Banks in Family Business Groups:

Pyramid, Lending Behavior, and Financial Crisis

Pramuan Bunkanwanicha*
ESCP Europe

Jyoti Gupta**
ESCP Europe

Yupana Wiwattanakantang***
National University of Singapore

March 16, 2012

*ESCP Europe, 79 avenue de la République 75011 Paris, France. Tel: +33 1 49 23 58 03; Fax: +33 1 49 23 20 80; E-mail: pbunkanwanicha@escpeurope.eu

**ESCP Europe – London campus, 527 Finchley Road, Hampstead, London NW3 7BG, United Kingdom. E-mail: gupta@escpeurope.eu

***National University of Singapore, Business School, Mochtar Riady Building, BIZ 1 2-7, 15 Kent Ridge Drive, Singapore 119245; E-mail: yupana@nus.edu.sg

Banks in Family Business Groups:

Pyramid, Lending Behavior, and Financial Crisis

Abstract

This paper investigates how banks and finance companies operate in a family business group. Using detailed ownership data from Thailand during the period prior to and after the 1997 financial crisis, we find that the controlling families extensively use pyramids to control their banks. The results show that the controlling family pursues different lending strategies across pyramidal tiers. Lower-tier banks tend to extend loans more aggressively and perform more poorly, while upper tier banks carry out more profitable investments. After the crisis hit, upper-tier banks survived and almost all lower-tier banks went bankrupt. Our results suggest that the multilayer structure of bank ownership can affect a bank's lending behavior and its resistance to economic shocks.

JEL classification: G21; G38

Keywords: Pyramids; Family business groups; Banks; Emerging markets

1 Introduction

A growing body of research shows that a significant number of banks and finance companies in many countries around the world are family owned (e.g., Caprio, Laeven, and Levine, 2007). For example, Hong Kong's largest locally owned bank, the Bank of East Asia, is owned by the David Li family. Sweden's largest bank, the SEB Bank, is controlled by the Wallenbergs family. In Chile, the Banco de Chile is controlled by one of the country's wealthiest families, the Luksić family. In the Philippines and Indonesia, more than two-thirds of the banks are family owned. Turkey presents a more extreme case where almost all banks are owned by families. Many of top finance companies in India are also owned by family business groups. Despite the prevalence of family group involvement in the financial and nonfinancial sectors, there is very little systematic evidence documenting how and why families own banks and other financial institutions. The existing literature focuses on the role of bank lending to connected firms (e.g., La Porta, Lopez de Silanes and Zamarippa, 2003; and Charumilind, Kali, and Wiwattanakantang, 2006).

Our study extends the existing literature by exhibiting how banks operate as part of a family-owned business group. Focusing on banks whose investments concentrated on lending allows us to identify the causes of poor performance. Thailand prior to the 1997 East Asian financial crisis provides an ideal setting to study this issue. Most banks and finance companies there were owned by wealthy families. This period also marked an important economic downturn for Thailand, which meant deteriorating lending opportunities for banks. In this economic situation, the controlling family might have had an incentive to pursue excessively risky actions.

We begin our analysis by detailing the ownership structure of the entire family business group. Our detailed ownership data allow us not only to draw a broader picture of the family business group but also to precisely define where banks are within the group. We find that pyramids were extensively used to control banks and firms. Figure 1 shows the ownership and control structure of the Ayudhya Group, owned by the Ratanarak family. Prior to the crisis, this group owned one bank, one finance company, two insurance companies, and a number of other nonfinancial companies. To control the bank (Bank of Ayudhya), the

family owned only a 0.18% stake directly, but via an ownership arrangement with the other 13 group companies, it controlled 31.6% of voting rights and 21.40% of cash flow rights in the bank[1].

Overall, we find that the average controlling family owned 21.2% of the cash flow stake and 27.7% of the voting rights of the banks. The evidence that the controlling shareholder owned a large stake of cash flow is consistent with the evidence from Europe, Canada, Turkey, India, and Brazil documented by recent studies (Section 2 provides a detailed discussion). Since the ultimate ownership is concentrated and the cash-flow rights are closely aligned to the voting rights, we find no significant relationship between the ratio of cash flow rights to voting rights and performance variables, namely return on assets (ROA) and return on equity (ROE).

The evidence casts doubt on the traditional view that groups build pyramids to expropriate minority shareholders. In fact, a growing body of research indicates there may be other motivations (Khanna and Yafeh, 2007). Almeida and Wolfenzon (2006a) draw a rigorous model showing that the controlling family chooses pyramids to "minimize" the variance between cash flow and voting rights. When setting up new firms that require high investment but generate low "security" profits, the family optimally sets them up as part of a pyramid. Pyramids allow the family to pool the group firms' retained earnings, allowing such low-profitability investments to be undertaken[2].

In a similar spirit, in our study we argue that the controlling family chooses the pyramidal structure to maximize the entire group's returns. When organizing a group, the controlling family chooses a firm's position in the group in addition to choosing the number of shares to own (Morck and Nakamura, 2004). Firms in which the controlling family has direct ownership rank higher in the pyramid. Because the family has access to internal funds, it can design investment strategies for the group firms based on their positions in the pyramids. Firms lower in the pyramids are used to undertake risky investments, while the firms nearest

[1] Similar evidence that groups have survived despite the crisis is also observed in other East Asian countries, namely Malaysia, Korea, Taiwan, and Singapore. Khanna and Yafeh (2007) provide a detailed discussion on this issue.

[2] In other words, in this model the negative relationship between pyramidal ownership and firm performance does not necessarily imply expropriation. Instead, it is due to a selection effect. Firms are chosen to be in pyramids to undertake lower-profitability projects.

the apex carry out safer investments. If the risky investment is unprofitable, these lower-tier firms can be sold and the group will not lose significant control over other group firms. Pyramids, therefore, can help insulate the entire family group from negative returns and shocks via risk-shifting strategies.

To investigate this issue, we classify the banks into higher- and lower-tier banks. Both types have similar ownership structure in terms of cash flow and voting rights. Nevertheless, we find that higher-tier banks undertook more lower-profitability investments than lower-tier banks. More specifically, on average bottom-tier banks had about 50% more loan growth than top-tier banks and about 21% and 50% lower profitability in terms of ROA and ROE, respectively. To further substantiate our results, we investigate what happened to the upper- and lower-tier banks after the crisis hit Thailand. We find that about 70% of the upper-tier banks survived and remained family owned. In contrast, almost all of the lower-tier banks were either nationalized or sold. Interestingly, even though families have lost control over lower-tier banks and been forced to restructure, the groups have not disappeared. Polsiri and Wiwattanakantang (2006) show that these families still own many companies and have remained wealthy.

Overall, our results contribute to the literature by showing that the locations of firms in a pyramid affect investment strategies and performance. By concentrating risky projects in lower-tier firms, pyramids allow upper-tier firms to minimize negative shocks when those risky investments do not pay off. It is important to note here, however, that while expropriation may not be a primary reason that controlling families set up pyramids, our evidence is not enough to refute the hypothesis that pyramids were used to engage in self-dealing transactions at the expense of minority shareholders.

Following the global financial crisis of 2008-2009, a serious political debate is taking place in emerging markets to determine whether family groups should be allowed to enter the banking sector. Our results also partly contribute to this hot debate by providing an important evidence on how banks and finance companies behave inside a family business group in emerging economies.

The remainder of this paper is organized as follows. In Section 2, we review the existing

literature on pyramids and develop the testable hypotheses. Section 3 describes the data and sample. Section 4 discusses the ownership structure of family groups. Section 5 presents the empirical results. In Section 6, we discuss what happened to banks in different locations in the pyramids after the 1997 financial crisis. Section 7 concludes the paper.

2 Hypothesis development

2.1 Related literature

Extensive studies have emerged in recent years addressing the ambiguities surrounding the creation of business groups, particularly why business groups are typically organized as pyramids. The conventional view argues that pyramids are chosen by the controlling family to maintain or increase its control of several firms within a business group. Pyramids create a separation of ownership from control that induces families to divert resources among the firms at the expense of minority shareholders (e.g., Johnson, La Porta, Lopez-de-Silanes, and Shleifer, 2000; and Morck, Wolfenzon, and Yeung, 2005). A large body of empirical research finds that group firms with a divergence of cash flow rights and control rights have lower firm valuations[3].

The traditional view is challenged by recent empirical findings, however. Many studies shows that in many countries the controlling family owns large cash flow stakes that are more than enough to achieve control of the firms. Pyramids also do not necessarily separate cash flow rights from voting rights. Almeida and Wolfenzon (2006a) provide a detailed discussion and numerous evidence from many countries. For example, Attig, Fischer, and Gadhoum (2003) find that in the case of Canadian firms, the average controlling family owns 31.78% of the cash flow rights. Faccio and Lang (2002), Dermirag and Serter (2003), and Valadares and Leal (1999) find that in the case of firms in Europe, Turkey, and Brazil, the separation of ownership and control is minimal. Similarly, Polsiri and Wiwattanakantang (2006) find that in the case of nonfinancial companies in Thailand, the controlling family owns about 39% of the cash flow rights.

[3] See, e.g., Bertrand, Mehta, and Mullainathan (2002); Claessens, Djankov, Fan, and Lang (2002); Mitton (2002); Lins (2003); Lemmon and Lins (2003); and Joh (2003).

Khanna and Yafeh (2007) and Almeida and Wolfenzon (2006a), among others, raise several questions repudiating the traditional view: What induces outside investors to invest in situations in which their investments are likely to be expropriated? As shown by Faccio, Lang, and Young (2001) and Morck, Strangeland, and Yeung (2000), if the expropriation reflected high dividends or equity prices, why would the controlling family continue to design an ownership structure to maximize it? Does the negative relationship between pyramidal ownership and firm performance always imply expropriation?

A growing body of research has provided other rationales for building pyramids. Numerous studies argue that pyramids create a group's internal capital market (e.g., Shin and Park, 1999; Friedman, Johnson, and Mitton, 2003; Cestone and Fumagalli, 2005; and Almeida and Wolfenzon, 2006a, 2006b). The ability to use the retained earnings of existing group firms allows the controlling family to design their investment strategies. By pooling and transferring funds, group firms can share the costs of low-profit investment. In addition, Khanna and Yafeh (2005) show that internal capital markets provide efficient mutual insurance or risk sharing among group firms, in particular in countries where external financial markets are underdeveloped. This feature is a source of group value that might compensate outside investors for the expropriation risk.

In this study, we extend this analysis by testing whether ownership structure affects group firms' investment decisions. We examine cases in which the separation of ownership and control is insubstantial.

2.2 Hypotheses

We develop our hypotheses based on the argument put forward by Morck and Nakamura (2004). In this study, they analyze the ownership structure of the 10 major zaibatsu family-owned business groups during the pre-World War I period in Japan. Morck and Nakamura argue that the controlling family does not only carefully select what stakes each company should own in other group firms but also each firm's placement within the group. "Core" firms that the family considers important to the group are closer to the apex, while "non-core" firms are lower in the pyramid. This ownership structure facilitates tunneling, as

income and assets can be concentrated in the upper-tier firms. Losses and debts, however, are channeled through the lower-tier firms. For example, in the Mitsui, Mitsubishi, and Sumitomo zaibatsu, banks were considered the core business and hence were near the apex of the pyramid. However, in the Suzuki zaibatsu, the group's bank was not its core firm and hence was deep down in the pyramid. The bank was used to provide loans to other group firms. The bank failed due to high concentration of its loans in the group's firms that encountered financial distress.

We extend this argument by investigating banks' lending decisions. We hypothesize that pyramids can reduce the negative impact on the entire group's net return when the economic environment is unfavorable. Figure 1 illustrates the basic idea. 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 in the second tier, indicating the importance of this bank for the controlling family. In Case 2, Bank Y is in the third tier, indicating that Bank Y is not a core firm for this family. With 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 each case, the expropriation hypothesis suggests that the degree of expropriation by the controlling family should be the same for both Bank X and Bank Y. Hence, Bank X and Bank Y should have similar investment behavior and performance.

However, our hypothesis predicts otherwise. Because the controlling family has a great concern for the stability of the entire group, different firms will be assigned investment projects with different levels of risk. So, in our sample, a bank in a higher tier should pursue less risky investments. As our focus is on lending behavior, our hypothesis suggests that Bank Y is more likely to extend riskier loans. These loans have a higher chance of default. Bank X, which is in a higher tier, is more likely to hold safer loans. Because in "bad" states the return of riskier projects is less than that of safer projects, the return of Bank Y is, therefore, lower than that of Bank X. When the downside of these risky loans is extremely high, the family group can also decide to sell 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 liquidated. Pyramids, therefore, make the entire group less sensitive to negative shocks. It is important to note here, however, that while pyramids can be efficient for the family, they do not necessarily increase social welfare. For example, pyramids can be welfare detracting if the firms that constitute them overinvest.

[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 on the role of family control, we exclude state-owned financial institutions. We also cannot include nonlisted banks and finance companies due to limited data availability. 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 entry patterns within the exchange. The sample coverage accounts for 71.2% of the total assets of the financial sector. Table 1 describes the sample. Thereafter, "banks" will be used to refer to both banks and finance companies in our sample.

It should also be noted that most of the 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 licenses by the central bank. Second, until the financial crisis in 1997, foreign shareholding was limited to 25%.

[Table 1 about here]

3.2 Ownership data

To construct the ownership structures 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 adopt 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 companies' annual reports (FM 56-1). The annual reports are reproduced by the Stock Exchange of Thailand in two databases, the I-SIM CD-ROM and the SETSMART online service. The FM 56-1 file includes shareholders with shareholdings of at least 0.5% and a list of affiliated companies and their shareholdings. We also use the Business On Line (BOL) database to obtain the ownership information of nonlisted companies. BOL is the sole agent with a license from the Ministry of Commerce to reproduce the accounting and ownership information of all companies 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 for businesses to be closely tied to an extensive family. A shareholder, therefore, includes individuals with the same surname as well as extended families linked through marriage. Surnames can be used to trace family relationships 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 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 relationships. Sappaiboon (2000, 2001) provides detailed information on family trees of the top 100 families. For less established families, however, we were unable to trace the relationship beyond the last name and the family information provided in the FM 56-1. Therefore, some of our financial data may underestimate the real value held by such families.

3.3 The pyramidal structure

In the following analysis, we draw the ownership structure to identify which tier banks inhabit within 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 and illustrates how we allocate the firms to each of the pyramidal tiers and calculate cash flow and voting rights. The Ratanarak family forms an enormous pyramid with both financial and nonfinancial companies. The group also owns seven publicly traded firms and is indeed one of the most complicated cases in our sample.

The Ratanaraks own one bank, the Bank of Ayudhya Plc. (BAY), and one finance company, the Ayudhya Investment and Trust Pcl. (AITCO). We focus primarily on these two banks, as they are part of our sample. Both BAY and AITCO are controlled by the Ratanarak family, characteristically through a pyramid of companies that have shares with a variance between cash flow and voting rights.

The Ratanarak family places five holding companies at the apex of the pyramid—the Ratanarak Company, the K Group, the CKR Company, Super Assets, and CKS Holding—to control other companies within the group. Besides these holding companies, the Bangkok Broadcasting & TV Co., Ltd. (BBTV), which operates a military TV channel, is also positioned at the apex. The Ratanaraks directly control 29.3% and indirectly, via CKS Holding, 26.2% of the voting rights of BBTV. Since there are more direct shareholdings than indirect shareholdings, we place BBTV in the first tier. BBTV in turn owns the following three holding companies: Great Luck Equity (30% of the votes), Great Fortune Equity (100% of the votes), and BBTV Asset Management (25% of the votes). So, Great Fortune Equity and BBTV Asset Management are placed in the second tier of the pyramid.

The mechanism the Ratanarak family used to control BAY is not straightforward. The Ratanaraks directly own only a 0.18% stake in BAY. But a control arrangement with 13 group companies gives the family control over 31.6% of voting rights and 21.4% of cash flow rights in BAY. Each of these 13 companies actually owns a small stake that 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 in the second tier.

The Ratanaraks also control another three listed companies in the financial services industry that are in the third tier. We present only the ownership of AITCO because it is a finance company that appears in our sample. The other two companies, Ayudhaya Insurance Plc. (AYUD) and Ayudhaya Jardine CMG Life Plc. (AYUCO), are insurance companies and are not in our sample. The Ratanaraks control 59.63% of the voting rights and 35.45% of the cash flow rights of AITCO. Their direct ownership constitutes only 9.21%. The rest is controlled through a chain of group companies, namely BAY (10%), Super Assets (3.58%), Great Luck Equity (8%), Great Fortune Equity (6.23%), BBTV (7.05%), CKS Holding (5.33%), AYUD (4.1%), and AYUCO (6.13%). We label AITCO in the third tier in the pyramid because its voting rights are concentrated in the second-tier companies, specifically BAY (10%), Great Luck Equity (8%), and 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, accounting for its position near the apex. The group was diversified into financial services and insurance. Another significant expansion was the addition of nonfinancial businesses, namely construction materials. Therefore, the bank is in a high tier, with the other firms filling the lower tiers.

[Figure 2 about here]

4 Empirical analysis

In this section, we investigate how a pyramidal ownership structure affects a bank's lending behavior and its profitability. Our hypothesis asserts that banks near the bottom tiers on the pyramid are more likely to extend risky loans. Therefore, bottom-tier banks will in theory have poorer performance.

4.1 Methodology

4.1.1 Locations of banks in pyramids

We begin this analysis by classifying the banks in our sample based on their location in the pyramid. Table 2A exhibits the results. We observe four tiers in the pyramid. None of the banks was placed in the first tier. Banks were concentrated mostly in the second and third tiers. Only three banks were placed in the fourth tier. Due to the small sample size of the fourth-tier banks, we could not compare the investment activities and performance of the banks by specific tier. Therefore, in the following analysis, we classify the banks into two groups: top tier and bottom tier. A bank is classified in the top tier if it is in the second tier. A bank is classified in the bottom tier if it is located in the third or fourth tier. The top-tier banks account for 33% and the bottom-tier banks 67% of the total sample.

Table 2B shows the ultimate ownership stake of the controlling family. The results based on the whole sample show that the controlling family owned a relatively large stake. The mean voting rights come to 27.7%, while the mean cash flow rights are slightly lower, at 21.2%. The mean deviation of the ownership and control of banks in our sample is 0.73, which is relatively low. 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 ownership by the controlling family is not significantly different between the top-tier and bottom-tier banks.

4.1.2 Definition of risky investments and profitability

Next, we define "risky investments." We consider high loan growth as a sign of risky investment because the banks were operating in the economic downturn of 1992–1996 when there were few "good" lending opportunities. In addition, the financial industry became more competitive due to foreign entries when the market was liberalized during the early 1990s and the offshore banking market, the Bangkok International Banking Facility (BIBF), was set up in 1993. To respond to the economic environment, banks should have sought new profit opportunities and reduced corporate and real estate loans. Many banks, however,

aggressively extended real estate loans. We measure loan growth as the percentage change in total outstanding loans.

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 earnings before taxes to total assets (ROA) and the ratio of net income before extraordinary items to total equity (ROE).

[Table 2A and Table 2B about here]

4.2 Univariate analysis

In this section, we run the univariate tests comparing loan growth, profitability, and other firm characteristics of the top- and bottom-tier banks. Table 3 presents results that strongly support our hypothesis. The bottom-tier banks have higher loan growth and 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 the 20.9% increase for the top-tier banks. As for profitability, the average ROA for the bottom-tier banks is 1.9%, which is significantly lower than the 2.7% of the top-tier banks. Similar results are observed for the ROE.

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

[Table 3 about here]

4.3 Multivariate analysis

4.3.1 Model specification

We employ regression analysis to investigate whether locations in a pyramid affect a bank's lending behavior and profitability. To measure pyramidal tiers, we use a dummy variable "*bottom-tier*" set to one if the bank is in 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 ROA.

In the loan-growth regression, we control for the effect of profitability and risk factors. If higher profitability increases a bank's cash flow, it improves its 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 negatively related to loan growth. Low-capitalized banks may risk more to boost profits by extending loans more aggressively.

In the profitability equation, we include a loan-growth variable to capture the risk effects of loan portfolio on profitability. Compared with other assets, loans are often regarded as more risky. We include squared loan growth to account for any nonlinear 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 risk more to increase profitability. However, the level of capital can be positively related to the bank's profitability due to earnings retention.

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 size. Size is measured by the logarithm of total assets. Theoretically, the relationship between size and loan growth is unclear. Size captures loan-supply conditions. Larger banks often have more branches, allowing them to acquire more deposits and 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*", that 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-invariant variable. We also perform Breusch and Pagan (1980) Lagrange multiplier tests to examine whether errors are independent (OLS vs. random effects).

4.3.2 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 in the bottom tiers tend to pursue a more aggressive lending policy than banks in 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 is statistically significant. The results support our hypothesis that location in the pyramids does matter in explaining the variation in loan growth.

Regarding the control variables, the coefficients are as expected. 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 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]

4.3.3 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 one 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 are as expected. The results indicate that larger banks are more profitable than smaller banks. We find a strong relationship between capital ratio and profitability. Concerning 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 lower in the pyramids perform worse than those near the apex. The magnitude of the estimates indicates that the difference in profitability between lower- and higher-tier banks is economically significant. Lower-tier banks experience ROA of about 1 percentage point lower than top-tier banks. This difference in ROA is remarkable, as it indicates a profitability gap of more than 21% over the average bottom-tier bank's ROA of 1.9%. Making risky loans may be one of the reasons bottom-tier banks perform more poorly than higher-tier banks. Our empirical results indicate that banks in the bottom tiers extend about 9.5 percentage points more loans than top-tier banks. This 9.5 difference represents about 48.3% of the average bottom-tier bank's 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 risky.

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

risk more and hence end up performing more poorly than upper-tier banks. 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]

4.3.4 Robustness checks

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

Alternative measures of performance

To test whether our results are robust compared with alternative profitability measures, we use ROE in lieu of ROA. ROE is defined as the ratio of net income before extraordinary items to 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 8.4 percentage points lower ROE than top-tier banks. In unreported results, we repeated the analysis using the net interest margin as an alternative measure of a 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 growth 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 identify the equations system, 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 compared with those of 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 for the ROA and at the 5% level for the ROE. The estimates from the 2SLS regressions are also close 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: only finance companies

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

[Table 6 and Table 7 about here]

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

In this section, we investigate what happened to the banks after the 1997 financial crisis. If banks located in lower tiers undertook risky loans, lower-tier banks were more likely to be hit harder by the crisis and hence would be in financial trouble. We define a bank as failed if it was either closed down or nationalized by the government. Table 8 shows the number of banks in 2003 compared with the number in 1996. Banks were categorized based on their placement in the pyramids. Interestingly, we find that the survival rate of banks in higher tiers is significantly higher. Statistically, about 70% of the banks in the second tier survived. In contrast, only about 10% of the third-tier banks survived. The extreme cases are the fourth-tier banks. None of the three banks in the fourth tier survived. This finding is consistent with the view that the controlling shareholder expropriates minority shareholders by tunneling resources from lower-tier firms. In our analysis, we show that the tunneling is via allocating risky investment projects to lower-tier banks.

It appears that after the crisis, many business groups were dramatically restructured. Polsiri and Wiwattanakantang (2006) show 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 Ratanaraks decided to remain more focused on the financial services business, which was the family's original strength. Therefore, the Ratanaraks relinquished their controlling stake in noncore businesses, namely Siam Cement City Pls. (SCCC), Karat Sanitaryware Plc. (KARAT), and many other nonlisted companies in the construction materials business. The funds from selling stakes in these companies were used to save core businesses in the financial services industry, in particular the Bank of Ayudhya (BAY).

[Table 8 about here]

6 Conclusion

This paper investigates family-owned banks in Thailand. We begin our analysis by examining the ownership structure of banks and nonfinancial firms that have the same ultimate owner. Our investigation shows that some wealthy families own an extensive empire that includes banks and other nonfinancial firms in various industries. The mechanisms that the families use to control these firms are pyramids. We find that on average families set up pyramids of four tiers. A number of holding companies were placed at the apex. These holding companies controlled other firms in the family group. About one-third of the banks in our sample were in the second tier in the pyramids, categorized as "top-tier banks". The other two-thirds were in the third and fourth tiers, classified as "bottom-tier banks."

We find that bottom-tier banks tend to extend more loans and perform more poorly. This suggests that bottom-tier banks undertake risky investments. We show that these results are robust compared with those of different measures of performance and regression methods. Interestingly, we find that while most top-tier banks survived after the crisis, most lower-tier banks failed.

This evidence is consistent with the notion that the controlling shareholder chooses not

only what stakes to hold in each firm but also where to place the firms in the pyramids. In addition, we show that location in the pyramids is indeed relevant, as the controlling shareholder can choose different investment strategies for each firm. While "good investment" is concentrated in upper-tier firms, lower-tier firms are more likely to engage in risky investment. This ownership setting, therefore, can insulate the entire group from the adverse effect in "bad states" if an investment does not pay off, in which case the controlling family is able to maintain control over the other firms by selling poorly performing firms in the lower tiers.

We surmise that the regulatory authorities should not only look at the feasibility of extending banking licenses to the family groups; the control framework should also look at where the banks or the finance companies will be placed in the pyramid structure and how much direct control the owners exercise on the banks owned by the group.

References

Almeida, Heitor, and Daniel Wolfenzon, 2006a, Should business groups be dismantled? The equilibrium costs of efficient internal capital markets, *Journal of Financial Economics* 79, 99–144.

——— , 2006b, A theory of pyramidal ownership and family business groups, *Journal of Finance* 61, 2637–2681.

Attig, Najah, Klaus Fischer, and Yoser Gadhoum, 2003, On the determinants of pyramidal ownership: Evidence on expropriation of minority interests, mimeo.

Bertrand, Marianne, Paras Mehta, and Sendhil Mullainathan, 2002, Ferreting out tunneling: An application to Indian business groups, *Quarterly Journal of Economics* 117, 121–148.

Breusch, Trevor, and Adrian Rodney Pagan, 1980, The lagrange multiplier test and its applications to model specification in econometrics, *Review of Economic Studies* 47, 239–253.

Brooker Group, 2001, *Thai Business Groups 2001: A Unique Guide to Who Owns What* (The Brooker Group: Bangkok).

Caprio, Gerard, Luc Laeven, and Ross Levine, 2007, Governance and bank valuation, *Journal of Financial Intermediation* 16, 584–617.

Cestone, Giacinta, and Chiara Fumagalli, 2005, The strategic impact of resource flexibility in business groups, *RAND Journal of Economics* 36, 193–214.

Charumilind, Chutatong, Raja Kali, and Yupana Wiwattanakantang, 2006, Connected lending: Thailand before the financial crisis, *Journal of Business* 79, 181–218.

Claessens, Stijn, Simeon Djankov, Joseph P. H. Fan, and Larry H. P. Lang, 2002, Disentangling the incentive and entrenchment effects of large shareholdings, *Journal of Finance* 57, 2741–2771.

Claessens, Stijn, Simeon Djankov, and Larry H. P. Lang, 2000, The separation of ownership and control in East Asian corporations, *Journal of Financial Economics* 58, 81–112.

Demirag, Istemi, and Mehmet Serter, 2003, Ownership patterns and control in Turkish listed companies, *Corporate Governance* 11, 40–51.

Faccio, Mara, and Larry H. P. Lang, 2002, The ultimate ownership of Western European corporations, *Journal of Financial Economics* 65, 365–395.

——— , and Leslie Young, 2001, Dividends and expropriation, *American Economic Review* 91, 54–78.

Friedman, Eric, Simon Johnson, and Todd Mitton, 2003, Propping and tunneling, *Journal of Comparative Economics* 31, 732–750.

Hanazaki, Masaharu, Jung Wook Shim, Toshiyuki Souma, and Yupana Wiwattanakantang, 2006, Do large shareholders monitor or collude with banks in Japan?, mimeo.

Joh, Sung Wook, 2003, Corporate governance and firm profitability: Evidence from Korea before the economic crisis, *Journal of Financial Economics* 68, 287–322.

Johnson, Simon, Rafael La Porta, Florencio Lopez-de-Silanes, and Andrei Shleifer, 2000, Tunneling, *American Economic Review Papers and Proceedings* 90, 22–27.

Khanna, Tarun, and Yishay Yafeh, 2005, Business groups and risk sharing around the world, *Journal of Business* 78, 301–340.

——— , 2007, Business groups in emerging markets: Paragons or parasites?, *Journal of Economic Literature* 45, 331–373.

La Porta, Rafael, Florencio Lopez-de-Silanes, and Andrei Shleifer, 1999, Corporate ownership around the world, *Journal of Finance* 54, 471–518.

La Porta, Rafael, Florencio Lopez-de-Silanes, and Guillermo Zamarripa, 2003, Related lending, *Quarterly Journal of Economics* 118, 231–268.

Lemmon, Michael L., and Karl V. Lins, 2003, Ownership structure, corporate governance, and firm value: Evidence from the East Asian financial crisis, *Journal of Finance* 58, 1445–1468.

Lins, Karl V., 2003, Equity ownership and firm value in emerging markets, *Journal of Financial and Quantitative Analysis* 38, 159–184.

Mitton, Todd, 2002, A cross-firm analysis of the impact of corporate governance on the East Asian financial crisis, *Journal of Financial Economics* 64, 215–241.

Molyneux, Philip, Eli Remolona, and Rama Seth, 1998, Modeling foreign bank performance, and lending behavior, *Financial Markets, Institutions, and Instruments* 7, 26–41.

Morck, Randall, and Masao Nakamura, 2004, A frog in a well knows nothing of the ocean: A history of corporate ownership in Japan, in Randall Morck, ed.: *A Global History of Corporate Governance* (University of Chicago Press: Chicago).

Morck, Randall, David Stangeland, and Bernard Yeung, 2000, Inherited wealth, corporate control, and economic growth?, in Randall Morck, ed.: *Concentrated Corporate Ownership* (University of Chicago Press: Chicago).

Morck, Randall, Daniel Wolfenzon, and Bernard Yeung, 2005, Corporate governance, economic entrenchment, and growth, *Journal of Economic Literature* 43, 655–720.

Polsiri, Piruna, and Yupana Wiwattanakantang, 2006, Thai business groups: Crisis and restructuring, in Sea-Jin Chang, ed.: *Business Groups in East Asia: Financial Crisis, Restructuring, and New Growth* (Oxford University Press: Oxford).

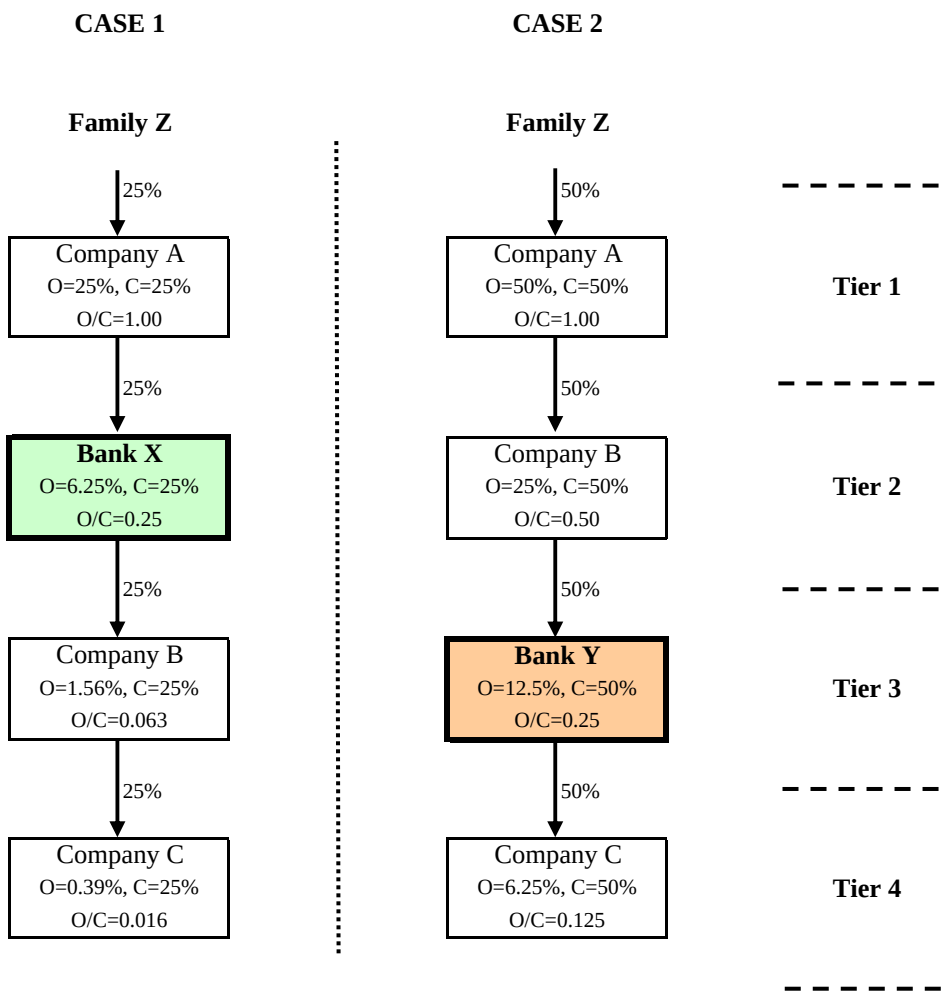
Sappaiboon, Thanawat, 2000, *The Fifty-Five Most Well-known Families: Version 1* (Nation Multimedia Group: Bangkok) in Thai.

——— , 2001, *The Fifty-Five Most Well-known Families: Version 2* (Nation Multimedia Group: Bangkok) in Thai.

Shin, Hyun-Han, and Young S. Park, 1999, Financing constraints and internal capital markets: Evidence from Korean chaebols, *Journal of Corporate Finance* 5, 169–191.

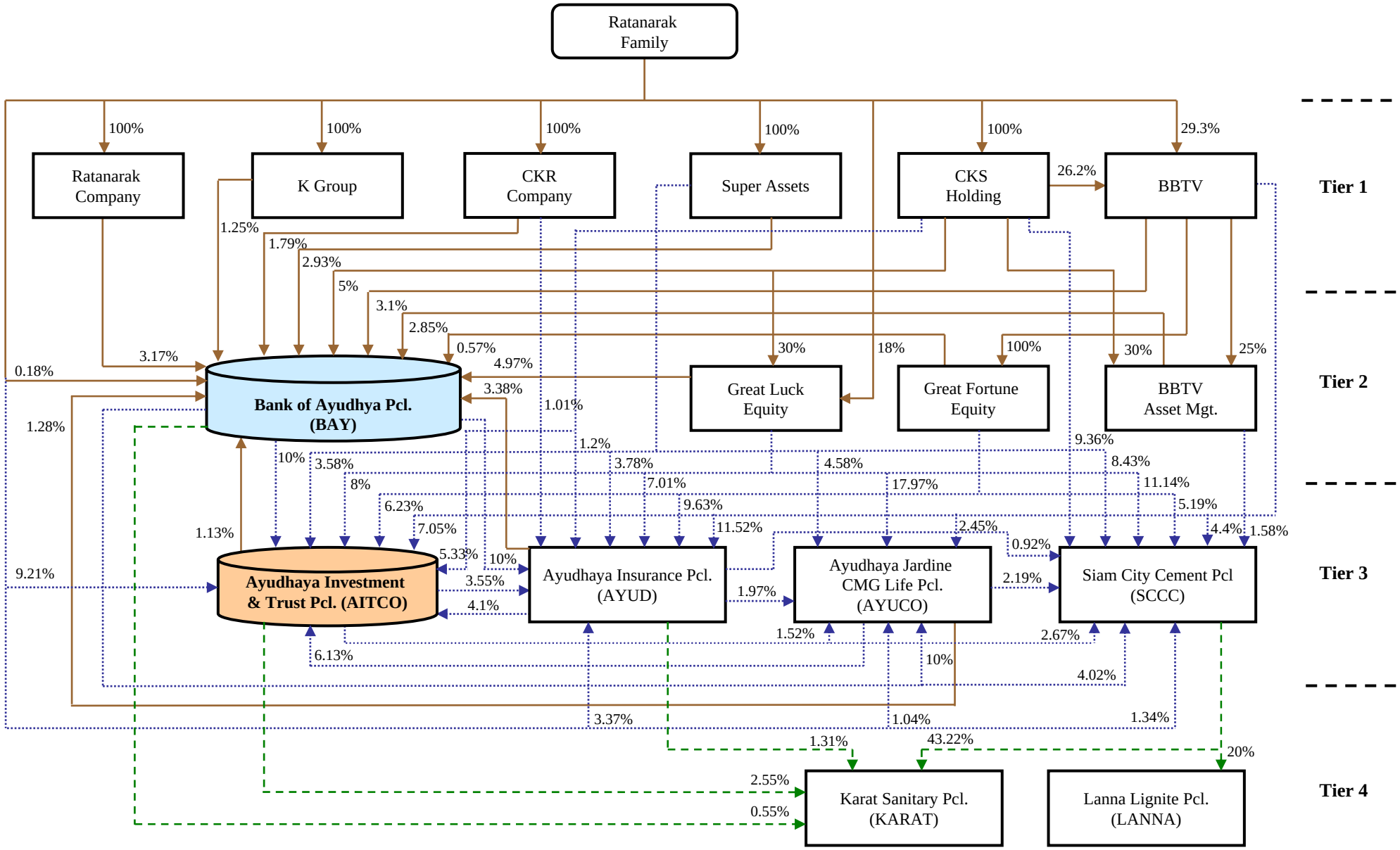
Valadares, Silvia M., and Ricardo Leal, 1999, Ownership and control structure of Brazilian companies, *Revista ABANTE* 3, 29–56.

Figure 1: Pyramids



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 2A: 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 2B: Ownership structure

The table reports the ownership structure according to which tiers in the pyramid the banks are located.

		Cash-flow rights (O)	Control rights (C)	Cash-flow rights/ Control rights (O/C)
All banks	Mean	21.2%	27.7%	0.73
	Median	19.3%	28.2%	0.78
	Std. Dev.	13.5%	12.5%	0.25
Top tier banks	Mean	23.3%	28.9%	0.76
	Median	21.2%	30.7%	0.79
	Std. Dev.	14.8%	13.3%	0.20
Bottom tier banks	Mean	20.3%	27.1%	0.71
	Median	18.9%	25.7%	0.78
	Std. Dev.	12.8%	12.0%	0.27
Difference in mean [Top - Bottom]		3.0%	1.8%	0.04
t -statistics (*t* -test)		(1.55)	(1.01)	(1.20)
Difference in median [Top - Bottom]		2.3%	5.0%	0.01
z -statistics (Wilcoxon rank-sum test)		(1.21)	(1.00)	(1.00)

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. Loan growth is defined as the one-year growth rate of the total outstanding loan. ROA is defined as earnings before taxes divided by total assets. ROE is defined as net income before extraordinary items divided by total equity. Log(total assets) is the logarithm of total assets. Capital/total assets is defined as total equity divided by total assets. Loans/total assets is defined as total loans outstanding divided by total assets. *, **, 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	0.125	0.191	-0.066	-2.91***	-4.31***
	[Median]	[0.122]	[0.186]	[-0.064]		
Log (total assets)	Mean	4.420	4.809	-0.389	-5.25***	-4.24***
	[Median]	[4.337]	[4.731]	[-0.394]		
Capital/total assets	Mean	0.104	0.099	0.005	0.89	0.97
	[Median]	[0.095]	[0.089]	[0.006]		
Loans/total assets	Mean	0.811	0.822	-0.011	-1.33	-1.58
	[Median]	[0.829]	[0.833]	[-0.004]		

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 taxes 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 return on assets (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 taxes 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/100		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 return on equity (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 net income before extraordinary items 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	-0.084**	-0.082**	-0.084**	-0.086***	-0.085***	-0.086***
	(-2.34)	(-2.31)	(-2.34)	(-3.28)	(-3.14)	(-3.26)
Cash flow rights/100		0.021			0.025	
		(0.59)			(0.27)	
Cash flow rights/control rights			-0.011			-0.010
			(-0.48)			(-0.20)
Size	0.064***	0.066***	0.062***	0.065**	0.067**	0.062*
	(3.41)	(3.41)	(3.12)	(1.99)	(1.97)	(1.78)
Capital/total assets	-0.086	-0.099	-0.072	-0.193	-0.211	-0.188
	(-0.51)	(-0.58)	(-0.41)	(-0.55)	(-0.59)	(-0.53)
Loan growth	0.310	0.310	0.310	0.314***	0.314***	0.314***
	(1.42)	(1.41)	(1.42)	(2.62)	(2.62)	(2.61)
Loan growth-squared	-0.193	-0.194	-0.193	-0.200*	-0.202*	-0.201*
	(-1.06)	(-1.06)	(-1.06)	(-1.87)	(-1.88)	(-1.87)
Finance company	0.114**	0.115**	0.111**	0.122***	0.123***	0.119***
	(2.32)	(2.32)	(2.29)	(3.08)	(3.08)	(2.80)
Constant	-0.308**	-0.322**	-0.285**	-0.304*	-0.320*	-0.284
	(-2.54)	(-2.52)	(-2.22)	(-1.69)	(-1.67)	(-1.36)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	204	204	204	204	204	204
Adjusted R-squared	0.268	0.268	0.268	0.267	0.267	0.340
p -value of Breusch and Pagan Lagrangian multiplier test				0.012**	0.012**	0.013**

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 taxes divided by total assets. ROE is defined as net income before extraordinary items 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***	-0.065**	-0.064**	-0.065**
	(1.97)	(2.09)	(1.98)	(-3.06)	(-2.96)	(-3.08)	(-2.55)	(-2.48)	(-2.53)
Cash flow rights/100		0.176			0.003			0.011	
		(1.57)			(0.32)			(0.13)	
Cash flow rights/control rights			0.040			-0.003			-0.004
			(0.60)			(-0.60)			(-0.07)
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	0.242	0.238	0.238
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 was failed if it was either closed down or nationalized as of 2003.

	Pre-crisis (as of 1996)	Post-crisis (as of 2003)			
		Survived		Failed	
		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%