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Pyramiding of Family-owned Banks in Emerging Markets

Abstract

This paper analyzes family-owned banks in Thailand. Using the data before the financial crisis, we find that wealthy families extensively use pyramids to control a business empire which includes financial and non-financial firms. We analyze the entire family group structure and find that one-third of the banks were placed at the second tier near the apex and two-third of the banks were located at deeper tiers in the pyramids. The empirical results show that bottom tier banks have lower performance due to risky loans. This evidence is consistent with the view that when the controlling family maximizes growth and stability of the entire group, lower tier firms are assigned to undertake risky investment. This ownership setting can insulate the entire group from the adverse effect when the investment does not pay off because the family owns relatively low cash flow stake in lower tier firms.

1 Introduction

A growing body of research shows that banks in many countries around the world are owned by families (e.g., Caprio, Laeven, and Levine (forthcoming) and Brown and Dinc (2005)). Many of these banks are the country's largest banks and owned by wealthy families who own an extensive business empire. For example, in Asia, Hong Kong's largest locally owned bank, the Bank of East Asia is owned by David Li family; Thailand's largest bank, the Bangkok Bank, is owned by the Sophonpanich family. In Europe, Sweden's largest bank, the SEB bank, is controlled by the Wallenbergs family. In Latin America, the Banco de Chile is controlled by one of Chile's wealthiest, the Luksić family. Despite the voluminous literature on how non-financial firms controlled by the family are structured, little is known about why and how families own banks. Our study fills this gap in the literature by investigating banks as parts of family-owned business groups. More precisely, we investigate how the pyramidal ownership structure affects bank lending behavior and profitability.

In the existing literature, there are two main views on why families own firms using the pyramidal structure. Much of the existing literature supports the first view which emphasizes the conflicts of interests between the controlling shareholders and minority shareholders (e.g., Johnson, La Porta, Lopez-de-Silanes, and Shleifer (2000)). Pyramids are chosen to facilitate tunneling – self-dealing to concentrate profits in companies owned directly by the controlling family. The second less dominant view emphasizes the diversification and growth of the entire group. Families can use existing firms to set up a number of new firms, thereby magnifying the family's actual wealth to control several firms (e.g., Almeida and Wolfenzon (2006) and Morck, Wolfenzon, and Yeung (2005)). Also, a pyramid creates an internal capital market which helps the family group overcome financial constraints, and therefore is able to expand their businesses.

Our hypothesis is in line with the second view. We hypothesize that pyramids can help insulate the entire family group from negative returns and shocks. When the stability of the group is the controlling family's main concern, the controlling family chooses investment strategy based on the location of firms in pyramids. Firms that are located deep in pyramids

1

are used to undertake risky investment, while safer investment is carried by the firms near the apex. If the risky investment does not pay off, it would not strongly affect the entire group because the controlling family holds only a small part, corresponding to its small cash flow rights in lower tier firms.

To perform this analysis, we study Thailand because we can obtain detailed ownership data of family groups that own both financial and non-financial firms. Our database allows us not only to draw a broader picture of the family business group, but also to define precisely where banks are located within the group. We focus on the period before the financial crisis (1992-1996) when the country was in an economic downturn as firms and banks were facing deteriorating investment opportunities. We study banks because their investment was concentrated on lending, which enables us to identify the channel through which poor performance is caused. The pre-crisis period also allows us to investigate the choices made by the controlling family to locate "good" and "risky" loans.

We begin our analysis by drawing the ownership structure of the entire group. We find that pyramids were extensively used to control banks by their ultimate owners. We observe the maximum of four tiers in the pyramids. The apex of pyramids is often dominated by holding companies. About one-third of the banks in our sample are placed in the second tier, and two-third of the banks are in the third tier. Interesting results emerge. We find that the ratio of ownership to control rights held by the controlling family in the top and bottom tier banks are not statistically different. The results indicate that the expropriation problem should be similar in both types of banks, and hence their performance. However, when we classify the banks based on their locations in the pyramids, we observe that on average bottom tier banks had about 50% more loan growth than top tier banks. These loans might be considered as risky investment because bottom tier banks turn out to significantly underperform top tier banks: about 21% and 50% in terms of ROA and ROE, respectively. The empirical results are consistent with our hypothesis that the controlling family maximizes the entire group's stability and growth.

The results from our study can be extended to other emerging economies. Our findings suggest that when analyzing family-owned banks, it is instructive to apply the framework of

2

the family firm literature and consider the entire group firms with the same ultimate owner.

Our paper is part of a growing literature that examines the evolution of the ownership of family firms and the incentives for building pyramids. While we provide a novel approach by introducing "pyramidal tiers" to disentangle the expropriation and the growth hypotheses, others suggest that pyramids might exist for other reasons. Roe (2003) argues that family control pyramids help insulate shareholders from powerful labor unions and other social interests in developed welfare state economies such as Sweden. Morck (2005) contends that the pyramidal business groups in the U.S. largely disappeared due to the inter-corporate dividend taxation reforms in the 1930s. Fan, Wong, and Zhang (2006) argue that pyramids in China are built to signal the government's commitment to relinquish control over the firm to incumbent managers.

The remainder of this paper is organized as follows. Section 2 describes the data and sample. Section 3 discusses the ownership structure of family groups. Section 4 presents the empirical results. In Section 5, we discuss what happened to the banks that were placed in different locations in pyramids after the 1997 financial crisis. Section 6 concludes the paper.

2 Hypothesis development

Why do families build pyramids? To date, there are two main strands of research. One strand of research argues that families use pyramids to divert resources between the firms (Johnson, La Porta, Lopez-de-Silanes, and Shleifer (2000) and Bebchuk, Kraakman, and Triantis (2000)). The separation of ownership from control generates such incentives. Firms in lower tiers of control pyramids, in which the controlling shareholder's cash flow rights are small compared to voting rights, are more vulnerable to tunneling—the controlling shareholder is likely to transfer resources aggressively out of lower tier firms and into firms near the pyramid's apex. A large empirical literature measures the extent of tunneling within pyramids by using the ratio of the controlling owner's cash flow rights to control rights[1]. They find low profits in the group firms when there is a substantial divergence

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[1] See e.g., Claessens, Djankov, Fan, and Lang (2002), Mitton (2002), Lins (2003), Lemmon and Lins (2003), and Joh (2003)).

between the cash flow rights and control rights of the controlling family.

While not denying the importance of the tunneling problem, the second strand of research argues that families use pyramids to enlarge their business empires. Almeida and Wolfenzon (2006) and Morck, Wolfenzon, and Yeung (2005) among others, contend that pyramids magnify the family's actual wealth into control over a number of firms that are worth much more. Pyramids can also be used to create an internal market which helps relax financial constraints by letting group firms pool resources. Pyramids can be advantageous in particular for firms in emerging economies where external financing is expensive and limited due to poorly functioning markets and institutions (Khanna and Palepu (2000) and Khanna and Rivkin (2001)).

Our hypothesis is motivated by the second view. We hypothesize that a group pyramidal structure can overcome liquidity shock. More precisely, pyramids can be used to insulate the entire group from the downside of risky investments. As suggested by Morck and Nakamura (2004), the controlling family does not only carefully select what stakes each company should own in other group firms but also which firms to place where in the group. When the stability of the group is the controlling family's main concern, "core" firms which the family considers important to the group will be located closer to the apex. Non-core firms, however, are placed lower in the pyramid. Under this ownership structure, safer investment is carried by the firms near the apex, and riskier investment is conducted by the firms in lower tiers. The riskier investments are usually made to leverage the group's performance. As the controlling shareholder owns relatively smaller cash flow rights in lower tier firms, this organizational structure, therefore, can reduce the negative impact on the entire group's net return when the economic environment is not favorable.

Figure 1 illustrates the basic idea of our hypothesis. Family Z owns a bank and a number of other firms in the business group. We present two cases of different ownership structure. In case 1, Bank X is located at the second tier indicating a greater concern of the controlling family for the bank. In case 2, Bank Y is placed at the third tier indicating that Bank Y is not really a core firm of this family. In both Bank X and Bank Y, however, the ratio of ownership to control rights in the hands of the controlling family is exactly the same. In

which case, the expropriation hypothesis suggests that the degree of expropriation by the controlling family should be the same in both Bank X and Bank Y. Hence Bank X and Bank Y should have similar performance.

However, our hypothesis has a different prediction. A bank which is located in a higher tier should pursue less risky investment. Since in this study our focus is on banks, we analyze the lending behavior. Our hypothesis, therefore, suggests that Bank Y is more likely to hold riskier loans that have a higher chance of default, while Bank X is more likely to hold safer loans. As in bad states, the return of riskier projects is less than that of safer projects. The return of Bank Y is, therefore, lower than Bank X in bad states. When the downside of these risky loans is extremely high, the family group can also decide to sell out poorly performing banks in lower tiers. In case 1, if the family relinquishes Bank X, the group will lose control of two companies, B and C. In case 2, however, the controlling family will lose control of Company C if Bank Y is to be liquidated. So, pyramids make the entire group less sensitive to negative shocks.

[Figure 1 about here]

3   Data

3.1   Sample

We focus on all commercial banks and finance companies that were listed on the Stock Exchange of Thailand during 1992-1996. Because our focus is the role of family control, we exclude state-owned financial institutions. Due to data availability, we also cannot include non-listed banks and finance companies. Our final sample consists of 215 bank-year observations including 13 commercial banks and 36 finance companies. The number of banks varies each year due to exit and new entries to the exchange. The sample coverage accounts for 71.2% of the total assets of the financial sector. Table 1 describes the sample. Thereafter, "banks" refer to the banks and finance companies in our sample.

It should be noted that most of the Thai banks were founded by wealthy families. These family-owned banks had long enjoyed a high degree of protection against competition from

both local and foreign competitors in two important ways. First, there was a moratorium on the granting of new licences by the central bank. Second, until the financial crisis in 1997, foreign shareholding was limited to a level of 25%.

[Table 1 about here]

3.2 Ownership data

To construct the ownership structure of family groups and trace the ultimate ownership, we use the standard method suggested by La Porta, Lopez-de-Silanes, and Shleifer (1999), Claessens, Djankov, and Lang (2000), and Faccio and Lang (2002). In this study, we use a 10% threshold of control rights to define the ultimate owner.

We use a number of databases to trace the ultimate ownership. The main source of the ownership data is the company annual reports (FM 56-1). The annual reports are reproduced by the Stock Exchange of Thailand in two databases namely the I-SIM CD-ROM and the SETSMART on-line service. The FM 56-1 file includes shareholders with shareholdings of at least 0.5% and a list of affiliated companies and the shareholdings. We also use the Business On Line (BOL) database to obtain the ownership information of non-listed companies. The BOL company is the sole agent that has a license from the Ministry of Commerce to reproduce the accounting and ownership information of all companies that were registered at the Ministry of Commerce.

We treat all family members as well as companies ultimately owned by these members as a single shareholder to account for the fact that it is a common practice in Thailand that businesses are closely tied by an extensive family. A shareholder, therefore, includes individuals with the same surname as well as close families that are linked to the family by marriage. Surnames can be used to trace family relationship as family names in Thailand are unique and only people belonging to a family may use that family's name.

We use multiple data sources to identify family trees. The FM 56-1 file provides the information on the relationships between the major shareholders and the board members. For established families, we were able to trace family relationships using various documents

6

that provide a genealogical diagram of the top business group families. Brooker Group (2001) provides the list of the top 150 families, the affiliated companies, and family relationship. Sappaiboon (2000, 2001) provides detailed information on family trees of the top 100 families. For less established families, however, we were not able to trace the relationship beyond the last name and the family information provided in the company annual report (FM 56-1). Some of our financial data, therefore, may under-estimate the real value held by such families.

3.3   The pyramidal structure

We begin our analysis by drawing the ownership structure to identify which tiers banks are located in a family business group. We stop drawing pyramidal tiers when all banks and other listed companies that a family owns are identified. We present an example of ownership structure to illustrate our database and variables. Figure 2 shows the ownership structure of the Ratanarak family group as of 1996. This group is also known as the Ayudhya group. This group is a good example to illustrate how we allocate the firms in each of the pyramidal tiers and calculate the cash flow and voting rights. The Ratanarak forms an enormous pyramid with both financial and non-financial companies. The group also owned seven publicly traded firms. This group is actually one of the most complicated cases in our sample.

The Ratanarak owns one bank, the Bank of Ayudhya Plc. (BAY) and one finance company, the Ayudhya Investment and Trust Pcl. (AITCO). As these two banks are in our sample, our analysis is focused primarily on these two banks. Both BAY and AITCO are controlled by the Ratanarak family, characteristically, through a pyramid of companies that have shares with differential cash flow and voting rights.

At the apex of the pyramid, the Ratanarak located five holding companies, the Ratanarak company, the K group, the CKR company, the Super Assets, and the CKS Holding at the apex to control other companies in the group. Besides these holding companies, the Bangkok Broadcasting & TV Co., Ltd. (BBTV) which operates a military TV channel is also placed at the apex. The Ratanarak directly controls 29.3% of the voting rights of BBTV

and controls indirectly 26.2% via the CKS Holding. Since the direct shareholdings are more than indirect shareholdings, we place BBTV at the first tier. The BBTV in turn owns the following three holding companies namely the Great Luck Equity (30% of the votes), and the Great Fortune Equity (100% of the votes), and the BBTV Asset Management (25% of the votes). So, the Great Fortune Equity and the BBTV Asset Management are placed at the second tier of the pyramid.

The mechanism the Ratanarak used to control the Bank of Ayudhya (BAY) is indeed not straightforward. The Ratanarak directly owns only a 0.18% stake in BAY. But, through a control arrangement held by 13 group companies gives the family controls over 31.6% of voting rights and 21.40% of cash flow rights in BAY. Each of these 13 companies actually owns a small stake which ranges from 0.57% to a maximum of 5%. Since 17.24% of the voting rights in BAY are owned by the group's first tier firms, we place BAY at the second tier.

The Ratanarak also controls another three listed companies in the financial services industry that are located in the third tier. We present only the ownership of the Ayudhya Investment and Trust Pcl. (AITCO) because AITCO is a finance company which is in our sample. The other two companies, the Ayudhaya Insurance Plc. (AYUD) and the Ayudhaya Jardine CMG Life Plc. (AYUCO) are insurance companies and are not in our sample. The Ratanarak controls 59.63% of the voting rights and 35.45% of the cash flow rights of AITCO. The direct ownership owned by the Ratanarak family is only 9.21%. The rest is controlled through a chain of group companies namely BAY (10%), the Super Assets (3.58%), the Great Luck Equity (8%), the Great Fortune Equity (6.23%), BBTV (7.05%), the CKS Holding (5.33%), AYUD (4.1%), and AYUCO (6.13%). We locate AITCO at the third tier in the pyramid because the voting rights are concentrated in the second tier companies which are BAY (10%), the Great Luck Equity (8%), and the Great Fortune (6.23%).

In sum, the placement of companies appears to be consistent with the fact that banking has been the Ratanarak family's primary line of business since the group was established in the 1960s. Accordingly, BAY has served as a core firm of the group, so the Ratanarak

has placed it nearer to the apex. The group was diversified into financial services and insurance. Another significant expansion was the addition of non financial businesses namely construction materials. Therefore, the bank is located at a high tier and other firms fill lower tiers.

[Figure 2 about here]

4   Empirical results

In this section, we investigate how pyramidal ownership structure affects the bank's lending behaviors and its profitability. Our hypothesis is that banks that sit near bottom tiers in the pyramid are more likely to extend risky loans. So, bottom tier banks would have poorer performance.

Table 2 shows the sample classified according to which tiers in the pyramid the banks are located. We observe a total of four tiers in the pyramid. None of the banks are placed at the first tier. Banks are concentrated mostly in the second and third tiers. Only 3 banks were placed at the fourth tier. Ideally, we should compare the investment activities and performance of the banks located in the second, third, and fourth tier. However, this analysis is not feasible due to the small sample size of the fourth tier banks. Therefore, we classify the banks into two groups: top tier and bottom tier. A bank is classified in the top tier if it is placed at the second tier. If a bank sits at the third or fourth tier, it is classified as a bottom tier bank. Table 2 shows that the top tier banks account for 33% and bottom tier banks account for 67% of the total sample, respectively.

We measure risky loans by loan growth. We consider high loan growth as risky investment because the banks were operating in the economic downturn during 1992-1996 when there were few "good" lending opportunities. In addition, the financial industry became highly competitive with foreign entries when the market was liberalized during the early 1990s. The off-shore banking market, the Bangkok International Banking Facility (BIBF), was set up in 1993. To respond to the economic environment, banks should seek new profit opportunities and reduce corporate and real estate loans. Many banks, however, extended

aggressively real estate loans (Siamwalla (2004)). We measure loan growth as the percentage change in total outstanding loan.

To investigate whether or not the lending is excessively risky, we relate loan growth to performance. Specifically, if the lending was risky, it would result in poor performance. We measure profitability by the ratio of EBIT to total assets (ROA).

[Table 2 about here]

4.1 Univariate analysis

We begin this analysis by testing the association between pyramidal tiers and loan growth, and between pyramidal tiers and profitability. We run the univariate tests comparing loan growth, profitability and other firm characteristics of the top and bottom tier banks. Table 3 presents the results which strongly support our hypothesis. The bottom tier banks have a higher loan growth and a lower profitability than the top tier banks. The t-statistics of the test of means (t-test) and the z-statistics of the test of medians (Wilcoxon rank-sum test) are strongly significant at the 1% level. More specifically, the average loan growth was 31% for the bottom tier banks which is significantly higher than 20.9% for the top tier banks. On profitability, the average ROA for the bottom tier banks is 1.9% which is significantly lower than that of the top tier banks of 2.3%. Similar results are observed for another performance measure, the ratio of EBIT to equity (ROE).

Regarding other firm characteristics, except that top tier banks are significantly larger than lower tier banks, both groups of banks are similar in terms of the ratio of equity capital to total assets and the ratio of total loan to total assets.

On the ownership structure, in the top tier banks, on average the controlling family owns 23.3% of the cash flow rights and 28.9% of the voting rights. In the lower tier banks, the controlling family owns 20.3% of the cash flow rights and 27.1% of the voting rights. The univariate tests show that the ownership by the controlling family is not significantly different between the top tier banks and bottom tier banks. The results indicate that the variation of the ownership of banks in our sample is significantly low. This finding may be

10

consistent with our hypothesis that the locations where the banks are placed do matter, particularly when the sample firms have a similar ownership structure as measured by the ratio of the cash flow to voting rights.

[Table 3 about here]

4.2 Multivariate analysis

4.2.1 Model specification

We employ the regression analysis to investigate whether locations in a pyramid affect bank's lending behavior and profitability. To measure pyramidal tiers, we use a dummy variable "*bottom tier*" which is set to one if the bank is located at the third and fourth tier, and zero otherwise. The benchmark banks, therefore, are the top tier banks. To relate pyramidal tiers to lending and profitability, we employ two regression models. In the first model, the dependent variable is loan growth. In the second model, the dependent variable is the return on assets (ROA).

In the loan growth regression, we control for the effect of profitability and risk factors. If profitability increases a bank's cash flow, it improves the lending capacity. The ratio of the book value of equity capital to total assets is included as a measure for the bank's specific risk. The capital ratio may be negative related to loan growth. Low capitalized banks may take more risk to boost profits by extending loans more aggressively.

In the profitability equation, we include a loan growth variable to capture risk effects of loan portfolio on profitability. Compared to other assets, loans are often regarded as more risky than other forms of bank assets. We include squared loan growth to account for any non-linear effects of loan growth on profitability. Also, we include the capital ratio to capture bank-specific risk factors. Previous literature suggests both negative and positive relationships between capital and profits. On the negative relationship, as noted earlier, lower capitalized banks may have stronger incentives to take more risk to increase profitability. However, the level of capital can be positively related to the bank's profitability due to earnings retention.

11

In both models, we control for the ownership effects by including the percentage of cash flow rights and the ratio of cash flow to control rights by the controlling owner. We also control for the effect of bank characteristics such as bank size. Bank size is measured by the logarithm of total assets. Theoretically, the relationship between size and loan growth is not clear. Size captures loan supply conditions. Larger banks often have more branches, hence they may be able to acquire more deposits and are able to extend more loans. However, smaller banks may pursue a more aggressive lending policy to seek new investment opportunities to replace low return lending.

To control for bank types, we include a dummy variable, *finance company*, which equals one for finance companies and, zero otherwise. Year dummies are included to control for the economic conditions and the effect of any changes in regulations.

We employ the following two sets of regression techniques. First, we use the pooled OLS regression analysis in which the standard errors are adjusted by clustering at the bank level. Second, we employ the random-effects panel data model to address the potential biases arising from individual bank heterogeneity. Fixed-effects regressions are not feasible in our analysis because there is no within-bank position variation in the pyramids. In other words, our main explanatory variable, the pyramidal tier, is a time-invariate variable. We also perform Breusch and Pagan (1980) Lagrange multiplier tests to examine whether errors are independent (OLS vs. Random-effects).

4.2.2 Pyramidal tiers and loan growth

Table 4 reports the regression results when the dependent variable is loan growth. The results are consistent with the univariate tests. The estimated coefficients on the *bottom tier* dummy variable are positive and strongly significant at the 1% level in all of the regressions. The evidence suggests that banks located at the bottom tiers tend to pursue more aggressive lending policy than the banks situated at the top tiers of the pyramid. The estimated coefficients indicate that on average the bottom tier banks extend more loans than the top tier banks by about 9.5 percentage points.

Interestingly, in all of the regressions none of the estimated coefficients on the ownership

variables, the cash flow rights and the ratio of cash flow to control rights, are statistically significant. The results support our hypothesis that location in pyramids does matter in explaining the variation in loan growth.

Regarding the control variables, the coefficients have expected signs. We find that bank size is negatively and significantly associated with loan growth. The results suggest that larger banks are more reluctant to pursue riskier lending than the smaller ones. Higher capital banks appear to have lower loan growth. We find that more profitable banks tend to lend more. Lending behavior does not appear to be different between the commercial banks and finance companies.

[Table 4 about here]

4.2.3 Pyramidal tiers and profitability

In Table 5, we present the regression results of the relationship between the pyramidal tiers and profitability. Consistent with the univariate tests, we find that the estimated coefficients on the *bottom tier* dummy variable are negative and strongly significant in all models at the 1% level. The regression results indicate that on average the ROA of the bottom tier banks is about 1 percentage point lower than that of the top tier peers.

Similar to the previous regression results of loan growth, the estimated coefficients on the cash flow rights and the ratio of cash flow to control rights, are statistically insignificant in all models. This suggests that there is no relationship between the ownership variables and profitability.

The estimated results on other control variables have expected signs. The results indicate that larger banks are more profitable than smaller banks. We find a strong relationship between the capital ratio and profitability. On the relation between profitability and loan growth, the estimated coefficients are not significant in all the OLS regressions. In the random-effects regressions, loan growth is positively associated with profitability. Finally, we find that finance companies are more profitable than commercial banks.

In sum, we find that banks located deeper in pyramids perform worse than banks located

in higher tiers near the apex. The magnitude of the estimates indicate that the difference in profitability between lower and higher tier banks is economically significant. Lower tier banks experience lower ROA of about 0.01 percentage point than top tier banks. This difference on ROA is remarkable as it indicates the profitability gap of more than 21% of the average bottom tier banks ROA of 1.9%. Lending risky loans may be one of the reasons why bottom tier banks perform poorly than higher tier banks. Our empirical results indicate that banks at the bottom tiers extend about 9.5 percentage points more loans compared to the top tier banks. This difference of 9.5 represents about 48.3% of the average bottom tier banks loan growth of 31%, and therefore is of important economic significance. As bottom tier banks have significantly lower profitability than higher tier banks, these results suggest that loan growth can be considered as risky investment.

Overall, our results are consistent with our hypothesis that families chose the ownership structure to maximize the growth and stability of the group. We find that lower tier banks take more risk and hence end up with having a poorer performance than upper tier ones. Indeed, the fact that many bottom tier banks eventually failed after the 1997 financial crisis is consistent with our hypothesis. We will discuss the banks' fate in Section 5.

[Table 5 about here]

4.2.4   Robustness checks

To check the robustness of our findings, we perform the following analyses.

Alternative measures of performance

To test whether our results are robust to alternative profitability measures, we use ROE in lieu of ROA. ROE is defined as the ratio of the EBIT to the book value of equity. Table 6 presents the regression results. Our major finding remains the same. The estimated coefficients on the *bottom tier* are negative and strongly significant at the 5% and 1% levels. The coefficients indicate that lower tier banks are associated with about 11 percentage points lower ROE than top tier banks. Economically, the difference of 11 percentage points is also very important as it is equal to about 50% more than average bottom tier banks ROE of

18.1%. In unreported results, we repeat the analysis using the net interest margin as an alternative measure of the bank's profitability. The results are qualitatively similar to our main findings.

Endogeniety between loan growth and profitability

We address potential concerns about the endogeniety of loan and profitability. We employ the two stage least squares (2SLS) estimation technique and estimate two equations in which loan growth and performance are simultaneously determined (Molyneux, Remolona, and Seth (1998) and Hanazaki, Shim, Souma, and Wiwattanakantang (2006)). To make the equations system be identified, we add one instrumental variable in the loan growth and profitability equations. In the loan growth equation, we include the rate of loan growth in the previous year. In the profitability equation, the ratio of staff costs to total operating expenses is included. Table 7 presents the regression results. Our findings are robust to the estimation method. In the loan growth regression, the estimated coefficients on the *bottom tier* dummy are positive and statistically significant at the 5% level. In the ROA and ROE regressions, the estimated coefficients on the *bottom tier* dummy are negative. The coefficients are strongly significant at the 1% level in all regression models. The estimates from the 2SLS regressions are also close in magnitude to the estimates using the OLS and the random-effects methods. The results of Durbin-Wu-Hausman tests indicate that the pooled OLS estimates are unlikely to be biased due to the endogeniety problem.

Sub-sample

To test whether our results are biased from the non-homogeneous pooling sample of commercial banks and finance companies, we run regressions of the sub-sample that includes only finance companies. Our main results remained unchanged. We find that the bottom tier finance companies are positively related to the loan growth and negatively related to ROA and ROE. The magnitude of the estimated coefficients on the *bottom tier* dummy is larger than the results of all sample presented in Table 4 and Table 5.

[Table 6 and Table 7 about here]

15

5 Did family-owned banks prevail after the financial crisis?

In this section, we investigate what happened to the banks in each tier after the 1997 financial crisis. Table 8 shows the number of banks in 2003 compared to banks in 1996. We define that a bank is failed if it was either closed down or nationalized. We categorize the banks based on the location in the pyramids. Interestingly, we find that the survival rate of banks located in higher tiers is significantly higher. Statistically, about 70% of the banks that were located in the second tier survived. In contrast to top tier banks, only about 10% of the third tier banks did survive. The extreme cases are the fourth tier banks. None of the three banks that were located in the fourth tier survived.

It appears that after the crisis, many business groups were dramatically restructured (Polsiri and Wiwattanakantang (2006)). Anecdotal evidence shows that companies were rearranged throughout the pyramid. For example, the Ratanarak group became more vulnerable as a result of the crisis, and hence undertook a major restructuring and reorganizing the organizational and ownership structure. The Ratanarak decided to remain more focused on the financial services business which is the family's original strength. Therefore, the Ratanarak relinquished their controlling stake of the family's non-core businesses namely the Siam Cement City Pls. (SCCC), Karat Sanitaryware Plc. (KARAT), and many other non listed companies in the construction material business. The funding from selling the stakes of these companies was used to save the core business in the financial services industry, in particular, the Bank of Ayudhya (BAY).

What we observe in Thailand is consistent with Morck and Nakamura (2004) who illustrate the ownership of family owned *zaibatsu* in Japan. They argue that the ownership structure is dynamic. They find that when the Mitsui group became shaky in 1873 and 1909, the Mitsui family reorganized the pyramid extensively by moving the firms around. Core firms were placed near the apex, and non-core firms were moved lower in the pyramid.

[Table 8 about here]

16

6 Conclusion

This paper investigates family-owned banks in Thailand. We begin our analysis by examining the ownership structure of banks and non-financial firms that have the same ultimate owner. Our investigation shows that some wealthy families own an extensive empire that includes banks and other non-financial firms in various industries. The mechanisms that the families use to control the firms are pyramids. We find that on average families set up a pyramid of four tiers. A number of holding companies are placed at the apex. These holding companies are used to control other firms in the family group. About one-third of the banks in our sample are placed in the second tier in the pyramids which are categorized as "top tier banks". Another two-third of the banks are located in the third and fourth tiers which are classified as "bottom tier banks". We find that bottom tier banks tend to extend more loans and have lower performance. This finding suggests that bottom tier banks undertake risky investment. We show that these results are robust to different measures of performance and regression methods. Interestingly, we find that while most of the top tier banks survived after the crisis, most of lower tier banks failed.

This evidence is consistent with the view that when the controlling family is concerned about growth and stability of the entire group, they would choose not only what stakes to hold in each firm but also where to place the firms in the group pyramid. The controlling family can use lower tier firms to undertake risky investment. This ownership setting can insulate the entire group from the adverse effect in bad states if the investment does not pay off because the family owns relatively low cash flow stake in lower tier firms.

It would be interesting to carry out further studies to understand why families own banks. It is puzzling because group firms can share resources and hence *de facto* serve an internal capital market.

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Figure 1: Pyramids

CASE 1	CASE 2	
Family Z	**Family Z**	
↓ 25%	↓ 50%	– – – – – –
Company A O=25%, C=25% O/C=1.00	Company A O=50%, C=50% O/C=1.00	**Tier 1**
↓ 25%	↓ 50%	– – – – – –
Bank X O=6.25%, C=25% O/C=0.25	Company B O=25%, C=50% O/C=0.50	**Tier 2**
↓ 25%	↓ 50%	– – – – – –
Company B O=1.56%, C=25% O/C=0.063	**Bank Y** O=12.5%, C=50% O/C=0.25	**Tier 3**
↓ 25%	↓ 50%	– – – – – –
Company C O=0.39%, C=25% O/C=0.016	Company C O=6.25%, C=50% O/C=0.125	**Tier 4**
		– – – – – –
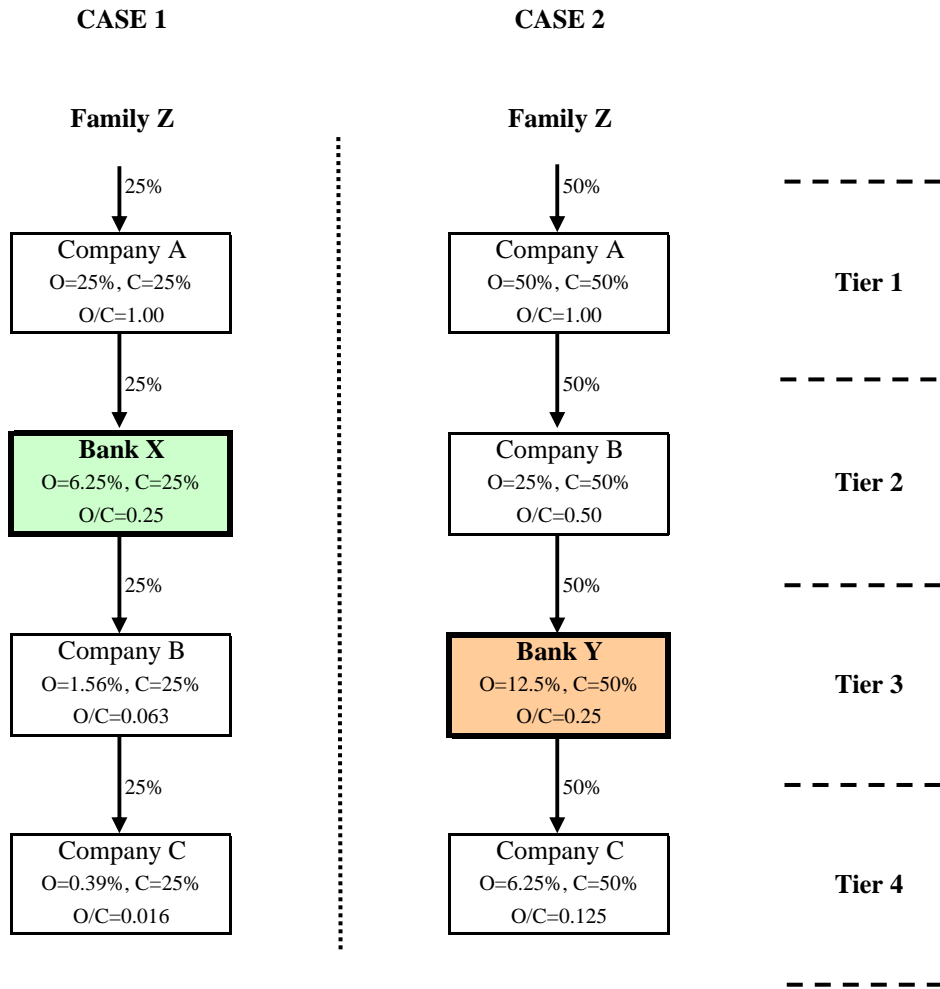
O = Ownership (cash flow rights)
C = Control rights (voting rights)
O/C = Ratio of ownership to control rights

Figure 2: The Ratanarak business group
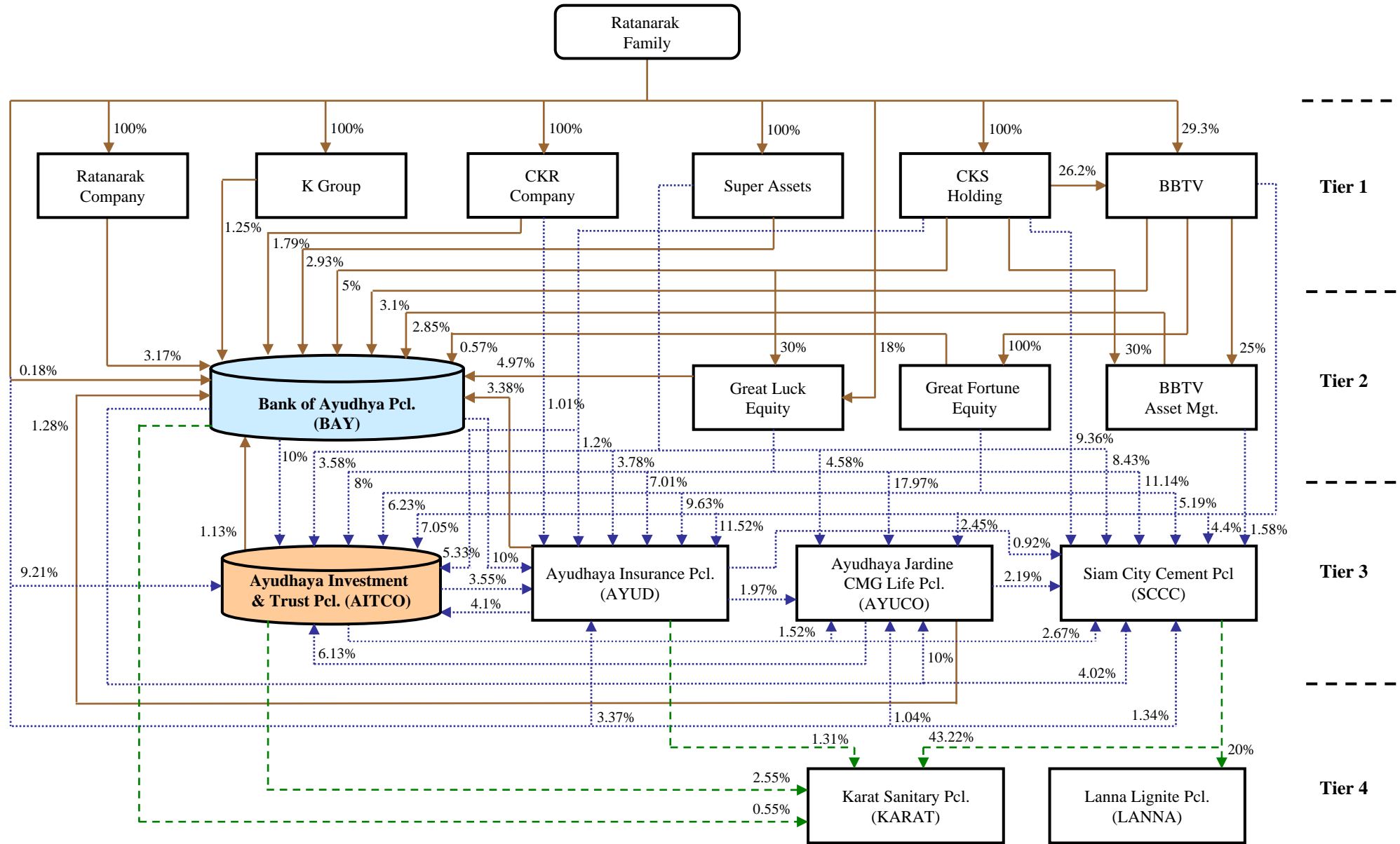
BAY: Ownership "O" = 21.40%, Control rights "C" = 31.60%, Ratio of ownership to control rights ("O/C") = 0.6772
AITCO: Ownership "O" = 35.45%, Control rights "C" = 59.63%, Ratio of ownership to control rights ("O/C") = 0.5945

Table 1: The sample

The sample includes all family-owned banks listed in the Stock Exchange of Thailand during 1992-1996.

	1992		1993		1994		1995		1996	
	No.	%	No.	%	No.	%	No.	%	No.	%
Commercial banks	13	33.3%	13	31.0%	13	30.2%	12	27.9%	12	25.0%
Finance companies	26	66.7%	29	69.0%	30	69.8%	31	72.1%	36	75.0%
Total sample	39	100.0%	42	100.0%	43	100.0%	43	100.0%	48	100.0%

Table 2: Pyramidal tiers

The table reports the distribution of the sample classified according to which tiers in the pyramid the banks are located.

	1992		1993		1994		1995		1996	
	No.	%	No.	%	No.	%	No.	%	No.	%
Top tier banks										
Tier 1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Tier 2	14	35.9%	14	33.3%	14	32.6%	14	32.6%	14	29.2%
Bottom tier banks										
Tier 3	23	59.0%	25	59.5%	26	60.5%	26	60.5%	31	64.6%
Tier 4	2	5.1%	3	7.1%	3	7.0%	3	7.0%	3	6.3%
Total sample	39	100.0%	42	100.0%	43	100.0%	43	100.0%	48	100.0%

Table 3: Summary statistics

The table reports summary statistics. Bottom tier banks are the banks that are placed at the third and fourth tiers in the pyramid. Top tier banks are the banks that are placed at the second tier of the pyramid. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

		Bottom tier banks	Top tier banks	Difference [Bottom-Top]	t-statistics (t-test)	z-statistics (Wilcoxon rank-sum test)
Loan growth	Mean	0.310	0.209	0.101	3.19***	3.13***
	[Median]	[0.252]	[0.198]	[0.054]		
Return on assets (ROA)	Mean	0.019	0.023	-0.004	-2.92***	-3.29***
	[Median]	[0.019]	[0.024]	[-0.005]		
Return on equity (ROE)	Mean	0.181	0.270	-0.089	-3.46***	-4.58***
	[Median]	[0.167]	[0.261]	[-0.094]		
Log (total assets)	Mean	4.420	4.809	-0.389	-5.25***	-4.24***
	[Median]	[4.337]	[4.731]	[-0.394]		
Book equity/total assets	Mean	0.104	0.099	0.005	0.89	0.97
	[Median]	[0.095]	[0.089]	[0.006]		
Total loan/total assets	Mean	0.811	0.822	-0.011	-1.33	-1.58
	[Median]	[0.829]	[0.833]	[-0.004]		
Cash-flow rights (O)	Mean	0.203	0.233	-0.030	-1.55	-1.21
	[Median]	[0.189]	[0.212]	[-0.023]		
Control rights (C)	Mean	0.271	0.289	-0.018	-1.01	-1.00
	[Median]	[0.257]	[0.307]	[-0.050]		
Cash-flow rights/control rights (O/C)	Mean	0.714	0.757	-0.043	-1.20	-1.00
	[Median]	[0.781]	[0.791]	[-0.010]		

Table 4: Pyramidal tiers and loan growth

The dependent variable is loan growth. Column 1-3 show pooled OLS regression results. Column 4-6 show random-effects regression results. Loan growth is defined as the one-year growth rate of the total outstanding loan. *Bottom tier* equals one if the bank is located at the third and fourth tiers, and zero otherwise. Cash flow rights is the percentage of ownership held by the controlling family. Cash flow rights/control rights is the ratio of cash flow rights to control rights held by the controlling family. Size is the logarithm of total assets. Capital/total assets is defined as total equity divided by total assets. ROA is defined as earnings before interest and taxes (EBIT) divided by total assets. *Finance company* equals one if the bank is a finance company, and zero otherwise. Numbers in parentheses of OLS regressions are *t*-statistics from heteroskedasticity-robust standard errors with clustering at the bank level. Numbers in parentheses of random-effects regressions are *z*-statistics from heteroskedasticity-robust standard errors. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	OLS			Random-effects		
	[1]	[2]	[3]	[4]	[5]	[6]
Bottom tier	0.094***	0.099***	0.095***	0.094***	0.099***	0.094***
	(2.75)	(2.94)	(2.74)	(2.60)	(2.69)	(2.60)
Cash flow rights/100		0.115			0.113	
		(1.05)			(0.92)	
Cash flow rights/control rights			0.016			0.013
			(0.23)			(0.19)
Size	-0.087**	-0.075*	-0.083*	-0.083*	-0.071	-0.080*
	(-2.06)	(-1.86)	(-1.93)	(-1.86)	(-1.51)	(-1.68)
Capital/total assets	-1.434***	-1.488***	-1.454**	-1.475***	-1.523***	-1.489***
	(-2.71)	(-2.80)	(-2.58)	(-2.95)	(-3.02)	(-2.94)
ROA	2.446*	2.389*	2.457*	2.501**	2.455**	2.508**
	(1.94)	(1.94)	(1.94)	(2.55)	(2.50)	(2.55)
Finance company	0.022	0.027	0.026	0.025	0.031	0.029
	(0.41)	(0.50)	(0.44)	(0.45)	(0.54)	(0.49)
Constant	0.605***	0.523**	0.575**	0.589**	0.505*	0.562**
	(2.67)	(2.40)	(2.37)	(2.39)	(1.92)	(2.00)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	204	204	204	204	204	204
Adjusted R-squared	0.231	0.235	0.231	0.231	0.235	0.231
p-value of Breusch and Pagan Lagrangian multiplier test				0.329	0.394	0.335

Table 5: Pyramidal tiers and profitability (ROA)

The dependent variable is profitability (ROA). Column 1-3 show pooled OLS regression results. Column 4-6 show random-effects regression results. ROA is defined as earnings before interest and taxes (EBIT) divided by total assets. *Bottom tier* equals one if the bank is located at the third and fourth tiers, and zero otherwise. Cash flow rights is the percentage of ownership held by the controlling family. Cash flow rights/control rights is the ratio of cash flow rights to control rights held by the controlling family. Size is the logarithm of total assets. Capital/total assets is defined as total equity divided by total assets. Loan growth is defined as the one-year growth rate of the total outstanding loan. *Finance company* equals one if the bank is a finance company, and zero otherwise. Numbers in parentheses of OLS regressions are *t*-statistics from heteroskedasticity-robust standard errors with clustering at the bank level. Numbers in parentheses of random-effects regressions are *z*-statistics from heteroskedasticity-robust standard errors. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	OLS			Random-effects		
	[1]	[2]	[3]	[4]	[5]	[6]
Bottom tier	-0.010***	-0.010**	-0.010***	-0.010***	-0.010***	-0.010***
	(-2.72)	(-2.62)	(-2.73)	(-3.72)	(-3.52)	(-3.72)
Cash flow rights		0.005			0.006	
		(1.09)			(0.63)	
Cash flow rights/control rights			-0.003			-0.003
			(-0.93)			(-0.55)
Size	0.008***	0.009***	0.007**	0.008**	0.009**	0.008**
	(3.01)	(3.02)	(2.51)	(2.45)	(2.52)	(2.08)
Capital/total assets	0.176***	0.173***	0.180***	0.159***	0.156***	0.161***
	(5.07)	(4.88)	(5.14)	(4.49)	(4.38)	(4.49)
Loan growth	0.027	0.027	0.027	0.029**	0.029**	0.029**
	(1.41)	(1.41)	(1.42)	(2.42)	(2.42)	(2.42)
Loan growth-squared	-0.014	-0.014	-0.014	-0.016	-0.016	-0.016
	(-0.88)	(-0.90)	(-0.90)	(-1.48)	(-1.51)	(-1.48)
Finance company	0.013***	0.014***	0.012**	0.014***	0.015***	0.014***
	(2.84)	(2.86)	(2.62)	(3.48)	(3.51)	(3.05)
Constant	-0.054***	-0.057***	-0.047**	-0.053***	-0.057***	-0.047**
	(-3.31)	(-3.30)	(-2.61)	(-2.83)	(-2.87)	(-2.17)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	204	204	204	204	204	204
Adjusted R-squared	0.448	0.450	0.450	0.447	0.449	0.449
p-value of Breusch and Pagan Lagrangian multiplier test				0.000***	0.000***	0.000***

Table 6: Pyramidal tiers and ROE

The dependent variable is ROE. Column 1-3 show pooled OLS regression results. Column 4-6 show random-effects regression results. ROE is defined as earnings before interest and taxes (EBIT) divided by total equity. *Bottom tier* equals one if the bank is located at the third and fourth tiers, and zero otherwise. Cash flow rights is the percentage of ownership held by the controlling family. Cash flow rights/control rights is the ratio of cash flow rights to control rights held by the controlling family. Size is the logarithm of total assets. Capital/total assets is defined as total equity divided by total assets. Loan growth is defined as the one-year growth rate of the total outstanding loan. *Finance company* equals one if the bank is a finance company, and zero otherwise. Numbers in parentheses of OLS regressions are *t*-statistics from heteroskedasticity-robust standard errors with clustering at the bank level. Numbers in parentheses of random-effects regressions are *z*-statistics from heteroskedasticity-robust standard errors. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	OLS			Random-effects		
	[1]	[2]	[3]	[4]	[5]	[6]
Bottom tier	-0.104**	-0.103**	-0.105**	-0.108***	-0.106***	-0.109***
	(-2.65)	(-2.61)	(-2.64)	(-3.64)	(-3.48)	-3.62
Cash flow rights		0.025			0.032	
		(0.58)			(0.32)	
Cash flow rights/control rights			-0.020			-0.018
			(-0.70)			(-0.32)
Size	0.091***	0.094***	0.086***	0.092**	0.095**	0.087**
	(3.85)	(3.83)	(3.49)	(2.49)	(2.46)	(2.20)
Capital/total assets	-0.148	-0.163	-0.123	-0.317	-0.338	-0.308
	(-0.67)	(-0.74)	(-0.55)	(-0.83)	(-0.87)	(-0.79)
Loan growth	0.341	0.341	0.342	0.349***	0.350***	0.349***
	(1.49)	(1.49)	(1.50)	(2.70)	(2.69)	(2.69)
Loan growth-squared	-0.198	-0.197	-0.198	-0.210*	-0.212*	-0.211*
	(-1.04)	(-1.05)	(-1.05)	(-1.82)	(-1.83)	(-1.82)
Finance company	0.139**	0.141**	0.133**	0.150***	0.152***	0.145***
	(2.61)	(2.61)	(2.55)	(3.38)	(3.37)	(3.04)
Constant	-0.399***	-0.416***	-0.359**	-0.390*	-0.412*	-0.353
	(-2.74)	(-2.71)	(-2.32)	(-1.93)	(-1.91)	(-1.51)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	204	204	204	204	204	204
Adjusted R-squared	0.340	0.340	0.341	0.339	0.340	0.340
p-value of Breusch and Pagan Lagrangian multiplier test				0.001***	0.001***	0.001***

Table 7: Two stage least squares (2SLS) regression

The table reports two stage least squares regression results. The dependent variable is loan growth in Column 1-3, ROA in Column 4-6, and ROE in Column 7-9, respectively. Loan growth is defined as the one-year growth rate of the total outstanding loan. ROA is defined as earnings before interest and taxes (EBIT) divided by total assets. ROE is defined as earnings before interest and taxes (EBIT) divided by total equity. *Bottom tier* equals one if the bank is located at the third and fourth tiers, and zero otherwise. Cash flow rights is the percentage of ownership held by the controlling family. Cash flow rights/control rights is the ratio of cash flow rights to control rights held by the controlling family. Other control variables are defined in Table 4-6. Numbers in parentheses are *t*-statistics from heteroskedasticity-robust standard errors. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	Loan growth			Profitability					
				ROA			ROE		
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
Bottom tier	0.085**	0.089**	0.087**	-0.008***	-0.008***	-0.008***	-0.085***	-0.084***	-0.085***
	(1.97)	(2.09)	(1.98)	(-3.06)	(-2.96)	(-3.08)	(-3.10)	(-3.03)	(-3.09)
Cash flow rights		0.176			0.003			0.013	
		(1.57)			(0.32)			(0.13)	
Cash flow rights/control rights			0.040			-0.003			-0.011
			(0.60)			(-0.60)			(-0.19)
Other control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	204	204	204	204	204	204	204	204	204
Adjusted R-squared	0.210	0.225	0.205	0.451	0.448	0.449	0.320	0.317	0.317
p-value of Durbin-Wu-Hausman test	0.514	0.587	0.501	0.842	0.854	0.847	0.888	0.893	0.889

Table 8: Family-owned banks after the financial crisis

The table shows the number of family-owned banks before and after the 1997 financial crisis. Pre-crisis is as of 1996. Post-crisis is as of 2003. A bank is defined as failure if it was either closed down or nationalized.

	Pre-crisis (as of 1996)	Post-crisis (as of 2003)			
		Survival		Failure	
		No.	%	No.	%
Top tier banks					
Tier 1	0	0	0.0%	0	0.0%
Tier 2	14	10	71.4%	4	28.6%
Bottom tier banks					
Tier 3	31	3	9.7%	28	90.3%
Tier 4	3	0	0.0%	3	100.0%
Total sample	48	13	27.1%	35	72.9%