
F-value	1.620	1.770	1.310	1.140	F-value	3.320	2.560	1.610	3.840

This table shows results of the regressions for the impact of management ownership (Panel A) and board ownership (Panel B) on profitability in the sub-sample of *LISTED* and *UNLISTED* banks. The latter includes the delisted banks. Profitability is measured as return on equity (*ROE*) or return on assets (*ROA*). The ownership variables *MGT*, *MGT%*, *BOARD* and *BOARD%* pick up the impact in the reference group of traditional banks, whereas the interaction terms with the strategy variables *DIV* and *NONTRAD* pick up the additional effect of management or board ownership in diversified and non-traditional banks compared to banks in the reference group of traditional banks. The results of the joint *F*-tests of the impact of management ownership in diversified and non-traditional banks are presented at the end of the table. The bank specific control variables are bank size measured as the natural logaritm of total assets (*SIZE*), deposits to total liabilities (*DEPOSITS*) and equity to total asset ratio (*EQUITYASS*). Year and country variables are included in the model specification. The standard erros are corrected for clusters of observations from the same bank. Robust standard errors are stated in brackets. ***, ** and * denote the significance at 1%, 5% and 10%, respectively.

Table 8. Impact of management on profitability when applying Heckman two-step model and a simultaneous equation system.

Panel A. ROE.	Heckman two-step (MGT in 1st step)				Heckman two-step (DIV in 1st step)				Simultaneous equation system					
Dependent variable	MGT	ROE	MGT	ROE	DIV	ROE	DIV	ROE	MGT	DIV	ROE	MGT	DIV	ROE
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV
Observations	728	728	438	438	739	739	444	444	728	728	728	438	438	438
Constant	-1.246***	0.192***	-1.589**	0.098***	-0.088	0.447***	-0.236	0.317***	0.098	0.477***	0.084***	0.060	0.424***	0.082***
	[0.315]	[0.043]	[0.646]	[0.036]	[0.178]	[0.143]	[0.249]	[0.079]	[0.060]	[0.070]	[0.024]	[0.048]	[0.096]	[0.028]
ROE(t-1)	0.592		0.357		0.518		0.677		0.166**	0.165		0.054	0.196	
	[0.403]		[0.710]		[0.360]		[0.533]		[0.071]	[0.107]		[0.049]	[0.125]	
SIZE(t-1)	-0.133***		-0.066		0.021		0.039		-0.027***	0.007		-0.005	0.014	
	[0.032]		[0.062]		[0.023]		[0.030]		[0.006]	[0.009]		[0.005]	[0.012]	
RISKOPER	1.040***		-0.591						0.240***			-0.043		
	[0.311]		[0.636]						[0.064]			[0.049]		
RIGHTS	0.007**		0.005						0.002***			0.000		
	[0.003]		[0.006]						[0.001]			[0.000]		
LISTED					-0.020		-0.043			-0.013			-0.022	
					[0.107]		[0.134]			[0.042]			[0.053]	
MGT(t-1)			2.921***				-0.311					0.778***	-0.125*	
			[0.279]				[0.193]					[0.030]	[0.075]	
BOARD(t-1)			-0.273				-0.014					-0.041	-0.009	
			[0.351]				[0.214]					[0.033]	[0.084]	
MGT		0.004		-0.005		0.005		0.044**			0.008			0.011
		[0.020]		[0.021]		[0.017]		[0.021]			[0.018]			[0.021]
MGT*DIV		0.002		0.016		0.000		0.010			0.009			0.018
		[0.023]		[0.023]		[0.021]		[0.021]			[0.021]			[0.024]
MGT*NONTRAD		0.027		0.040		0.023		0.048*			0.029			0.043
		[0.024]		[0.028]		[0.022]		[0.025]			[0.022]			[0.026]
DIV		-0.020**		0.001		0.003		0.000			0.004			0.001
		[0.009]		[0.009]		[0.007]		[0.009]			[0.007]			[0.008]
NONTRAD		-0.041***		0.017		0.010		0.013			0.009			0.016
		[0.015]		[0.011]		[0.009]		[0.010]			[0.009]			[0.010]
Mill's Lambda		-0.119***		-0.009		-0.437***		-0.250***						
		[0.032]		[0.007]		[0.167]		[0.078]						
Bank specific controls	No	Yes	No	Yes	No	Yes	No	Yes	No	No	Yes	No	No	Yes
R-squared		0.240		0.283		0.265		0.322	0.065	0.004	0.208	0.635	0.016	0.280
Adjusted R-square		0.200		0.221		0.227		0.264						

Joint F-test: MGT+MGT*DIV=0

Sum of coefficients		0.006		0.011		0.005		0.054***			0.017			0.029**
F-value		0.240		0.440		0.140		8.620			2.530			4.500

Joint F-test: MGT+MGT*NONTRAD=0

Sum of coefficients		0.031**		0.035		0.028**		0.092***			0.037***			0.054***
F-value		5.300		2.420		4.620		18.370			8.900			10.510

Table 8 (cont'd).

Panel B. *ROA*.

	Heckman two-step (MGT in 1st step)				Heckman two-step (DIV in 1st step)				Simultaneous equation system					
Dependent variable	MGT	ROA	MGT	ROA	DIV	ROA	DIV	ROA	MGT	DIV	ROA	MGT	DIV	ROA
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV
Observations	728	728	438	438	739	739	444	444	728	728	728	438	438	438
Constant	-1.261***	0.035***	-1.538**	0.016**	0.002	-0.206***	-0.127	-0.080***	0.091	0.511***	0.008*	0.063	0.469***	0.012**
	[0.320]	[0.010]	[0.656]	[0.008]	[0.187]	[0.069]	[0.263]	[0.025]	[0.062]	[0.074]	[0.005]	[0.050]	[0.104]	[0.006]
ROA(t-1)	2.554		-0.980		-1.448		-1.346		0.883	-0.678		0.079	-0.795	
	[2.571]		[4.594]		[2.250]		[2.800]		[0.592]	[0.894]		[0.434]	[1.119]	
SIZE(t-1)	-0.124***		-0.067		0.017		0.035		-0.025***	0.006		-0.005	0.012	
	[0.033]		[0.062]		[0.024]		[0.031]		[0.006]	[0.009]		[0.005]	[0.012]	
RISKOPER	1.037***		-0.577						0.237***			-0.042		
	[0.311]		[0.637]						[0.065]			[0.049]		
RIGHTS	0.007**		0.005						0.002***			0.000		
	[0.003]		[0.006]						[0.001]			[0.000]		
LISTED					0.010		-0.002			-0.003			-0.011	
					[0.107]		[0.134]			[0.042]			[0.053]	
MGT(t-1)			2.934***				-0.274					0.782***	-0.109	
			[0.280]				[0.193]					[0.030]	[0.076]	
BOARD(t-1)			-0.233				0.008					-0.039	0.003	
			[0.346]				[0.213]					[0.033]	[0.084]	
MGT		0.002		-0.002		0.001		-0.011**			0.003			0.003
		[0.004]		[0.004]		[0.003]		[0.005]			[0.003]			[0.004]
MGT*DIV		0.000		0.003		0.001		0.001			0.001			0.003
		[0.005]		[0.004]		[0.004]		[0.005]			[0.004]			[0.005]
MGT*NONTRAD		-0.001		0.001		0.001		-0.002			-0.001			0.001
		[0.006]		[0.007]		[0.005]		[0.007]			[0.004]			[0.005]
DIV		-0.005***		0.001		0.001		0.001			0.000			0.000
		[0.002]		[0.002]		[0.001]		[0.001]			[0.001]			[0.002]
NONTRAD		-0.010***		0.004		0.002		0.003			0.002			0.003*
		[0.003]		[0.002]		[0.001]		[0.002]			[0.002]			[0.002]
Mill's Lambda		-0.028***		-0.002		0.263***		0.101***						
		[0.008]		[0.002]		[0.086]		[0.027]						
Bank specific controls	No	Yes	No	Yes	No	Yes	No	Yes	No	No	Yes	No	No	Yes
R-squared		0.484		0.486	0.002	0.535		0.536	0.061	0.002	0.459	0.634	0.011	0.482
Adjusted R-square		0.457		0.441		0.511		0.496						
Joint F-test: MGT+MGT*DIV=0														
Sum of coefficients		0.002		0.001		0.002		-0.010**			0.004**			0.006**
F-value		1.180		0.010		1.000		4.320			4.550			4.420
Joint F-test: MGT+MGT*NONTRAD=0														
Sum of coefficients		0.001		-0.001		0.002		-0.013			0.002			0.004
F-value		0.070		0.040		0.270		2.210			0.590			1.580

This table shows results of 1) the Heckman two-step regression where the endogeneity of *MGT* is adressed, 2) the Heckman two-step regression where the selection bias of *DIV* is adressed and 3) the simultaneous equation system where both *MGT* and *DIV* are modelled before applying the original model specification to examine the impact of managment ownership on profitability. In Panel A the profitability variable is return on equity (*ROE*), whereas in Panel B it is return on assets (*ROA*). The results of the joint *F*-tests of the impact of management ownership in diversified and non-traditional banks are presented at the bottom of the table. The standard errors are corrected for clusters of observations from the same bank. Robust standard errors are stated in brackets. ***, ** and * denote the significance at 1%, 5% and 10%, respectively.

Table 9. Impact of board on profitability when applying Heckman two-step model and a simultaneous equation system.

Panel A. ROE.

	Heckman two-step (BOARD in 1st step)				Heckman two-step (DIV in 1st step)				Simultaneous equation system					
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV
Dependent variable	BOARD	ROE	BOARD	ROE	DIV	ROE	DIV	ROE	BOARD	DIV	ROE	BOARD	DIV	ROE
Observations	728	728	438	438	739	739	444	444	728	728	728	438	438	438
Constant	-0.923***	0.343***	-1.398**	0.134***	-0.088	0.455***	-0.236	0.190***	0.142***	0.476***	0.085***	0.076*	0.424***	0.094***
	[0.332]	[0.099]	[0.629]	[0.041]	[0.178]	[0.140]	[0.249]	[0.054]	[0.052]	[0.070]	[0.024]	[0.044]	[0.096]	[0.028]
ROE(t-1)	0.492		0.288		0.518		0.677		0.139**	0.167		0.050	0.190	
	[0.341]		[0.602]		[0.360]		[0.533]		[0.062]	[0.107]		[0.045]	[0.125]	
SIZE(t-1)	-0.105***		0.011		0.021		0.039		-0.016***	0.008		-0.001	0.015	
	[0.035]		[0.065]		[0.023]		[0.030]		[0.005]	[0.009]		[0.004]	[0.012]	
RISKOPER	-0.021		-0.884						0.012			-0.052		
	[0.338]		[0.708]						[0.056]			[0.045]		
RIGHTS	0.005		-0.007						0.001			0.000		
	[0.003]		[0.006]						[0.000]			[0.000]		
LISTED					-0.020		-0.043			-0.016			-0.023	
					[0.107]		[0.134]			[0.042]			[0.053]	
MGT(t-1)			0.128				-0.311					0.003	-0.124*	
			[0.358]				[0.193]					[0.028]	[0.075]	
BOARD(t-1)			2.972***				-0.014					0.765***	-0.009	
			[0.298]				[0.214]					[0.030]	[0.084]	
BOARD		0.059***		0.024		0.055***		0.045**			0.065***			0.057***
		[0.016]		[0.021]		[0.016]		[0.018]			[0.018]			[0.019]
BOARD*DIV		-0.066***		-0.057**		-0.066***		-0.045*			-0.060***			-0.051**
		[0.022]		[0.027]		[0.021]		[0.025]			[0.021]			[0.024]
BOARD*NONTRAD		-0.057**		-0.089***		-0.047*		-0.061*			-0.064**			-0.078***
		[0.025]		[0.029]		[0.025]		[0.031]			[0.026]			[0.030]
DIV		0.011		0.012		0.010		0.009			0.012*			0.010
		[0.007]		[0.009]		[0.007]		[0.009]			[0.007]			[0.008]
NONTRAD		0.022**		0.036***		0.019**		0.028**			0.021**			0.030***
		[0.009]		[0.011]		[0.009]		[0.011]			[0.008]			[0.010]
Mill's Lambda		-0.247***		-0.018**		-0.446***		-0.096**						
		[0.089]		[0.008]		[0.164]		[0.049]						
Bank specific controls	No	Yes	No	Yes	No	Yes	No	Yes	No	No	Yes	No	No	Yes
R-squared		0.271		0.281		0.271		0.276	0.019	0.004	0.212	0.619	0.016	0.271
Adjusted R-square		0.233		0.219		0.233		0.214						
Joint F-test: BOARD+BOARD*DIV=0														
Sum of coefficients		-0.007		-0.033		-0.011		0.000			0.005			0.006
		0.270		1.950		0.700		0.000			0.200			0.180
Joint F-test: BOARD+BOARD*NONTRAD=0														
Sum of coefficients		0.002		-0.065**		0.008		-0.016			0.001			-0.021
		0.010		5.650		0.150		0.410			0.010			0.840

Table 9 (cont'd).

Panel B. ROA.

	Heckman two-step (BOARD in 1st step)				Heckman two-step (DIV in 1st step)				Simultaneous equation system					
Dependent variable	BOARD	ROA	BOARD	ROA	DIV	ROA	DIV	ROA	BOARD	DIV	ROA	BOARD	DIV	ROA
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV
Observations	728	728	438	438	739	739	444	444	728	728	728	438	438	438
Constant	-0.920***	0.103***	-1.391**	0.019**	0.002	-0.208***	-0.127	-0.046***	0.144***	0.510***	0.009**	0.078*	0.471***	0.014**
	[0.339]	[0.024]	[0.644]	[0.009]	[0.187]	[0.068]	[0.263]	[0.014]	[0.054]	[0.074]	[0.005]	[0.046]	[0.104]	[0.006]
ROA(t-1)	1.623		0.738		-1.448		-1.346		0.425	-0.671		0.077	-0.841	
	[2.781]		[5.143]		[2.250]		[2.800]		[0.518]	[0.894]		[0.398]	[1.119]	
SIZE(t-1)	-0.099***		0.014		0.017		0.035		-0.015***	0.006		-0.001	0.012	
	[0.035]		[0.066]		[0.024]		[0.031]		[0.005]	[0.009]		[0.004]	[0.012]	
RISKOPER	-0.018		-0.884						0.010			-0.051		
	[0.337]		[0.707]						[0.057]			[0.045]		
RIGHTS	0.005		-0.007						0.001			0.000		
	[0.003]		[0.006]						[0.000]			[0.000]		
LISTED					0.010		-0.002			-0.006			-0.011	
					[0.107]		[0.134]			[0.042]			[0.053]	
MGT(t-1)			0.143				-0.274					0.003	-0.112	
			[0.364]				[0.193]					[0.028]	[0.076]	
BOARD(t-1)			2.979***				0.008					0.768***	0.003	
			[0.298]				[0.213]					[0.030]	[0.084]	
BOARD		0.007***		0.002		0.006***		0.005**			0.008**			0.006
		[0.002]		[0.004]		[0.002]		[0.002]			[0.003]			[0.004]
BOARD*DIV		-0.009***		-0.007		-0.009***		-0.010**			-0.008**			-0.007
		[0.003]		[0.005]		[0.003]		[0.004]			[0.004]			[0.005]
BOARD*NONTRAD		-0.008**		-0.011**		-0.005		-0.013***			-0.009*			-0.010*
		[0.004]		[0.005]		[0.004]		[0.004]			[0.005]			[0.006]
DIV		0.002*		0.002		0.002**		0.002			0.001			0.001
		[0.001]		[0.002]		[0.001]		[0.002]			[0.001]			[0.002]
NONTRAD		0.004**		0.005**		0.003*		0.004*			0.003*			0.005**
		[0.002]		[0.003]		[0.002]		[0.002]			[0.002]			[0.002]
Mill's Lambda		-0.089***		-0.002		0.266***		0.062***						
		[0.022]		[0.002]		[0.084]		[0.014]						
Bank specific controls	No	Yes	No	Yes	No	Yes	No	Yes	No	No	Yes	No	No	Yes
R-squared		0.516		0.485		0.538		0.526	0.014	0.002	0.460	0.619	0.011	0.482
Adjusted R-square		0.491		0.440		0.514		0.485						
Joint F-test: BOARD+BOARD*DIV=0														
Sum of coefficients		-0.002		-0.005		-0.003		-0.005			0.000			-0.001
F-value		0.360		0.570		1.450		1.860			0.000			0.010
Joint F-test: BOARD+BOARD*NONTRAD=0														
Sum of coefficients		-0.001		-0.009		0.001		-0.008***			-0.001			-0.004
F-value		0.020		2.200		0.090		7.940			0.070			0.650

This table shows results of 1) the Heckman two-step regression where the endogeneity of *BOARD* is adressed, 2) the Heckman two-step regression where the selection bias of DIV is adressed and 3) the simultaneous equation system where both *BOARD* and *DIV* are modelled before applying the original model specification used to examine the impact of board ownership on profitability. In Panel A the profitability variable is return on equity (*ROE* whereas in Panel B it is return on assets (*ROA*). The results of the joint *F* -tests of the impact of management ownership in diversified and non-traditional banks are presented at the bottom of the table. The standard errors are corrected for clusters of observations from the same bank. Robust standard errors are stated in brackets. ***, ** and * denote the significance at 1%, 5% and 10%, respectively.

	TRAD	DIV	NONTRAD
Table 10 Number (and share) of observations in the sub-sample of traditional, diversified and non-traditional banks as categorised with the help of different financial ratios.			
Average of *NONINTINC* and *OTHEARNASS* incl. *OFFBALANCE*.	200 (22%)	485 (54%)	216 (24%)
1) Average of *NONINTINC* and *OTHEARNASS* excl. *OFFBALANCE*	288 (32%)	422 (47%)	191 (21%)
2) *NONINTINC*	226 (25%)	441 (49%)	234 (26%)
3) *OTHEARNASS* excl. *OFFBALANCE*	317 (35%)	403 (45%)	179 (20%)
4) *OTHEARNASS* incl. *OFFBALANCE*	201 (22%)	385 (43%)	313 (35%)

This table shows how the bank-year observations are allocated to the sub-samples of traditional (*TRAD*), diversified (*DIV*) and non-traditional (*NONTRAD*) banks as different financial ratios are used in the categorisation. The shaded ratio is the one applied in the analysis and the numbered ratios are the ones applied in robustness checks. *NONINTINC* stand for non interest income to total operating income, *OTHEARASS* for other earning assets than loans to total earning assets, and *OFFBALANCE* for off balance sheet items to total earning assets plus off balance sheet items. The cut-off points are maintained at 1/3 and 2/3.

Table 11. Robustness test with alternative strategy variable definitions.

Panel A. Managment ownership.

Ownership variable	MGT								MGT%							
Dependent variable	ROE				ROE_RA				ROE				ROE_RA			
Strategy variable definition	1)	2)	3)	4)	1)	2)	3)	4)	1)	2)	3)	4)	1)	2)	3)	4)
Observations	901	901	899	899	339	339	399	399	822	822	820	820	304	304	304	304
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI
Impact in TRAD	0.001	-0.004	0.013	0.006	0.559	0.852	1.332	2.199	-0.071***	-0.108**	-0.051	-0.070	-3.410	0.437	-3.781	-3.322
Impact in DIV	0.018	0.002	0.018*	0.021	-0.487	-0.674	0.107	-0.872	0.020	-0.049**	0.002	0.008	-1.079	-1.466	0.081	-1.274
Impact in NONTRAD	0.027**	0.035***	0.020	0.019	0.021	0.115	-1.247	-0.205	0.003	0.032	0.003	-0.019	-0.769	-0.293	-2.803	-0.805

Panel B. Board ownership.

Ownership variable	BOARD								BOARD%							
Dependent variable	ROE				ROE_RA				ROE				ROE_RA			
Strategy variable definition	1)	2)	3)	4)	1)	2)	3)	4)	1)	2)	3)	4)	1)	2)	3)	4)
Observations	901	901	899	899	339	339	339	339	828	828	826	826	313	313	313	313
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI
Impact in TRAD	0.035**	0.015	0.015	0.021	1.731	0.735	0.533	-3.932**	-0.009	-0.003	-0.032*	-0.017	3.287	3.225	3.420	-3.262***
Impact in DIV	0.002	0.020	0.020	0.021	-1.133	-1.318	0.851	1.180	-0.035**	-0.020	-0.030	-0.041	-1.232	-1.169	1.031	5.576***
Impact in NONTRAD	0.011	0.002	-0.004	-0.004	0.858	0.487	-0.960	-0.128	-0.014	-0.052***	-0.009	-0.024	11.460	10.564	-3.122	0.090

This table presents a summary of the regressions run with alternative strategy variable definitions as defined in Table 9, i.e. 1) the average of *NONINTINC* and *OTHEARNASS* excl. *OFFBALANCE*, 2) *NONINTINC*, 3) *OTHEARNASS* excl. *OFFBALANCE* and 4) *OTHEARNASS* incl. *OFFBALANCE*. Panel A present the results for the impact of manament ownership in traditional (*TRAD*), diversified (*DIV*) and non-traditional (*NONTRAD*) banks, whereas Panel B present the results for the impact of board ownership in traditional (*TRAD*), diversified (*DIV*) and non-traditional (*NONTRAD*) banks. The original model specification defined in Equation (2) is applied. ***, ** and * denote the significance at 1%, 5% and 10%, respectively.