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การเมืองของบริษัทต่างๆ สามารถพบได้ทั่วไป ตัวแปรด้านการเงินและด้านเศรษฐกิจที่ใช้กันอย่าง
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สถาบันการเงินทุกแห่งในประเทศไทยที่มีการดำเนินงานในช่วงปีพ.ศ. 2534 ถึงปีพ.ศ. 2540 จากนั้น
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การเงินที่ใช้กันอย่างมากในงานวิจัยที่ผ่านมา แบบจำลองของผู้วิจัยยังเพิ่มตัวแปรด้านโครงสร้างการ
ถือหุ้นและสายสัมพันธ์ทางการเมืองเข้ามาด้วย ผลการศึกษาแสดงให้เห็นว่า ลำพังปัจจัยด้านการเงิน
อาจไม่เพียงพอที่จะสร้างแบบจำลองทำนายความล้มเหลวที่มีประสิทธิภาพได้ ดังนั้นจึงต้องใช้
ปัจจัยด้านโครงสร้างการถือหุ้นและสายสัมพันธ์ทางการเมืองเพิ่มด้วย ซึ่งแบบจำลองของผู้วิจัย
สามารถทำนายความล้มเหลวของสถาบันการเงินได้ถูกต้อง 86.25%, 87.27%, 84.87%, 80.36%
และ 79.82% โดยใช้ข้อมูลในช่วง 1 ปี, 2 ปี, 3 ปี, 4 ปี และ 5 ปีก่อนที่สถาบันการเงินจะปิดตัวลง

ตามลำดับ ผู้วิจัยค้นพบด้วยว่า สถาบันการเงินที่ควบคุมโดยนักลงทุนต่างประเทศมีโอกาสล้มน้อย
กว่าสถาบันการเงินอื่นๆ ข้อค้นพบนี้สนับสนุนการตรวจสอบผู้บริหารกิจการที่มีประสิทธิภาพของผู้
ถือหุ้นต่างชาติผู้มีอำนาจควบคุม และ/หรือคุณภาพในการบริหารที่สูงกว่าของสถาบันการเงินที่
ควบคุมโดยนักลงทุนต่างประเทศ ในทำนองเดียวกัน ยิ่งสิทธิในการลงคะแนนเสียงของผู้ถือหุ้นราย
ใหญ่ที่สุดของสถาบันการเงินยิ่งสูง โอกาสที่สถาบันการเงินจะล้มยิ่งต่ำ ข้อค้นพบนี้เป็นหลักฐานที่
แสดงถึงบทบาทของผู้ถือหุ้นรายใหญ่ในการตรวจสอบผู้บริหารกิจการ รวมทั้งยังสนับสนุน
สมมติฐานที่ว่า ยิ่งผู้ถือหุ้นรายใหญ่ถือหุ้นมากเท่าไร ผลประโยชน์ของเขาและผลประโยชน์ของผู้
ถือหุ้นอื่นๆ จะยิ่งสอดคล้องกันมากขึ้นเท่านั้น ซึ่งจะทำให้ผู้ถือหุ้นรายใหญ่ขาดแรงจูงใจที่จะตักตวง
ทรัพยากรของกิจการเพื่อประโยชน์ส่วนตน นอกจากนี้ผู้วิจัยพบว่า สายสัมพันธ์กับสำนักงาน
ทรัพย์สินส่วนพระมหากษัตริย์ทำให้ความน่าจะเป็นที่สถาบันการเงินจะถูกปิดลดลง ในขณะที่สาย
สัมพันธ์ทางการเมืองผ่านตระกูลผู้ถือหุ้นผู้มีอำนาจควบคุมและผ่านรัฐบาล ไม่มีความสำคัญเชิงสถิติ
ต่อโอกาสที่สถาบันการเงินจะล้ม และข้อค้นพบสุดท้าย ได้แก่ หลักฐานเกี่ยวกับนโยบาย "ใหญ่
เกินไปที่จะล้ม" ในกระบวนการสั่งปิดสถาบันการเงินในช่วงวิกฤติเศรษฐกิจเอเชียตะวันออก
กล่าวคือผู้วิจัยพบว่า สถาบันการเงินขนาดใหญ่มีโอกาสที่จะถูกปิดกิจการน้อยกว่าสถาบันการเงิน
ขนาดเล็ก

Title of Research: Ownership Concentration, Political Connection, and Financial Institution Failure

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Abstract

In an emerging economy where ownership concentration and political connection are common, widely documented financial and economic factors might not have been sufficient in constructing sound models to predict financial institution failures. Predicting failures of individual financial institutions can have a significant impact on the economy. To serve as an efficient early warning signal, the accuracy of a failure prediction model is as important as its robustness over time to failure. In this study, we collect the data of all financial institutions operating in Thailand for the period 1991-1997. Then we develop failure prediction models using logistic regression for the financial institutions during the 1997 East Asian financial crisis. Unlike previous studies, our models incorporate ownership structure, political connection, as well as financial factors as failure predictors. We show that only traditional financial variables might not be sufficient to produce models with good predictive power. It is better to be complemented by ownership structure and political connection variables to generate sound prediction models with the robustness over time. Specifically, in our logistic models, 86.25%, 87.27%, 84.87%, 80.36%, and 79.82% of financial institutions are correctly classified in the models using the data of one, two, three, four, and five years prior to failure, respectively. We also find that financial institutions controlled by foreign investors are less likely to fail. This result supports the argument that foreign controlling shareholders are active monitors of the management, and/or the argument that foreign owned financial institutions have

higher management quality. In addition, control rights held by the largest shareholder appears to be negatively related with the probability that a financial institution fails. The result provides evidence for the monitoring effects of controlling shareholders, and also the interest alignment hypothesis of large and other shareholders. Moreover, political connection with the Crown Property Bureau reduces the failure likelihood of the financial institutions. However, political connections via controlling families and the state play an insignificant role in determining the failure likelihood. Finally, our results suggest evidence of "too-big-to-fail" policies in the closure procedures of Thai financial institutions during the East Asian financial crisis.

Chapter 1
Introduction

Predicting corporate failures can contribute significantly to the economy. Early-warning systems developed from failure prediction models have proven to reduce the chance that a company gets into financial distress or even goes bankrupt. This should in turn prevent the systemic collapse of a country's economy.

A good example that a lack of effective early warning systems could lead to a catastrophe of the history is the breakdown of the Thai financial and banking sector in 1997-1998. During the recent East Asian economic crisis, 58 out of 91 finance companies were suspended in the second half of 1997, and a further 12 finance companies in 1998. After all, 56 finance companies were closed in 1997. In relation to banking, six banks were suspended in 1998, followed by one more in 1999. Out of the 15 domestic banks operating in 1994, one was closed down, three were merged into government owned banks, two were taken over by the government and three became foreign owned during the crisis. The remaining banks have been struggling to recapitalize on their own.

Even though the main origin of the East Asian financial crisis is not a lack of sound early warning systems, the adverse impacts of the crisis might have been lower if Thailand had such effective systems. On the bright side, however, the economic crisis enables us to examine failure prediction models for financial institutions in an emerging market economy, which we believe only little evidence has been provided.

Most of previous research on the causes and origins of the East Asian crisis (and other economic crises) has mainly studied the macroeconomic factors that may help predict financial and/or currency crises (see for example, Kaminsky, Lizondo, and Reinhart (1997), Eichengreen and Rose (1998), Furman and Stiglitz (1998), Radelet and Sachs (1998), Kaminsky and Reinhart (1999), Demirguc-Kunt and Detragiache (2000)). Although the early warning systems using macroeconomic variables are effective in timely detecting systemic crises, they do not recognize the contribution of firm-level weaknesses to the incidence of the crisis. In other words, macroeconomic analyses are "unlikely to be able to discriminate between the view that distressed financial institutions were hit by exogenous shocks and the view that

many weaknesses before the crisis may have led to the systemic financial distress." (Bongini, Claessens, and Ferri (2001), p. 7) Hence, early warning systems using firm-level or microeconomic data should be worth developing. This is one of the main objectives of our paper.

Our study also relates to the literature on predicting distress and failure/ bankruptcy of financial institutions (during an economy-wide crisis). Models attempting to predict the distress and failure of individual financial institutions (i.e., early warning systems) have been developed since the 1970s. Mostly applied to banking and financial sectors in developed countries, these models emphasize on early identifying financial institutions that are potentially financially troubled and may fail.

Other than the opportunity to develop prediction models of financial institution failure during the East Asian crisis, Thai financial institutions are also of interest due to their concentrated ownership structure. Such a characteristic is common among most of economies around the world, but different from the US where extensive research on failure prediction has been conducted.

The conflicts of interests between the firms' controlling shareholders and minority shareholders have been crucially discussed at least since the analysis of La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1999), Claessens, Djankov, and Lang (2000), and Faccio and Lang (2002) who show that concentrated ownership is universal around the world. Moreover, La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997, 1998, and 2000), Johnson, La Porta, Lopez-de-Silanes, and Shleifer (2000), and Burkart, Panunzi, and Shleifer (2003) show that legal protection of minority shareholders varies across countries, and this variation determines the level of the ownership concentration, the existence of family firms worldwide, the patterns of separation between ownership and management, and the degree of expropriation by corporate insiders. In countries with moderate legal protection of outside investors, a controlling shareholder can be beneficial to the firm as an active monitor (Anderson and Reeb (2003), Burkart, Panunzi, and Shleifer (2003), and Morck and Yeung (2003)).

However, in emerging economies where legal and regulatory systems are weak, a controlling shareholder is likely to expropriate the firm's resources. Under some circumstances, for example when firms are doing well, controlling shareholders may tunnel resources out of the firms for their own benefits (Johnson, Boone, Breach,

and Friedman (2000), Johnson, La Porta, Lopez-de-Silanes, and Shleifer (2000), Bertrand, Mehta, and Mullainathan (2002), and Morck and Yeung (2003)).

To investigate the expropriation effects empirically, the literature typically has concentrated on linking ownership and performance (for example, Khanna and Palepu (2000b), Wiwattanakantang (2001), Claessens, Djankov, Fan, and Lang (2002), Mitton (2002), Anderson and Reeb (2003), Attig, Fischer, and Gadhoum (2003), Joh (2003), Lemmon and Lins (2003), Lins (2003), Baek, Kang, and Park (2004)). In addition, to study the expropriation effects, a number of studies choose to focus on the East Asian crisis (Johnson, Boone, Breach, and Friedman (2000), Claessens, Djankov, Fan, and Lang (2002), Mitton (2002), and Baek, Kang, and Park (2004)). In this study, we focus on a single country, Thailand that provides a natural setting to study this issue.

Rather than examining the relation between ownership concentration and firm performance, our methodology is to investigate the effects of ownership concentration on the likelihood of business failure. In addition, unlike most of existing research on failure/bankruptcy prediction models that use only financial variables, our models also incorporate ownership concentration variables.[1]

Last but not least, political connection has proven to have an important impact on firms, especially in emerging economies. For example, Fisman (2001), Johnson and Mitton (2003), Cheung, Jing, Rau, and Stouraitis (2005), Leuz and Oberholzer-Gee (2006), Mobarak and Purbasari (2006), Ferguson and Voth (2008), and Bunkanwanicha and Wiwattanakantang (2009) show that shareholders in firms with close ties to governments benefit from political connections. Politically connected firms tend to have a superior access to debt financing (Chiu and Joh (2004), Sapienza (2004), Cull and Xu (2005), Dinc (2005), Khwaja and Mian (2005), Faccio (2006), and Charumilind, Kali, and Wiwattanakantang (2006)). Political connection also plays an important role in determining the likelihood with which firms will be rescued by the government through the IMF or World Bank financial assistance during an economic crisis (Faccio, Masulis, and McConnell (2007)). Hence, political connection should also affect the probability that firms will go bankrupt or be closed. However, as far as we concern, no existing research has studied how political

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[1] Not until recently have studies documented significant effects of ownership variables on the probability of failure/bankruptcy (Bongini, Claessens, and Ferri (2001) and Dewaelheyns and Van Hulle (2004)) or financial distress (Claessens, Djankov, and Klapper (2003) and Lee and Yeh (2004)).

connection affects the likelihood of financial institutions' failure/closure the way we do in this study.

We use the data of all financial institutions (i.e., listed and non-listed) that have been operating in the period 1991-1997 to develop failure prediction models for financial institutions during the 1997 East Asian economic crisis. The technique we employ here is a popular statistical approach, namely a logistic regression. The intention is that we attempt to test predictive power of our developed models and investigate whether ownership structure and political connection factors help determine the likelihood of financial institution failures during the economic crisis.

Our models suggest that traditional financial variables based on the CAMEL analysis appear to perform relatively well in predicting financial institution failure.[2] The variables related to capital adequacy, management quality, asset quality, and earnings ability show some significant results. That is, higher loan growth increases the likelihood that a financial institution fails; the operating expenses to revenue ratio, return on assets and interest income to total income ratio have negative effects on the probability of failure. The impact of the operating expenses to revenue ratio is rather surprising.

The ownership structure variables have also proven to play an important role in determining the probability with which a financial institution fails. Specifically, we find that financial institutions in which a foreign investor is the largest shareholder are less likely to fail, suggesting the monitoring effects of a foreign controlling shareholder and high management quality of foreign-controlled financial institutions. Likewise, a higher fraction of voting rights held by the largest shareholder reduces the probability of business failure, suggesting greater incentives of a large shareholder to monitor managerial decisions and actions, and the alignment of interests between large and other shareholders, which reduces the expropriation of minority shareholders by a large shareholder.

Regarding political connection, only the Crown Property Bureau connection appears to be significant in determining the likelihood of financial institution failures in Thailand.[3] More precisely, the financial institutions that belong to the Crown Property Bureau are less likely to fail during the crisis. On the other hand, political

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[2] CAMEL stands for Capital adequacy, Asset and Management quality, Earnings, Liquidity.

[3] The Crown Property Bureau is a Thai government agency responsible for managing the personal wealth of the King of Thailand and his immediate family.

connections via controlling families and the state play an insignificant role in determining the failure likelihood. Finally, we find evidence of "too-big-to-fail" policies in the closure process of Thai financial institutions.

Overall, our failure prediction models that incorporate ownership concentration and political connection variables, along with financial variables show high accuracy rates, which are robust across time to failure. These results thus indicate that the models can serve as efficient early warning systems.

The rest of the study is structured as follows. Chapter 2 reviews how the East Asian crisis affects the Thai economy, especially the banking and financial sector. It also describes the impacts of ownership concentration, political connection and financial factors on the likelihood of financial institution failures, and provides a brief overview of failure/bankruptcy prediction models applied in the existing literature. Chapter 3 discusses data, variables, and methodology used in this study. Chapter 4 examines the empirical results from our developed failure prediction models. Finally, Chapter 5 concludes the study and gives suggestions for future research.

Chapter 2
Literature Review

This chapter reviews the literature relevant to the present study. The review can be divided into three sections. First, we give an overview about the East Asian economic crisis and its impact on the Thai financial sector. Then, we discuss the effects of concentrated ownership and political connection on the probability of corporate failure. Next, we investigate how some financial ratios, especially the CAMEL-based financial ratio, have been used in predicting the likelihood of financial institution failure. Such ratios will be used as explanatory variables in our prediction models. Finally, we describe the prediction models that are extensively documented, focusing on a logistic regression.

2.1 The East Asian economic crisis and Thailand

There are extensive studies addressing the causes of the 1997 East Asian financial crisis (e.g., Corsetti, Pernti, and Roubini (1998), Krugman (1998), Radelet and Sachs (1998), Department of Foreign Affairs and Trade (2000), and Siamwalla (2001)). It is generally believed that hasty financial liberalization without establishing a comprehensive regulatory and supervisory framework, macroeconomic mismanagement by the government, large foreign short term debt, and inadequate corporate governance and prudential regulations in the private sector were factors underlying the problems of the Thai economy. Financial liberalization during the end of the 1980s until the beginning of the 1990s is often regarded as one of the major causes of the crisis. In particular, the BIBF that was set up in 1993 to serve as an intermediary between overseas lenders and local borrowers turned out to facilitate foreign dominated loans for both financial and non financial companies. Most of the loans were not hedged from the lenders' expectations of continued exchange rate stability.

The growing mismatch in the currency denomination of banks' assets and liabilities was thought as one of the major causes of the banking crisis in 1996 and 1997 (Kawai and Takayasu (2000) and Siamwalla (2001)). Specifically, banks used deposits and short term unhedged foreign currency loans to lend long term loans in domestic currency. In addition, Thai banks and finance companies had many poor

quality loan portfolios due to risky lending which were based on collateral and connection (Krugman (1998) and Charumilind, Kali, and Wiwattanakantang (2006)). The underlying problem that enabled these lending practices to occur was systematic failure of risk management systems and prudential controls. When exports, the real estate and stock markets fell in 1996, many financial institutions became insolvent with a huge amount of non performing loans. It was clear in 1996 that many finance companies and one bank, the Bangkok Bank of Commerce (BBC) were in financial trouble due to their exposure to real estate loans (Siamwalla (2001)). The failure of the Thai government in dealing with the problems in the financial sector precipitated the crisis in Thailand (Nukul Commission (1998) and Flatters (1999)).

At the same time as the banking crisis, an increasingly severe attack against the baht happened (Siamwalla (2001)). In response, massive capital fights began in the late 1996 until July 2, 1997, when the country's foreign exchange reserves exhausted. In August 1997, the government signed the first Letter of Intent requesting for the IMF assistance.

The depreciation of baht and the increase in interest rates had immediate negative effects of the cash flow of non financial companies that had high short term unhedged foreign dominated loans but held long term baht dominated assets. All of these developments aggravated liquidity and solvency problems in the financial industry. As a consequence, about one third of financial institutions became insolvent.

The IMF program included two major components: stabilize the macro economy and restore financial market stability (Flatters (1999), Department of Foreign Affairs and Trade (2000), and Kawai and Takayasu (2000)). It dealt with measures to improve economic governance and competitiveness of Thai industries, developing social safety nets, and reforming and rehabilitating the financial sector to avoid the system collapse (Flatters (1999)). To increase confidence in the banking industry, the government provided a blanket guarantee for depositors. To restore the effectiveness of the financial industry and increase financial sector transparency and competition, the government strengthened prudential regulations, loan classification and capital adequacy. In 1997 and 1998, several emergency amendments to the Bank of Thailand, commercial banking and finance company laws were passed to enable the Bank of Thailand to intervene promptly with non-viable financial institutions.

Financial sector reforms went with bank and finance company closures and nationalization. In addition, in order to assist financial sector recapitalization, the

government also remodeled the financial sector environment by increasing the foreign ownership limit of banks and finance companies from 25% to 100% for the next ten years. The August 1998 package of Baht 300 million was introduced to expedite financial institution recapitalization. Under this scheme, financial institutions that meet specified prudential conditions received public fund injections. To assist finance companies to write off their bad loans, the government set up the Asset Management Corporation.

By the end of 2000, out of 91 finance companies as of 1996, 71 were closed down. As for banks, out of 15 domestic banks as of 1996, four were closed down, two were taken over by the government and four banks had majority foreign ownership (Aunichitworawong, Souma, and Wiwattanakantang (2003)). Most financial institutions that have survived were recapitalizing by obtaining direct equity investments from foreign partners and issuing shares and capital securities.

Table 2-1 presents the ownership of banks in 1996 and 2000. Interestingly, before the crisis the largest shareholder of 12 out of 15 Thai commercial banks that operated was either a single family or a group of families (see also Aunichitworawong, Souma, and Wiwattanakantang (2003) and Polsiri and Wiwattanakantang (2006)). The largest shareholders of seven banks were the top 30 business group families. These banks are namely Bangkok Bank, Siam Commercial Bank, Bank of Ayudhya, Thai Farmers Bank, First Bangkok City Bank, Bangkok Metropolitan Bank, and Siam City Bank. However, after the crisis four families lost the control over the banks. First Bangkok City Bank, an affiliation of the Siriwattanapakdi family was among the four banks that were closed down in 1998. Bangkok Metropolitan Bank (of the Techapaibul/Euawattanasakul family) and Siam City Bank (of the Srifuengfung/Panichiwa family) were in financial distress and therefore were taken over by the state in 1998. The Lamsam family, the founder and long-time largest shareholder of Thai Farmers Bank, could not maintain the position. The Development Bank of Singapore became the bank's largest shareholder in 2000.

In 2000, the two families that remain as the largest shareholder of Thai banks were the Sophonpanich and the Rattanarak who own Bangkok Bank and Bank of Ayudhya, respectively. The Crown Property Bureau also managed to have a major stake in Siam Commercial Bank. Nevertheless, to maintain the position as the largest shareholder, a massive funding was raised by selling shares to other investors (most of which were foreign) as well as selling the groups' non-core businesses. For example,

Table 2-1: Ownership of Thai commercial banks in 1996 and 2000

This table presents the name of the founders and the largest shareholders of all Thai commercial banks in 1996 and 2000.

Commercial banks as of 1996	Founding Year	Founders	Largest shareholders		Commercial banks as of 2000
			1996	2000	
Bank of Ayudhya	1945	Panomyong and Luprasert	Ratanarak	Ratanarak	Bank of Ayudhya
Bangkok Bank	1944	Leelanuch and Sophonpanich	Sophonpanich	Sophonpanich	Bangkok Bank
Bangkok Bank of Commerce	1944	Pinitchonkadee and Intaratoot	Tantipipatpong	Closed down in 1998	Krungthai Bank
Bangkok Metropolitan Bank	1950	Euawattanasakul, Srifuengfung, Techapaibul, and Setthapakdee	Techapaibul and Euawattanasakul	State (intervened in 1998)	Bangkok Metropolitan Bank (HSBC)
Bank of Asia	1939	University of Moral Science and Politics	Phatraprasit and Euachukiat	ABN Amro Holding	Bank of Asia
Bank Thai	1998	State	-	State	Bank Thai
First Bangkok City Bank	1955	Tan Keng Kun	Siriwattanapakdee	Closed down in 1998	Krungthai Bank
Krungthai Bank	1966	State	State	State	Krungthai Bank
Laem Thong Bank	1948	Nanthapiwat	Chansrichawala	Closed down in 1998	UOB Radanasin Bank
Nakornthon Bank	1933	Wang Lee	Wang Lee	Standard Chartered Bank	Standard Chartered Nakornthon Bank
Siam Commercial Bank	1906	Crown Property Bureau	Crown Property Bureau	Crown Property Bureau	Siam Commercial Bank

Table 2-1 (continued)

Commercial banks as of 1996	Founding Year	Founders	Largest shareholders		Commercial banks as of 2000
			1996	2000	
Siam City Bank	1941	Nirandorn	Srifuengfung and Panichiwa	State (intervened in 1998)	Siam City Bank
UOB Ratanasin Bank	1998	State	-	United Overseas Bank	UOB Ratanasin Bank
Thai Dhanu Bank	1949	Thaveesin	Tuchinda	DBS Bank	DBS Thai Dhanu Bank
Thai Farmers Bank	1945	Lamsam	Lamsam	Government of Singapore International Corporation	Thai Farmers Bank
Thai Military Bank	1957	Army, Navy, Airforce	Army, Navy, Airforce	Army, Navy, Airforce	Thai Military Bank
Union Bank of Bangkok	1949	Mahakun and Visutthipol	Cholvijarn	Closed down in 1998	Bank Thai

the Rattanrak family sold about 25% of their shares in Siam City Cement to Swiss investors (Hewison (2000)).

As for the political connections of Thai commercial banks before the 1997 economic crisis, Table 2-2 shows that one-third of the banks had some types of political connection. The most common type of connections is the family connection that happens when the largest shareholder of a financial institution is a family whose member or in-law is in cabinet, House of Representative, or Senator. Among 12 family-controlled banks, only five banks had no political connection. There were two state-owned banks and one bank of which the Crown Property Bureau was the largest shareholder, considered as having state connection and the Crown Property Bureau connection, respectively.[4]

After the crisis, in 2000, family-controlled banks had lost their political connection as expected. As discussed above, many of them were closed, sold to foreign investors, or intervened by the government. Overall, out of 11 banks that survived the crisis, six banks had no political connection, four were controlled by the government, and one was controlled by the Crown Property Bureau. Interestingly, there were no longer family-controlled banks with political connections.

2.2 Financial institution failure prediction and economic crises

Most of the studies that attempt to explain the causes of the East Asian economic crisis focus on macro-economic factors (See, for example, Furman and Stiglitz (1998), Radelet and Sachs (1998), Demirg?c-Kunt and Detragiache (1999), Kaminsky and Reinhart (1999)). Although the macroeconomic variables can be used effectively to construct early warning systems for systemic financial distress, they may fail to help analyze if exogenous economic shocks have hit (healthy and troubled) financial institutions hard, or the weaknesses of financial institutions before the crisis have led to the systemic collapse. In other words, the models based on macroeconomic variables do not allow us examine the contribution of firm-level factors to the crises. In addition, studies based on macroeconomic factors may not provide sufficient information to identify which financial institutions are vulnerable to the crises.

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[4] The definition and types of political connections will be thoroughly discussed in Section 3.2.

Table 2-2: Political connection of Thai commercial banks in 1996 and 2000

This table presents the type of political connections of all Thai commercial banks in 1996. "Direct family connection" is when the largest shareholder of a financial institution is a family whose member is in cabinet, House of Representative, or Senator. "Indirect family connection" is when the largest shareholder of a financial institution is a family whose in-law is in cabinet, House of Representative, or Senator. "State connection" is when a financial institution is state owned. "Crown Property Bureau connection" is when the largest shareholder of a financial institution is the Crown Property Bureau.

Commercial banks as of 1996	Largest shareholders		Political connection	
	1996	2000	1996	2000
Bank of Ayudhya	Ratanarak	Ratanarak	No connection	No connection
Bangkok Bank	Sophonpanich	Sophonpanich	Direct family connection	No connection
Bangkok Bank of Commerce	Tantipipatpong	Closed down in 1998	No connection	Closed down in 1998
Bangkok Metropolitan Bank	Techapaibul and Euawattanasakul	State (intervened in 1998)	Direct family connection	State connection
Bank of Asia	Phatraprasit and Euachukiat	ABN Amro Holding	Direct family connection	No connection
First Bangkok City Bank	Siriwattanapakdee	Closed down in 1998	No connection	Closed down in 1998
Krungthai Bank	State	State	State connection	State connection
Laem Thong Bank	Chansrichawala	Closed down in 1998	No connection	Closed down in 1998
Nakornthon Bank	Wang Lee	Standard Chartered Bank	Direct and indirect family connections	No connection
Siam Commercial Bank	Crown Property Bureau	Crown Property Bureau	Crown Property Bureau connection	Crown Property Bureau connection

Table 2-2 (continued)

Commercial banks as of 1996	Largest shareholders		Political connection	
	1996	2000	1996	2000
Siam City Bank	Srifuengfung and Panichiwa	State (intervened in 1998)	Indirect family connection	State connection
Thai Dhanu Bank	Tuchinda	DBS Bank	No connection	No connection
Thai Farmers Bank	Lamsam	Government of Singapore International Corporation	Direct and indirect family connections	No connection
Thai Military Bank	Army, Navy, Airforce	Army, Navy, Airforce	State connection	State connection
Union Bank of Bangkok	Cholvijarn	Closed down in 1998	Direct family connection	Closed down in 1998

To this point, only few studies on the 1997 East Asian crisis have examined individual financial institutions (among others are Laeven (1999) and Bongini, Claessens, and Ferri (2001)). Nevertheless, analyzing micro-level data can be advantageous. For example, it allows us to answer the following question, why some financial institutions could survive despite the fact that they were hit by a similar economic crisis. Moreover, we can compare the characteristics between failed and non-filed financial institutions. This will in turn help to develop systems that can early identify a financial institution which may be at risk of distress or failure in the future.

2.3 The impact of ownership concentration on the likelihood of financial institution failure

We consider two aspects of ownership concentration: the presence of a foreign investor as the largest shareholder and the degree of ownership and control concentration held by the largest shareholder. Note that a family appears to be the most common type of the largest shareholder of Thai non-financial firms (Khanthavit, Polsiri, and Wiwattanakantang (2003)). Since many controlling families of financial institutions also have close political ties, we will discuss the impacts of controlling families on the failure likelihood when we examine the relations between political connection and the financial institution failure.

Having a foreign investor as the largest shareholder should reduce the likelihood of failure during the crisis. Generally, foreign companies possess firm-specific advantages and technology expertise (Boardman, Shapiro, and Vining (1997) and Majumdar (1997)). Most of foreign firms are run by professional managers who hold no stakes in the firms. Also, foreign-owned financial institutions have higher management quality and/or are more diversified. In addition, when depositors' flight to safety occurs during an economic crisis, deposits are likely to shift from domestic to foreign financial institutions. Moreover, foreign financial institutions normally have better access to financing (Bongini, Claessens, and Ferri (2001)). Foreign investors are also proved to be active monitors of the management (Khanna and Palepu (2000a) and Sarkar and Sarkar (2000)).

Regarding the degree of ownership and control concentration, large shareholders with significant fractions of ownership and control stakes are better aligned in terms of interests with other shareholders (Claessens and Fan (2002)).

Consequently, these large shareholders will be less likely to take advantage of corporate resources for their private benefits (Bennedsen and Wolfenzon (2000) and Gomes (2000)). Moreover, large shareholders with higher ownership and control rights have greater incentives to monitor the management, ensuring that firm value maximization is pursued. As a result, the probability of business failure will decrease when the largest shareholder has substantial shares in the firm's votes.

2.4 The impact of political connection on the likelihood of financial institution failure

Political connection plays an important role in economies where law and legal enforcements are weak, the quality of independent institutions to monitor the government is poor, and the level of corruption is high.[5] In this environment, influential business groups may try to obtain political connection so that they can exploit economic resources for their own interests at the expense of the public. Bartels and Brady (2003) argue that business owners enter politics so that they can use their political power to extract private benefits. On the other hand, companies may try to influence politicians through bribes (Shleifer and Vishny (1994)). Morck, Strangeland, and Yeung (2000) show that big business groups have incentives to lobby the government to protect their wealth and business status. Moreover, government contracts and privileges are more easily negotiated among politicians (Boubakri, Cosset, and Saffar (2008)). Accordingly, politically-connected firms should be more advantageous, relative to non-connected firms. Ferguson and Voth (2008) find that firms with political ties outperform the market, while Bunkanwanicha and Wiwattanakantang (2009) show that when big business owners run government offices, the market valuation of the firms increases.

Political connection can benefit firms in several ways. Politically-connected firms might gain easier access to debt financing, and hence have higher leverage ratios than their non-connected counterparts (Johnson and Mitton (2003), Chiu and Joh (2004), Cull and Xu (2005), Khwaja and Mian (2005), Faccio (2006)). Political connection may also allow the firms to borrow from state-owned banks on favorable terms (Khwaja and Mian (2005), Sapienza (2004), Dinc (2005), and Charumilind,

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[5] See for example, Agrawal and Knoeber (2001), Fisman (2001), Johnson and Mitton (2003), Leuz and Oberholzer-Gee (2006), Slinko, Yakovlev, and Zhuravskaya (2005), Faccio (2006), Fisman, Fisman, Galef, and Khurana (20076), Faccio and Parsley (2007), Claessens, Feijen, and Laeven (2008), and Bunkanwanicha and Wiwattanakantang (2009).

Kali, and Wiwattanakantang (2006)). Politically-connected firms benefit from soft budget constraints and tolerate higher default rates than their non-connected peers (Boubakri, Cosset, and Saffar (2008)). Also, the evidence that investors require a lower cost of capital for politically connected firms suggests that they generally consider connected firms to be less risky than non-connected peers (Boubakri, Guedhami, Mishra, and Saffar (2008)). Moreover, political connection increases the chance that firms will be granted license from the government (Mobarak and Purbasari (2006)). Investors generally consider the board nomination of a politically connected director good news as shown by a positive abnormal return in response to such an announcement (Goldman, Rocholl, and So (forthcoming)). When in financial distress, firms with political ties are more likely to be bailed out by the government and are disproportionately more likely to be bailed out when the IMF or World Bank grant financial aid to the government (Faccio, Masulis, and McConnell (2007)). Moreover, troubled banks that provide loans to powerful politicians and their cronies enjoy privileges and receive generous financial supports from state-owned banks (Hutchcroft (1998)).

However, there are a few studies arguing that political ties are possibly detrimental to shareholders and firms. Frye and Shleifer (1997) and Shleifer and Vishny (1998) point out that other than a "helping hand", governments may have a "grabbing hand", which lead them to expropriate shareholders' wealth. Consistent with this view, Cheung, Jing, Rau, and Stouraitis (2005) show that political connection appears to be detrimental to minority shareholders. Minority shareholders of listed firms conducting connected transactions with their controlling state-owned enterprises are exposed to more expropriation than those in firms conducting connected transactions with enterprises that are not controlled by the state. Newly privatized firms that are politically connected show poorer performance than non-connected ones (Fan, Wong, and Zhang (2007) and Boubakri, Cosset, and Saffar (2008)). Firms managed by politically-connected CEOs appear to underperform their non-connected counterparts (Bertrand, Kramaraz, Schoar, and Thesmar (2006)). Moreover, when politicians are involved in management of the firm, it could harm the firm's performance (Fan, Wong, and Zhang (2007)). Shleifer and Vishny (1994) also show that compared with public ownership, private ownership is preferred to politicians because it leads to more efficient resource allocation. Accordingly,

politicians can extract a greater amount of resources from private shareholders through bribes or excess employment.

Overall, political connection can be beneficial or detrimental to the firms and (minority) shareholders. Thus, it is not clear whether political connections increase or decrease the likelihood of business failure. In this study, we extend the literature by examining the effects of political connection on the likelihood that a financial institution will fail during the economic crisis. We consider three types of political connection that reflect the characteristics of Thai financial institutions. They are political connection through controlling families, state connection, and the Crown Property Bureau connection. The impacts of each type of connections on the likelihood of financial institution failure are described as follow.

Controlling family with political connection and the likelihood of financial institution failure

A controlling family can be costly or beneficial to the firm. On the one hand, according to the *expropriation* hypothesis, a controlling family is entrenched due to its significant voting rights and frequent involvement in management, and hence tends to abuse the power in extracting corporate resources for its own interests that do not share with other stakeholders (Shleifer and Vishny (1997), Bebchuk (1999), DeAngelo and DeAngelo (2000), and Johnson, La Porta, Lopez-de-Silanes, and Shleifer (2000)). For example, a controlling family might be tempted to influence, for its own purpose, the financial institution's loan policies. Such the action can lead to a higher degree of prior misallocation of corporate resources and risky lending behavior. As a result, this effect may deteriorate firm performance and increase the probability of financial distress and eventually business failure or bankruptcy. Thus, the presence of a family as the largest shareholder increases the likelihood that the financial institution will fail.

On the other hand, the *monitoring* hypothesis suggests that a controlling family has incentives to monitor and influence the management to undertake only value-enhancing actions (Demsetz and Lehn (1985), Shleifer and Vishny (1986), Admati, Pfleiderer, and Zechner (1994), and Burkart, Gromb, and Panunzi (1997)). Also, since family members provide good monitoring, agency costs tend to be lower in family-controlled firms (Fama and Jensen (1983) and DeAngelo and DeAngelo (1985)). Controlling families normally remain in the firms for a long period, hold

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undiversified portfolios as perceived by substantial ownership stake in the firms, and appoint their members as managers or directors. They thus usually monitor managerial decision-making and influence management to pursue value-maximizing strategies (Demsetz and Lehn (1985)). In addition, if monitoring skills depend on specialized knowledge regarding firm technology, their long-term stay with the firm should make controlling families a good monitor. This is because a controlling family has moved with the firm along its learning curve (Anderson and Reeb (2003)). Furthermore, family members normally have excellent information on the firm because of their long-term relationship with the management (Smith and Amoako-Adu (1999)). Therefore, in this case we should find a negative relation between the presence of a controlling family and the likelihood of business failure.

The influence of a controlling family on the firm and the economy could be greater when it is politically connected. Bongini, Claessens, and Ferri (2001) hypothesize that financial institutions in which an influential family is the largest shareholders will be less likely to be closed due to the family's political connection, unless the resolution procedures are transparent and free from political interference. Similarly, if *monitoring* hypothesis holds, financial institutions in which families are the largest shareholders should be in good shape, and hence less likely to fail during an economic crisis. On the other hand, if *expropriation* hypothesis holds, controlling family financial institutions might be more likely to be in distress, which can lead to a higher probability of failure. Nevertheless, although family-controlled financial institutions are in trouble, their political ties may help them not to be closed. Hence, the influence of controlling families with political connection on the failure likelihood of financial institutions is an empirical issue.

State connection and the likelihood of financial institution failure

Compared with private financial institutions, state-owned financial institutions might not be as efficient. State-owned financial institutions tend to take more risks and are likely to suffer more from political motivated lending (Laeven (1999) and Dinc (2005)). Alternatively, to the extent that during an economy-wide crisis, depositors' flight to safety typically means a flight to state-owned banks, they may be advantageous from depositors' flight to safety. In addition, since they are perceived to be more likely to receive assistance when in trouble, state-owned financial institutions may have better access to financing during the crisis (Ding,

Doma?, and Ferri (1998)). Accordingly, in the case of state-owned financial institutions, distress may be easier to overcome.

Due to the possibly higher degree of prior misallocation of resources and risky lending behaviors, state-connected financial institutions could be more likely to distress. However, with their political support, these financial institutions might be able to avoid closure. This is upon a condition that the closure procedures are not very transparent and could be intervened by political pressures (Bongini, Claessens, and Ferri (2001)).

Crown Property Bureau connection and the likelihood of financial institution failure

The Crown Property Bureau (CPB) was established under the Royal Assets Structuring Act of 1936 to supervise, preserve, and manage the personal wealth of His Majesty the King of Thailand and his immediate family. In 1948, the third amendment of the Royal Assets Structuring Act has elevated the CPB to a juristic person. The King normally takes an active role in the CPB's management. Specifically, the Crown Property Board, which consists of at least four members, will be royally appointed. The board is chaired by the Finance Minister. The King will also select one of the board members, the Director-General who acts as the CPB's Chief Executive Officer (www.crownproperty.or.th). Although the Finance Minister is the Chairman of the Crown Property Board, the CPB is independent of the Thai government. Moreover, even though the CPB is a juristic person, according to Section 8 of the Royal Assets Structuring Act of 1936, the assets of the CPB are eligible for tax exemption (www.wikipedia.com).

Not until the 1970s has the CPB started to invest in corporations as a shareholder (Sricharatchanya (1988)). The CPB holds substantial shareholdings in large listed and non-listed firms in Thailand, e.g. Siam Cement (the largest industrial and petrochemical conglomerates in Thailand), Christiani & Nielsen (one of the largest construction firms), Deves Insurance (one of the largest insurance companies), Siam Commercial Bank (one of the largest commercial banks), and Shin Corporation (the largest telecommunications company, through the CPB's holdings in Siam Commercial Bank). The CPB's investments in companies also include Honda Motor (Thailand), YKK Zipper (Thailand), Nanthawan (Obayashi), Thai Bridgestone, Minebea Electronics (Thailand), Bangkok Aviation Fuel Service, the Dusit Thani Hotel, and the Siam Intercontinental Hotel (www.wikipedia.com). Before the 1997

East Asian crisis, the CPB, the King and his immediate family collectively held a controlling stake in seven listed firms (Polsiri and Wiwattanakantang, 2006). In terms of land and property, the CPB owns approximately 36,000 properties covering around 13,300 acres (54 km?) in Bangkok and 40,000 acres (160 km?) in other provinces. Major properties in Bangkok include the sites of the Four Seasons Hotel, the Suan Lum Night Bazaar, Siam Paragon, and Central World Tower (www.wikipedia.com).

When the crisis hit the Thai economy in 1997, the CPB was shaken. By 1998, the restructuring plan of the CPB involved reducing 143 billion baht worth of new projects and embracing the King's "sufficiency economy" approach. The CPB would concentrate on its core investments in Siam Cement and Siam Commercial Bank and attempt to generate more money from its leases of properties. The CPB also received a considerable amount of post-crisis assistance from the government. For example, the government injected 1 billion US dollars to help Siam Commercial Bank and agreed to sell back its stake to the CPB in the coming years. In 2004, the CPB exchanged a piece of land near Victory Monument with the Ministry of Finance for the shareholdings of 13% in Siam Commercial Bank (Asia Sentinel, 2007).

The CPB, the King of Thailand, and his immediate family are the controlling shareholders of many listed and major private companies. They are considered at least as one of the top ten Thai business groups (Johnstone, Neilsen, and Henderson (2001)). Based on the unique attributes and privileges of the CPB, we conjecture that financial institutions connected with the CPB will be less likely to be closed during the economic crisis.

2.5 The impact of financial factors on the likelihood of financial institution failure

The financial variables commonly used in the literature on banking and financial systems are those related to the CAMEL rating system. Such variables have also applied in the empirical literature on predicting distress and/or failure of financial institutions, and have the expected impacts on the probability of distress/failure.[6] In this study, we develop prediction models based on the following financial variables. As a proxy of "capital adequacy", a higher *ratio of equity to asset* is expected to

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[6] See for example, Sinkey (1975), Meyer and Pifer (1970), Altman (1977), Pettaway and Sinkey (1980), Martin (1997), Bongini, Ferri, and Kang (2000), and Bongini, Claessens, and Ferri (2001).

decrease the likelihood of financial institution failure due to the greater ability to absorb losses. Regarding "asset quality", higher *loan growth* is expected to have a positive effect on the probability of failure since it leads to greater credit risk exposure. We use the *ratio of operating expenses to total revenue* as a financial variable related to the "management quality". It can be expected that the higher the ratio, the greater the likelihood of failure.

In terms of variables regarding "earning ability", a higher *return on assets* is expected to have a negative impact on the probability of failure, while the impact of the *ratio of interest income to total income* is uncertain. The *volatility* hypothesis predicts that on the one hand, a higher ratio of interest income to total income might increase the volatility of income if service income is more stable, increasing the probability with which a financial institution will fail. On the other hand, it might reduce the probability of failure if focusing on the core business entails a better allocation or if service income is actually more volatile in the face of an economic shock (Bongini, Claessens, and Ferri (2001)). Finally, a financial institution with high liquidity risk should be more likely to fail. Hence, the *ratio of total loans to total assets* as a proxy for "liquidity position" is expected to have a positive effect on the probability of failure.

Although it is not considered a CAMEL-type variable, size has frequently been included in early warning and failure/bankruptcy prediction studies as a proxy for "too-big-to-fail" situations. Since large firms tend to have greater impact on a country's economic performance, they might be more likely to receive government support when confronted with financial distress. Such situations are widely known, especially in the case of emerging market economies. Following Bongini, Claessens, and Ferri (2001), we conjecture that larger intermediaries are more inclined to be subject to political intervention and that regulators may consider large financial institutions to be "too-big-to-fail".

Table 2-3 summarizes justification of each explanatory variable and its expected effect on the likelihood that a financial institution fails.

Table 2-3: Explanatory variables and their expected effects on the likelihood that a financial institution fails

Variables	Type of Variables	Expected effect on failure likelihood
Equity to Assets	CAMEL: Capital Adequacy	(-) Ability to absorb losses
Loan Growth	CAMEL: Asset Quality	(+) Credit risk
Operating Expense to Revenue	CAMEL: Management Quality	(+) Inefficiency
Return on Assets	CAMEL: Earnings Ability	(-) Profitability
Interest Income to Total Income	CAMEL: Earnings Ability	(+/-) Less volatility/More volatility of income
Loans to Assets	CAMEL: Liquidity Position	(+) Liquidity risk
Foreign (dummy equal to 1 if the largest shareholder is a foreign investor, and 0 otherwise)	Ownership structure	(+) Management quality and active in monitoring
Control Rights (percentage of votes held by largest shareholder)	Ownership structure	(-) Incentives to monitor
Direct Family Connection (dummy equal to 1 if the largest shareholder's family is in cabinet, House of Representative, or Senator, and 0 otherwise).	Political connection	(-) Political influence
Indirect Family Connection (dummy equal to 1 if the largest shareholder's in-law family is in cabinet, House of Representative, or Senator, and 0 otherwise).	Political connection	(-) Political influence
State Connection (dummy equal to 1 if a financial institution is state owned, and 0 otherwise).	Political connection	(-) Political influence or intervention
Crown Property Bureau Connection (dummy equal to 1 if the largest shareholder is the Crown Property Bureau, and 0 otherwise).	Political connection	(-) Political influence or intervention
Size (measured by log of total assets)	-	(-) Too big to fail

2.6 Failure Prediction Models

In constructing corporate failure prediction models, there are two main strands of research. First, researchers have aimed to identify a set of factors that leads to the lowest rate of misclassification rate. Most of such factors are derived from financial statements. Second, researchers have determined to develop prediction methods that produce the highest prediction accuracy.

Traditionally, models attempting to predict the probability of financial distress and/or corporate failure have employed statistical techniques. Such models have been built on the basic insights of a small number of pioneering papers. One of the pioneering studies is Beaver (1966) who initiates a univariate approach to examine the predictive ability of one financial ratio at a time. A "cut-off" score calculated for each ratio is used as the criterion to separate bankrupt firms from non-bankrupt firms. This is followed by Altman (1968) who introduces Multivariate Discriminant Analysis (MDA) in predicting the likelihood of corporate failure. The discriminant function applies five weighted financial ratios to generate the z-score. The z-score represents the "cut-off" threshold that discriminates between bankrupt and non-bankrupt firms. MDA has prevailed as the most popular method in predicting corporate bankruptcy until the beginning of the 1980s.

Then Ohlson (1980) points out statistical problems regarding MDA and introduces binary logistic regression in classifying bankrupt and non-bankrupt firms. The Ohlson's logistic model combines firms' characteristics into a logistic score that indicates the probability of corporate failure. A firm is classified as failed if its logistic score is below a prior chosen cut-off level.

Statistical techniques used to developed prediction models also include (but not limited to) linear probability model (LPM), probit regression approach, cumulative sums (CUSUM) procedure, and partial adjustment process (Aziz and Dar (2006)). Most of these studies share a similar approach on the basis that a set of statistically best financial accounting data (or ratios) is chosen to differentiate between distressed and non-distressed firms or bankrupt and non-bankrupt firms, within a particular prediction horizon. Despite the development of more advanced statistical techniques, MDA and logistic regression have continued to be most widely used (Altman and Narayanan (1997) and Atiya (2001). The early wave of the literature documented that, to name a few, MDA approaches were used in Altman (1968), Deakin (1972), Blum (1974), and Sinkey (1975), while logistic regression approaches

were used in Martin (1977), Ohlson (1980), and Gentry, Newbold, and Whitford (1985).[7]

Other than traditional statistical approaches, mathematical or computational models have widely been applied in the area of bankruptcy analyses. The most extensively used model is a neural network. However, not until 1990 have neural network approaches been introduced in the field of failure/bankruptcy prediction.[8] Salchenberger, Cinar, and Lash (1992), Coats and Fant (1993), Fernandez and Olmeda (1995), Zhang, Hu, and Patuwo (1999), and Yim and Mitchell (2004) compare between neural network and some traditional statistical approaches. Their experimental results show that neural network approaches significantly outperform the other methods.

Interestingly, Atiya (2001) shows that there is still a gap in the established body of knowledge in this area. As far as we concern, none of previous studies have used ownership structure and political connection variables, in conjunction with financial ratios as the factors in failure prediction models. In this study, we develop logistic regression models using the above mentioned factors.

Early-warning systems

Financial institution failure prediction models that can be used in developing "early warning systems" have been introduced since the 1970s. The first generation of the systems sought to construct screening tools to help in scheduling individual on-site bank examinations by identifying as early as possible those banks in (or impending) distress. These studies share a similar method and largely applied to banking systems in developed economies (Meyer and Pifer (1970), Sinkey (1975), Altman (1977), Martin (1977), and Pettaway and Sinkey (1980)). Based on a set of financial ratios, representing different aspects of the CAMEL rating system, the statistically best subset of ratios is selected to separate between financially distressed and sound financial institutions. Since these models are designed to early predict the economic insolvency of a bank, their goal is to identify situations in which a bank might not be able to service its contractual liabilities using its own resources. These situations are not necessarily followed by an official announcement of insolvency (and subsequent closure) by the supervisory agency.

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[7] Altman (1981) provides a comprehensive survey.
[8] See Atiya (2001) for a review of neural network application to the bankruptcy prediction, and comparison between statistical and neural network approaches in bankruptcy prediction models.

From a viewpoint of authorities regulating and supervising financial institutions, sound early warning systems can help reduce the use of relatively limited examination resources while still attaining as effective failure prevention as possible. Certainly, failure prediction models and early warning systems have proven essential devices for supervisory agencies to closely monitor financial institutions and instigate corrective actions.

Empirical papers on predicting financial institution failures normally involve two steps. First, sample financial institutions are categorized as failed versus non-failed. Then, financial ratios calculated based on accounting data and/or market information are identified, as the ex-post determinants of the event, using statistical tools to develop failure prediction models. Techniques include MDA, logistic or probit regression models, two-step logistic regression procedures and, more recently, proportional hazard models, where both the probability of failure-event occurring and the timing of that event are estimated (Lane, Looney, and Wansley (1986), Whalen (1991), Cole and Gunther (1995), and Gonzales-Hermosillo (1999)).

Chapter 3

Data and Methodology

This chapter begins with the discussion of our sample. Then, the explanatory variables, i.e., ownership concentration, political connection, and financial variables, as well as the data sources are illustrated. Finally, the chapter reviews the approach used to develop our failure prediction models, namely a logistic regression. These models are also used to investigate the effects of ownership concentration, political connection, and financial factors on the probability with which financial institutions fail.

3.1 The sample

Our sample includes all banks and finance companies in Thailand during the East Asian economic crisis period 1992-1998. In total, there are 15 banks and 88 finance companies in the sample; 60 of which were closed or merged into other institutions in either 1997 or 1998. Among those financial institutions that failed, four were banks and the rest were finance companies. Due to the measures taken by the Bank of Thailand in order to restore the stability of financial and banking systems in response to the crisis, financially distressed finance companies were ordered to close or merge in 1997, while for the banks the incidence occurred in 1998. The list of publicly traded banks and finance companies that were ordered to close or merge into other institutions is provided on the websites of the Bank of Thailand and the Stock Exchange of Thailand.

3.2 The variables

Legislation background on bank and finance company ownership

Banks and finance companies operate under legal and regulatory environments which are substantially different from those of non-financial firms. This section describes briefly the regulations that are related to the limitation on shareholdings of Thai financial institutions.

Commercial banks are governed by the Commercial Baking Act B.E. 2505 (A.D. 1962) while finance companies are governed by the Act on the Undertaking of Finance Business, Securities Business and Credit Foncier Business, B.E. 2522 (A.D. 1979). By law, a person is allowed to hold at most 5% of the total amount of a commercial bank's shares sold and 10% of the total amount of a finance company's shares sold. A person includes his or her spouse and minor child, as well as a company where the person and/or his or her spouse and minor child hold, separately or aggregately, more than 30% of the company's shares. However, it does not apply to other members of the same family or related families. In addition, the law does not limit ownership by government agencies, state enterprises, and juristic persons established under a specific law such as the FIDF.

Until the crisis, the law imposed foreign ownership ceiling at 25% of a financial institution's total shares and foreign board participation at less than one-fourth of a financial institution's total number of directors. Nevertheless, after the 1997 financial crisis, foreign investors are allowed to hold more than 25%. The Thai government has relaxed existing restrictions on the foreign ownership in financial institutions by permitting foreign investors to hold 100% of banks' shares, subject to certain conditions. More precisely, foreign investors are allowed to acquire a majority ownership stake in a locally-incorporated financial institution for a 10-year period. Subsequent to that period, although foreign investors will not be forced to sell their shares, additional shares may not be acquired unless the ownership stake is below 49% of the financial institution's total shares.

The definition of largest shareholders

We view that the definition of shareholders according to the law described above is too narrow for at least two reasons. First, it is a common practice in Thailand as in many emerging economies that firms are owned by a group of people from the same family or families that are connected by marriage. Family members in Thailand often do business together and vote as a coalition. Second, a person does not need to hold 30% of a firm's shares to be able to gain control. Holding at least 25%, a shareholder has a control power over a firm (Wiwattanakantang (2001) and Khanthavit, Polsiri, and Wiwattanakantang (2003)). The Public Limited Companies

Act B.E. 2535 (A.D. 1992) implies that there will be no other single shareholder that would have enough voting rights of at least 75% to have absolute power over the firm.

Therefore, we employ a broader definition of a shareholder defined as follows. A shareholder here includes: 1) his or her spouse, children, siblings, relatives, and in-laws, and 2) companies that are owned by him or her for more than 25%.

The definition of political connection

The definition of political connection is as followed. Based on Faccio, Masulis, and McConnell (2007) with some adjustments according to the characteristics of our data, we separate the political connection into four categories: no political connection, family political connection, the state connection, and the Crown Property Bureau connection. As for family political connection, we define a family-politically connected firm as a firm in which a family member of at least one of its top management (i.e., the firm's chief executive officer (CEO), chairman of the board, president, vice-president, general manager, managing director, or executive board member) or a family member of its largest shareholder (with a minimum control rights of 10%) was the prime minister, a minister, a senator, or a member of the House of Representatives as of one year prior to failure. This is considered as a direct political connection. As for an indirect connection, a firm is family-politically connected through an indirect connection when a member of its top management's in-law family or largest shareholder's in-law family was the prime minister, a minister, a senator, or a member of the House of Representatives as of one year prior to failure.

We also consider the state connection and the Crown Property Bureau connection. A financial institution is connected with the state if the state is its largest shareholder. Similarly, a financial institution is connected with the Crown Property Bureau if the Crown Property Bureau holds the largest shareholding.

Explanatory variables: Financial, ownership concentration and political connection

Unlike most of previous studies of which failure prediction models are based largely on financial variables, we develop prediction models using three types of variables: traditional financial variables and our main focus, ownership concentration and political connection variables. The financial variables most extensively used in the existing literature are based on the CAMEL-type of analysis (see for example,

Meyer and Pifer (1970), Sinkey (1975), Altman (1977), Pettaway and Sinkey (1980), Martin (1997), Bongini, Ferri, and Kang (2000), and Bongini, Claessens, and Ferri (2001)). Due to the availability of our data, in this paper the financial variables include *Equity to Assets, Loan Growth, Operating Expenses to Revenue, Return on Assets*, *Interest Income to Total Income,* and *Loan to Assets*.

Our ownership concentration variables include *Foreign*, which is a dummy indicating if a foreign investor is the largest shareholder of a financial institution; and *Control Rights*, which is the percentage of votes held by the largest shareholder of a financial institution. The political connection variables include 1) *Direct Family Connection*, which is a dummy equal to 1 if a member of the top management's family or the largest shareholder's family is politically connected, and zero otherwise, 2) *Indirect Family Connection*, which is a dummy equal to 1 if a member of the top management's in-law family or the largest shareholder's in-law family is politically connected, and zero otherwise, 3) *State Connection*, which is a dummy equal to 1 if the state is the largest shareholder of a financial institution, and zero otherwise, and 4) *Crown Property Bureau Connection*, which is a dummy equal to 1 if the Crown Property Bureau is the largest shareholder of a financial institution, and zero otherwise. Finally, the explanatory variables also include *Size*, which is measured by the log of total assets. The effects of these factors on the probability with which a financial institution will fail are already described in Chapter 2.

Data sources

This study aims to develop sound failure prediction models for financial institutions that incorporate ownership structure, political connection, and financial variables. Accordingly, the relevant data include financial, ownership, board of directors, top management, and political connection data. The SETSMART database (produced by the Stock Exchange of Thailand) and the Finance Companies Handbooks (produced by the Association of Finance Companies) are the main sources of financial and ownership data used in this study. Regarding financial data, these databases provide information on financial statements. As for ownership data, the databases provide the list of a financial institution's major shareholders. Additional information on the family relationships among major shareholders is collected from

the document FM 56-1.[9] Moreover, shareholders' family relationships via marriages are identified using various sources both in English and in Thai, namely Phipatseritham (1981), Phipatseritham and Yoshihara (1983), Suehiro (1989), Sappaiboon (2000a, 2000b, and 2001), and Johnstone, Neilsen, and Henderson (2001).

In addition, to trace the ultimate ownership of private companies who appear as corporate shareholders of our sample firms, the BOL database (produced by the Business OnLine Public Company Limited) and company profiles submitted to the Ministry of Commerce are employed.[10] Regarding the data on political connection, we use the on-line database, called "My First Info" produced by Thaidatabase & Information, Co. Ltd. The politics category of this database provides the lists of ministers, senators, and members of the House of Representatives of all periods.

3.3 Methodology

This study is to examine whether concentrated ownership structure and political connection help explain the likelihood of financial institution failure during the East Asian crisis. To do so, we will first conduct univariate tests to compare ownership structure, political connection, and financial characteristics between failed and non-failed financial institutions using univariate tests. Then we will apply a logistic regression, which is one of the most widely-used methods, to develop failure classification models (Altman (1968), Altman and Narayanan (1997), and Atiya (2001)) and to investigate the effects of ownership structure and political connection on the likelihood of financial institution failure.

Univariate tests

To examine the relations between ownership structure, political connection as well as financial characteristics, and the failure likelihood, one way is to conduct a univariate analysis. This approach involves a comparison of firm characteristics between two subsamples. One subsample contains failed financial institutions while the other includes non-failed financial institutions.

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[9] All listed companies are required to submit FM 56-1 to the Stock Exchange annually. It is available at the library and the website of the Stock Exchange of Thailand.
[10] Basically, the BOL databank includes ownership and financial data of all registered companies in Thailand. The Business OnLine Ltd. has the license from the Ministry of Commerce to reproduce this information.

The univariate specification provides preliminary investigation of the relation between individual characteristics of financial institutions and failure likelihood. However, it fails to incorporate all significant factors determining the likelihood that financial institutions fail. Alternative approaches not only investigate the effects of concentrated ownership structure, political connection, and financial factors on the probability of failure but also incorporate all significant determinants of the failure likelihood. A well-documented approach is a logistic regression described in the following section.

Logistic regression model

A logistic regression model is estimated using the maximum likelihood method. The logistic prediction model used in this study is as follows.

$$\text{Prob} (Y_i = 1) = \frac{1}{1 + \exp(-Z_i)} \qquad (1)$$

where

$$Z_i = \alpha + \sum \beta_j X_{j,i} + \varepsilon_i \qquad (2)$$

Y_i is the dependent categorical variable assigned the value of 1 if a financial institution i is order to close or merge into other institution, and zero otherwise; Z_i is a linear function in which α is the estimated intercept, β_j is the coefficient of X_j; $X_{j,i}$ is the explanatory variable j for the ith financial institution; and ε_i is the unknown parameter j. Prob $(Y_i = 1)$ is the probability with which financial institution i will fail. If the computed probability exceeds 0.5, the financial institution is classified as failed.

A logistic regression is not susceptible to the restrictive assumptions on which MDA relies. That is, no assumptions of the normality of predictor distributions or the prior probabilities of corporate failure are imposed. In addition, using a logistic regression model, one can identify the likelihood of corporate failure for each firm. Moreover, the coefficients of explanatory variables in a logistic regression model indicate whether such predictors are statistically significant in determining the failure likelihood (Ohlson (1980)). Another advantage of a logistic regression model is the degree of non-linearity due to its logistic function (Laitinen and Kankaanpaa (1999)). Nevertheless, some limitations of a logistic regression model exist. First, it is subject to the multicollinearity problem. Second, it assumes a logistic probability distribution. Third, it is sensitive to outliers and missing values (Balcaen and Ooghe (2004)).

Chapter 4
Empirical Analysis

In this chapter, we discuss the results of our empirical investigation. We first present the major characteristics that concern ownership concentration, political connection, and financial attributes of our sample financial institutions. We also separate the sample financial institutions into failed and non-failed financial institutions, and compare the ownership structure, political connection, and financial characteristics between two subsamples using univariate tests. Then, we examine whether such characteristics affect the likelihood of financial institution failure and develop failure prediction models using a logistic regression. Unlike most of previous prediction models, our models consist of ownership structure, political connection, and financial variables.

4.1 Univariate tests: Financial, ownership structure, and political connection characteristics of non-failed versus failed financial institutions

The descriptive statistics of the explanatory variables for all financial institutions in our sample are presented in Table 4-1. The table also shows the mean tests for differences in financial, ownership and political connection characteristics between non-failed and failed financial institutions. To preliminarily investigate whether our models are robust over time to failure, we also divide the data into five periods, one year (denoted by t-1), two years (denoted by t-2), three years (denoted by t-3), four years (denoted by t-4), and five years (denoted by t-5) prior to failure.

As regards financial variables, the all-years data indicate that only two (out of six) financial factors are different between failed and non-failed groups. More precisely, overall failed financial institutions have a higher growth of loans, which is consistent with the notion of greater credit risks in failed financial institutions. This finding also holds for every year prior to failure. In addition, failed institutions have lower ratios of interest income to total income. The result indicates that income of failed firms is more volatile. Nevertheless, the ratio of interest income to total income is not significantly different between the two groups when we consider one, two, and three years before failure. Surprisingly, failed financial institutions are not different from non-failed ones in terms of performance, although the t-1 data show that non-

Table 4-1: Financial, ownership, and political connection characteristics of non-failed financial institutions, and failed financial institutions.

The sample consists of financial institutions operating between 1991 and 1998. "Failed FIs" are financial institutions that were ordered to close or merge into other institutions during the East Asian economic crisis. "*All-years*" represents the data of one to five years prior to the failure. "*t*-1" represents the data of one year prior to the failure. "*t*-2" represents the data of two years prior to the failure. "*t*-3" represents the data of three years prior to the failure. "*t*-4" represents the data of four years prior to the failure. "*t*-5" represents the data of five years prior to the failure. "Family" is a dummy equal to 1 if a family is the largest shareholder of a financial institution, and zero otherwise. "Foreign" is a dummy equal to 1 if a foreign investor is the largest shareholder, and zero otherwise. "Control Rights" are the percentage of votes held by the largest shareholder. "Direct Family Political Connection" is a dummy equal to 1 if a family member of at least one of the top management or of the largest shareholder is the prime minister, a minister, a senator, or a member of the House of Representatives, and zero otherwise. "Indirect Family Political Connection" is a dummy equal to 1 if an in-law family member of at least one of the top management or of the largest shareholder is the prime minister, a minister, a senator, or a member of the House of Representatives, and zero otherwise. "State Connection" is a dummy equal to 1 if the state is the largest shareholder, and zero otherwise. "Crown Property Bureau Connection" is a dummy equal to 1 if the Crown Property Bureau is the largest shareholder, and zero otherwise.

Characteristics	*All-years*		*t-1*		*t-2*		*t-3*		*t-4*		*t-5*	
	Non-failed FIs	Failed FIs	Non-failed FIs	Failed FIs	Non-failed FIs	Failed FIs	Non-failed FIs	Failed FIs	Non-failed FIs	Failed FIs	Non-failed FIs	Failed FIs
Financial characteristics												
Equity to Assets	0.103	0.100	0.083	0.078	0.110	0.100	0.114	0.108	0.107	0.103	0.098	0.104
Loan Growth (%)	22.77	39.53[a]	6.57	13.70[c]	18.93	34.88[a]	26.42	45.38[a]	26.91	46.05[a]	26.94	48.03[a]
Operating Expense to Revenue	0.181	0.178	0.166	0.150[c]	0.169	0.161	0.189	0.186	0.193	0.192	0.181	0.192
Return on Assets (%)	1.21	1.19	-1.28	-1.23	1.33	0.48[a]	1.58	1.43	1.87	2.50	1.93	2.10
Interest Income to Total Income	0.868	0.841[b]	0.964	0.972	0.898	0.908	0.857	0.831	0.824	0.762[a]	0.822	0.764[b]
Loans to Assets	0.794	0.803	0.815	0.837[b]	0.814	0.810	0.795	0.805	0.780	0.781	0.779	0.791

Table 4-1 (continued)

Characteristics	All-years		t-1		t-2		t-3		t-4		t-5	
	Non-failed FIs	Failed FIs	Non-failed FIs	Failed FIs	Non-failed FIs	Failed FIs	Non-failed FIs	Failed FIs	Non-failed FIs	Failed FIs	Non-failed FIs	Failed FIs
Ownership characteristics												
Family	0.563	0.810[a]	0.543	0.758[b]	0.585	0.825[a]	0.571	0.804[a]	0.548	0.820[a]	0.567	0.816[a]
Foreign	0.175	0.045[a]	0.130	0.030[c]	0.151	0.035[b]	0.190	0.054[b]	0.194	0.040[a]	0.183	0.061[b]
Control Rights (%)	34.40	33.18	32.41	28.31	33.73	32.64	35.70	33.48	35.37	36.61	33.71	33.10
Political connection												
Direct Family Political Connection	0.455	0.405	0.565	0.424	0.547	0.386[c]	0.429	0.375	0.403	0.360	0.383	0.490
Indirect Family Political Connection	0.276	0.387[a]	0.261	0.424	0.321	0.316	0.302	0.393	0.258	0.440[b]	0.250	0.367
State Connection	0.101	0.117	0.130	0.182	0.113	0.088	0.095	0.125	0.097	0.120	0.083	0.102
Crown Property Bureau Connection	0.164	0.020[a]	0.174	0.030[b]	0.170	0.018[a]	0.159	0.018[b]	0.161	0.020[a]	0.167	0.020[a]
Size												
Total Assets (mil. baht)	141,832.0	25,248.5[a]	234,165.1	43,598.9[a]	177,090.1	28,988.7[a]	128,545.7	24,272.7[a]	108,543.2	19,694.2[a]	92,729.6	15,438.6[a]
No. of observations	286	247	46	34	53	57	63	56	62	50	60	49

[a] denotes statistically significant difference in means at the 1% level.
[b] denotes statistically significant difference in means at the 5% level.
[c] denotes statistically significant difference in means at the 10% level.

failed companies have higher returns on assets. Finally, higher ratios of loans to assets in the *t*-1 model suggest that failed financial institutions have higher liquidity risk.

Relating to ownership variables, all-years data of Table 4-1 shows that in almost 80% of failed financial institutions, a family is the largest shareholder, while the percentage is significantly lower at around 56% for non-failed ones. This result also holds for other sample periods, and suggests that financial institutions whose largest shareholder is a family are significantly more likely to fail. In contrast, the presence of foreign investors as the largest shareholder appears to reduce the failure likelihood. Specifically, foreign investors are the largest shareholders in only about 5% of failed financial institutions. Such a proportion increases to almost 18% in non-failed financial institutions. This result is robust across time to failure.

Considering control rights held by a financial institution's largest shareholder, although no shareholder was allowed to hold more than 5% of a bank's outstanding shares and 10% of a finance company's outstanding shares, largest shareholders of Thai financial institutions could somehow manage to go beyond the limitation.[11] Overall, the largest shareholder of a failed and non-failed financial institution holds, on average, 33% and 34% of the control rights, respectively. Failed financial institutions seem to have lower fractions of votes held by the largest shareholder than their non-failed counterparts. However, while the identity of the largest shareholder appears to be significantly different between failed and non-failed institutions across time to failure, control rights held by the largest shareholder is insignificantly different between two subsamples. This result does not support the view that when largest shareholders hold higher control rights, they have more incentives to monitor managerial actions.

As for political connection factors, the outstanding findings concern the connection with the Crown Property Bureau. More precisely, all-years data in Table 4-1 show that the percentage of failure is significantly lower among financial institutions connected with the Crown Property Bureau (i.e., 2% versus 16%). This result holds for all periods. In contrast with the presence of families as the largest shareholders, direct family political connections in failed and non-failed financial institutions are not significantly different although a lower fraction of failed financial institutions have such connection, except in five years prior to closure. That is, in all

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[11] See Anuchitworawong, Souma, and Wiwattanakantang (2003) and Polsiri and Wiwattanakantang (2006) for the detailed discussion about ownership characteristics Thai banks.

firms-years, about 41% and 46% of failed and non-failed financial institutions, respectively, are directly politically connected. The results, however, vary among sample periods. On the other hand, the percentage of indirect family political connections seems to be different between the two subsamples. Considering all-year data, approximately 39% of failed firms have such connection, whereas around 28% of non-failed firms are indirectly politically connected. The similar patterns are found across time to failure but only the results of the t-1, t-4, and t-5data are significant. Finally, all-year data suggest that about 12% of failed and 10% of non-failed financial institutions are connected with the state. Nevertheless, while the proportion of failed state-owned financial institutions is lower than non-failed ones, there is no significant difference between both groups.

With regard to the size of failed and non-failed financial companies, our univariate tests show that failed financial intermediaries are significantly smaller than non-failed intermediaries. This finding is highly significant and robust throughout the sample periods. The result suggests that larger institutions are less likely to fail. Hence, the view of a "too-big-to-fail" policy is supported.

The univariate specifications discussed previously have one main limitation. That is, they fail to control for other variables that also have a significant impact on the likelihood that a financial institution fails. To control for the effects of other significant variables as well as to develop failure prediction models using ownership concentration, political connection, and financial variables, in the next section, we apply a logistic regression. A logistic regression is widely recognized in the existing literature.

4.2 Results of logistic models

As noted before, the variables used in this paper consist of ownership structure, political connection, and financial variables. The ownership structure variables include *Foreign*, and *Control Rights*, while the political connection variables include *Direct Family Connection, Indirect Family Connection, State Connection*, and *Crown Property Connection*. The financial or CAMEL-type variables include *Equity to Assets, Loan Growth, Operating Expenses to Revenue, Return on Assets, Interest Income to Total Income,* and *Loan to Assets*. *Size* is also incorporated to examine the "too-big-to-fail" policy in the closure of Thai financial intermediaries during the economic crisis.

The results of our logistic models are presented in Table 4-2. Overall, the models produce good prediction accuracy. Specifically, 86.25%, 87.27%, 84.87%, 80.36%, and 79.82% of financial institutions are correctly classified in the models that use the data of one year (the t-1 model), two years (the t-2 model), three years (the t-3 model), four years (the t-4 model), and five years (the t-5 model), prior to the failure, respectively. Like previous studies (e.g., Atiya (2001) and Dewaelheyns and Van Hulle (2004)), the predictive power tends to decline over time to failure. However, this shows that our models appear to be robust, regardless of time to failure.

Considering Type I error (the misclassification of failed financial institutions as non-failed) and Type II error (the misclassification of non-failed financial institutions as failed), we find that Type I error is 14.70% while Type II error is 13.04% for the t-1 model. Our model also appears to perform relatively well compared with a similar study by Bongini, Claessens, and Ferri (2001).[12] Consistent with the results of the overall predictive power, the Type I and Type II errors tend to increase over time to closure. Like Bongini, Claessens, and Ferri (2001), our Type I errors are higher than the Type II errors.

Consistent with the results of our univariate tests, the results of the logistic models also suggest that traditional financial variables appear to perform well in predicting financial institution failure in all-years model. All financial predictors show significant results at the 1% level. The effects of most of the variables on the failure likelihood are as expected. The only exception is the proxy for "Management Quality" the CAMEL-type variables. Specifically, the ratio of equity to assets has a negative and significant impact, implying the ability to absorb losses. Nonetheless, this finding is not statistically significant when we separate the data into different time to failure. Loan growth significantly and positively affects the probability with which a financial institution fails. Hence, it supports the notion that higher credit risk increases the failure likelihood of intermediaries. The result also holds for all but the t-1models.

In contrast with our conjecture, the ratio of operating expense to revenue is negatively related to the incidence of financial institution failure. Rather surprisingly, this evidence is not consistent with the notion that a lower operating expense to

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[12] Specifically, their prediction model for closure has overall predictive power of 86.98% with Type I and Type II errors of 34.21% and 8.47%, respectively. Their prediction model for conditional closure has overall predictive power of 81.73% with Type I and Type II errors of 15.79% and 19.70%, respectively.

Table 4-2: Logistic Regression Models: The coefficients of explanatory variables on the likelihood of financial institution failure.

The sample consists of financial institutions operating between 1991 and 1998. The dependent variable is the incidence that a financial institution was ordered to close or merge into other institutions during the East Asian economic crisis. The "*All years*" model uses the explanatory variables of one to five years prior to the failure. The "*t*-1" model uses the explanatory variables of one year prior to the failure. The "*t*-2" model uses the explanatory variables of two years prior to the failure. The "*t*-3" model uses the explanatory variables of three years prior to the failure. The "*t*-4" model uses the explanatory variables of four years prior to the failure. The "*t*-5" model uses the explanatory variables of five years prior to the failure. Numbers in parentheses are *t*-statistics. "Foreign" is a dummy equal to 1 if a foreign investor is the largest shareholder of a financial institution, and zero otherwise. "Control Rights" are the percentage of votes held by the largest shareholder. "Direct Family Political Connection" is a dummy equal to 1 if a family member of at least one of the top management or of the largest shareholder is the prime minister, a minister, a senator, or a member of the House of Representatives, and zero otherwise. "Indirect Family Political Connection" is a dummy equal to 1 if an in-law family member of at least one of the top management or of the largest shareholder is the prime minister, a minister, a senator, or a member of the House of Representatives, and zero otherwise. "State Connection" is a dummy equal to 1 if the state is the largest shareholder, and zero otherwise. "Crown Property Bureau Connection" is a dummy equal to 1 if the Crown Property Bureau is the largest shareholder, and zero otherwise. Numbers in parentheses are *z*-statistics.

Explanatory variables	All-years	t-1	t-2	t-3	t-4	t-5
Intercept	11.56[a] (5.68)	29.13[a] (2.15)	22.37[a] (2.72)	19.30[a] (3.30)	12.77[a] (2.76)	10.47[b] (2.37)
Financial variables						
Equity to Assets	-8.31[a] (-2.70)	-17.53 (-1.28)	-9.83 (-1.11)	-10.09 (-1.33)	-13.07[c] (-1.73)	-7.84 (-1.05)
Loan Growth	1.56[a] (3.66)	4.17 (1.49)	4.12[b] (2.16)	2.67[a] (2.48)	1.80[b] (1.95)	2.09[b] (2.31)
Operating Expense to Revenue	-9.18[a] (-3.97)	-2.89 (-0.34)	-17.62[b] (-2.39)	-14.54[b] (-2.33)	-10.93[b] (-2.02)	-5.61 (-1.08)
Return on Assets	-10.98[a] (-2.27)	-7.19 (-0.46)	-99.17[b] (-1.95)	-45.06 (-0.97)	4.12 (0.31)	-13.69 (-1.46)
Interest Income to Total Income	-3.91[a] (-3.23)	-3.66 (-1.13)	-8.20[a] (-1.48)	-9.49[b] (-2.29)	-5.29[b] (-2.05)	-6.22[a] (-2.46)
Loans to Assets	4.04[a] (2.53)	0.75 (0.08)	-2.63 (-0.46)	2.85 (0.91)	4.11 (1.21)	5.55[c] (1.70)

Table 4-2 (continued)

Explanatory variables	*All-years*	*t-1*	*t-2*	*t-3*	*t-4*	*t-5*
Ownership variables						
Foreign	-2.53[a] (-5.99)	-4.95[a] (-2.47)	-2.72[b] (-2.21)	-2.39[a] (-2.66)	-2.51[a] (-2.71)	-2.16[b] (-2.30)
Control Rights	-0.04[a] (-5.24)	-0.10[a] (-2.62)	-0.04[c] -1.89	-0.05[a] (-2.75)	-0.03[c] (-1.89)	-0.05[a] (-2.54)
Political connection						
Direct family political connection	-0.10 (-0.44)	-1.38 (-1.58)	-0.84 (-1.43)	0.15 (0.27)	-0.19 (-0.33)	0.91[c] (1.67)
Indirect family political connection	0.21 (0.86)	0.51 (0.55)	-0.45 (-0.78)	0.41 (0.76)	0.73 (1.20)	0.17 (0.29)
State connection	0.73[c] (1.73)	3.42[c] (1.76)	-0.33 (-0.32)	0.92 (1.02)	0.96 (0.88)	0.60 (0.57)
Crown Property Bureau connection	-2.74[a] (-4.90)	-3.30[b] (-2.23)	-2.85[b] (-2.30)	-2.47[b] (-1.98)	-2.87[b] (-2.22)	-2.74[b] (-2.25)
Size						
Log (Total Assets)	-0.78[a] (-7.77)	-1.99[a] (-3.21)	-0.64[b] (-2.18)	-0.84[a] (-3.27)	-0.83[a] (-3.47)	-0.77[a] (-3.52)
No. of observations	530	80	110	119	112	109
χ^2	213.49	47.33	62.17	55.36	52.67	49.87
Prob > χ^2	0.00	0.00	0.00	0.00	0.00	0.00
Pseudo R^2	0.29	0.44	0.41	0.34	0.34	0.33
Overall prediction accuracy		86.25%	87.27%	84.87%	80.36%	79.82%
Type I error[d]		14.70%	15.79%	16.07%	28.00%	24.49%
Type II error[e]		13.04%	9.43%	14.29%	12.90%	16.67%

[a] denotes statistical significance at the 1% level.

[b] denotes statistical significance at the 5% level.

[c] denotes statistical significance at the 10% level.

[d] is the misclassification of failed financial institutions as non-failed.

[e] is the misclassification of non-failed financial institutions as failed.

revenue ratio implies effective management, and thus the lower ratio should suggest a lower failure probability. The result is also found in the t-2, t-3, and t-4 models. Only the operating expense to revenue ratio might not capture all management quality. Some ownership structure and political connection factors could have influences on the firm's management quality as well.

As expected, financial institutions with higher returns on assets are less likely to fail. However, only the all-years and t-2 models show significant results. The ratio of interest income to total income has a negative impact on the likelihood that a financial institution fails. That is, the likelihood of failure is lower when a share of interest income in total income is larger.[13] This finding is robust for all but the t-1 and t-2 models. The significant impact of the ratio of interest income to total income confirms the *volatility* hypothesis that income of failed firms is more volatile. Last but not least, the all-years model exhibits that failed financial institutions have higher ratios of loans to assets. This evidence supports the view that failed financial institutions have higher liquidity risk. Nonetheless, such evidence is not found in other models.

Confirming what we find from the univariate tests, ownership concentration factors appear to have a significant impact on the probability of business failure as shown by the following results. Considering the identity of a largest shareholder, financial institutions of which foreign investors are the largest shareholder are less likely to fail. The result holds for all models, suggesting the *monitoring effects* of controlling shareholders and *management quality* of foreign financial institutions. Regarding control rights held by the largest shareholder, a high degree of ownership concentration decreases the likelihood of failure. This finding is robust across times to failure, indicating that when the largest shareholder of a financial institution holds substantial voting rights, he or she has *greater incentives* and more power to *monitor* the management to pursue value-enhancing actions. Accordingly, the likelihood of financial institution failure is reduced.

As for political connection factors, Table 4-2 exhibits that the connection through controlling families appears to play no important role in determining the

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[13] This finding is consistent with Bongini, Claessens, and Ferri (2001).

failure likelihood.[14] Although the univariate tests show significant differences between firms indirectly politically connected through families, such significances disappear when we incorporate other factors in the models. The logistic results indicate that controlling families with political connection do not affect whether their financial institutions will be closed or not. This evidence is somehow consistent with Bongini, Claessens, and Ferri (2001) who argue that financial institutions connected with influential families are more likely to be closed, suggesting that the financial institution closure process is relatively free from political pressures.[15] Note that in unreported univariate tests, we find that firms that have political connection through controlling families show no differences in performance, as measured by the return on assets, from firms without such connection.

On the other hand, connection with the Crown Property Bureau reduces the likelihood that the firm will be closed. This result is highly robust and can be interpreted in two ways. First, financial institutions controlled by the Crown Property Bureau more effectively perform when compared with others. Second, the political power of the Crown Property Bureau may influence the closure process. In the univariate tests not reported here, we find that financial institutions with and without connection with the Crown Property Bureau have insignificant performance during the sample periods. Therefore, our findings seem to support the latter interpretation.

Interestingly, state-owned financial institutions are more likely to fail, although only the all-years and t-1 models show significant results. This might be the case that financial companies connected with the state perform poorly and/or more risky, relative to non-connected ones. Alternatively, it is also possible that the closure process is not subject to the government political power. Again, we run univariate tests, which are not presented in the paper, to compare performance between state-connected and non-connected financial institutions. Considering each of our models, there are no significant differences in performance between the two groups. About the risk taking, we only find that the state-connected financial companies have higher loan growth and loan to assets ratios in two and one years prior to the failure,

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[14] In Bongini, Ferri, and Kang (2000) and Bongini, Claessens, and Ferri (2001), a connection with influential families increases the probability of corporate distress due to the financial institution's likely higher degree of misallocation.

[15] However, their definition of connection with influential families is different from our definition of political connection through controlling families.

respectively. Accordingly, we may conclude here that the closure process is not intervened by the government to protect their affiliations.

Examining a "too-big-to-fail" policy, we find that larger financial institutions are less likely to fail. Nevertheless, this result might be due to the fact that larger financial institutions have performed better than smaller ones. We hence investigate whether it is the case. The univariate tests not reported here shows that using the all-years data, larger financial institutions (i.e., financial institutions with total assets greater than the median) actually have lower return on assets (significant at the 1% level). However, when we divide the data into five periods before failure, this result does not hold. Specifically, the tests show insignificant differences in the performance between large and small financial institutions. Taken altogether, these findings imply that a "too-big-to-fail" policy may exist in the closure decision of Thai financial institutions.

Chapter 5

Conclusions and Suggestions for Future Research

To this point, our study has investigated ownership structure, political connection, and financial characteristics of financial institutions that are closed during the 1997 East Asian crisis period, and compared the characteristics between failed and non-failed financial institutions. The study has also examined how concentrated ownership structure and political connection factors affect the likelihood of financial distress, and developed logistic prediction models that incorporate such factors as well as financial variables. In this final chapter, we review the results of the empirical tests, especially the impacts of ownership concentration, political connection, and financial factors on the failure likelihood, as well as the prediction accuracy of our logistic prediction models. In addition, we provide some suggestions for future research in the areas of corporate governance as well as corporate distress/failure prediction.

5.1 Conclusions

In this study, we develop logistic models to predict failure of financial institutions and investigate the effects of concentrated ownership structure and political connection. Our focus is banks and finance companies in an emerging economy with weak legal and regulatory systems. As further contribution to the literature on the effects of concentrated ownership structure on firm performance in the time of economic crisis, we investigate how ownership concentration affects the likelihood that a financial institution fails during the crisis period. Unlike previous studies, we also examine the impact of political connection on the likelihood of financial institution closures. We use the data from Thailand to study this issue. Thailand provides a natural research setting because it was the first hit by the East Asian financial crisis in July 1997.

The results show that in the emerging market economy where ownership concentration and political connection are common and the legal environment is not really investor-friendly, ownership structure and political connection variables appear to play an important role when developing efficient early warning systems. The results are also consistent with the view that concentrated ownership structure of East

Asian firms has contributed to the East Asian economic crisis (e.g., Johnson, Boone, Breach, and Friedman (2000), Mitton (2002), and Lemmon and Lins (2003)). Specifically, we find that the presence of a foreign investor as the largest shareholder is related to the lower probability of financial institution failure, while greater voting rights held by the largest shareholders reduces the likelihood that a financial institution will be closed. This evidence supports the *monitoring effects* of controlling shareholders and *management quality* of foreign-controlled firms. Political connection also impacts the closure likelihood. However, only financial institutions with the Crown Property Bureau connection are less likely to be closed. Political connection through controlling families and state connection are not significant in determining the failure likelihood.

Consistent with existing research, financial factors help predict the probability of corporate failure. The CAMEL-type variables regarding capital adequacy, management quality, asset quality, and earnings ability appear to be significant factors determining the failure probability. More precisely, loan growth has a positive effect on the likelihood of financial institution failure, while the ratio of operating expense to revenue, return on assets, and the ratio of interest income to total income have negative effects.

This study also helps explain that there were significant weaknesses contributing to individual financial institution failure prior to the East Asian crisis. Moreover, the evidence of "too-big-to-fail" policies is found in the closure procedures of Thai financial institutions. As argued in Bongini, Claessens, and Ferri (2001), this may have enlarged the crisis in some ways. That is, to the degree that large financial institutions tend to have a connection with large business conglomerate, such policies may have diverted scarce funds away from other segments of the economy, such as small and medium firms, during the economy-wide crisis.

Our logistic prediction models show good predictive power. Importantly, the power is robust for the periods of one to five years prior to failure. Such evidence indicates that the models serve as timely sound early warning signals and could thus be useful tools adding to supervisory resources. More precisely, 86.25%, 87.27%, 84.87%, 80.36%, and 79.82% of financial institutions are correctly classified in the models that use the explanatory variables of one, two, three, four, and five years prior to the failure, respectively. Likewise, Type I (Type II) error of such models is 14.70%

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(13.04%), 15.79% (9.43%), 16.07% (14.29%), 28.00% (12.90%), and 24.49% (16.67%) respectively.

5.2 Suggestions for future research

There are a large number of studies focusing on the relations between ownership structure or political connection and performance. However, research on concentrated ownership structure, political connection, and corporate failure has been limited. Hence, it will be interesting in further conducting studies on this issue. At least the following three issues should be considered.

First, future research in business group affiliation and financial institution failure is promising. Previous research has studied the costs and benefits of business group affiliation. The impact of business groups on the incidence of corporate distressed has also been explored. However, very little research on how business group affiliation affects the likelihood of financial institution failures has been done. Hence, this can be an extension of this study.

Second, while we examine the role of ownership concentration and political connection factors in determining financial institution failures during the economic crisis, we do not examine the role of such factors on the resolution of corporate distress. In response to corporate distress, financial institutions may, for instance, choose to restructure their assets, capital structure, and debt, or even file for bankruptcy. The importance of ownership concentration and political connection factors on the resolution choices of corporate distress can be interesting future research.

Third, as mentioned in Chapter 2, not until 1990 have corporate distress/failure prediction models applied neural network approaches. Since then, there have been many studies involving neural network approaches in developing distress/bankruptcy prediction models. Based on his review, Atiya (2001) concludes that in general, a neural network approach outperforms statistical techniques in predicting corporate distress/bankruptcy. Interestingly, Atiya's review shows that there is still a gap in the established body of knowledge in this area. To the best of our knowledge, no neural network application that incorporates ownership structure and political connection characteristics to predict the likelihood of financial institution failures has been documented. Therefore, it should be worthwhile to develop neural network prediction

models incorporating ownership structure, political connection and financial variables as predictors.

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