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**EMPIRICAL ESSAYS ON INDONESIAN BANKING: CRISIS AND
INSTITUTIONAL REFORMS**

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«La faculté n'entend donner aucune approbation ou improbation aux opinions émises dans les thèses; ces opinions doivent être considérées comme propres à leurs auteurs.»

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INTRODUCTORY CHAPTER

Since 1983, Indonesian banking experienced significant changes when banking deregulation encouraged the unidirectional relationship between financial sector development and the overall economic development. The deregulation packages in 1983 eliminated direct control system in the monetary sector. To enhance the mobilization of public funds for financing of country development and to improve the efficiency and competitiveness of banking, the Indonesian government then issued complement deregulation package of October 1988 through the establishment of banks, simplicity in opening branch offices and decreasing reserve requirements. These banking liberalization policies were suspected as one of the exacerbating factors in the effects of the economic crisis of 1997-1998. Indonesia experienced a sharper drop of the currency than other countries. The closure of 16 insolvent banks led to bank runs in almost all banks in Indonesia. To prevent the collapse of the national banking system, the government had to inject funds to banks in a very huge amount known as *Bantuan Likuiditas Bank Indonesia* (liquidity assistance scheme). Moreover, Indonesian government, in January 1998, introduced a blanket guarantee scheme for domestic banks to restore confidence in the national banking system (Hadad *et al.*, 2011).

The 1997/1998 financial crisis had also created severe consequences regarding the intermediation function of Indonesian banks. In the aftermath of the crisis, a credit crunch phenomenon occurred in the Indonesian banking system in which banks were reluctant to grant new loans. The banks' reluctance to grant loans was also considered the result of excessive bank lending behavior during the banking deregulation regime that amplified the impact of the financial crisis. Therefore, banks then behaved very carefully in their lending activities. This credit crunch led to a sharp decrease in intermediation, as shown by a lower ratio of loans to deposits. Banks then charged a strangling interest rate on loans to cover their intermediation costs.

The Indonesia's institutional reforms which were implemented in the latter half of 1998 have led the country to become more democratized, decentralized, and deregulated (Mursitama, 2006; Henderson and Kuncoro, 2011; Arifin *et al.*, 2013). As a part of the institutional reforms, the Indonesian government has also

developed various improvements in the banking system, such as the Central Bank independence, an increase in the minimum capital requirement, implementation of related lending limitations and good governance rules. The government has also replaced the blanket guarantee scheme with the limited guarantee scheme in September 2005. A number of regulations have also been implemented to promote a more healthy banking competition, improve market discipline, and subsequently to improve the efficiency and the strength of banking sector.

These banking reforms might have improved soundness and profitability of Indonesian banks, however, some important issues still remain. First, as argued by Fisman (2001), political connectedness¹ was one of the roots of the 1997/1998 crisis in Southeast Asia especially in Indonesia, as it was the primary determinant of firm profitability and had led to distorted investment decisions. Before the reforms, political connectedness in banking was concerned the issue of related lending which led to tunneling problems². Banks channeled credit, especially to their own business groups, driven by political motive or backed up by political connections (Mc Beth, 1994; Bennet, 1995; Leuz and Oberholzer-Gee, 2006)³. After the crisis and the reforms, many banks are, however, still politically connected by recruiting former bureaucrats and politicians for banks' board of commissioners and board of directors. Some others are politically connected because they are controlled by political figures. How do political connections play role in banking? We argue that banks invest in political connections because the benefits these connections would provide are higher than the cost banks would

¹ The paradigm of the Indonesian new order (*Orde Baru*) regime on "trickle-down economics" in which growth as the most important element in the economic development argued that to accelerate the economic growth, the government should provide incentives to business. It was hoped that this economic policy would lead to common prosperity because the trickle-down effect could also reach the poor. Consequently, this policy created political patronages between those who possess political power and a number of conglomerates (Fisman, 2001; Mobarak and Purbasari, 2006; Dieleman and Sachs, 2008). Claessens *et al.* (2000) show that 57.7 percent of market capitalization in the stock exchange was controlled by 10 families. Fisman (2001) exhibits that 25 politically connected conglomerates contributed around 30 percent of total GNP.

² Expropriation to minority shareholders, particularly through tunneling, has been extensively studied in the literature, more so after the Asian crisis in the late '90s which gave role to expropriation as an aggravating factor in this crisis (Claessens *et al.*, 2000; Hamada and Konishi, 2010).

³ Wihlborg *et al.*, (2001) also classify Indonesia as "extremely debtor friendly" regarding the debtor orientation based on the formal laws and its effectiveness.

bear. Particularly in an unsophisticated and turbulent banking environment, political connections could be a valuable resource for banks, enabling them to more easily obtain resources in the form of deposits. Depositors might perceive politically connected banks as less risky because banks' political connections are expected to implicitly guarantee that the government would rescue them in case of distress and depositors could thus more easily recover their funds. Moreover, we also suppose that the effect of political connections is higher after the implementation of the limited guarantee because not all deposits are insured.

Second, as pointed out by some studies, the cost of financial intermediation- which is considered to reflect the banking efficiency- in Indonesia is still higher than other countries, particularly in East Asia, even though a number of improvements have been addressed to improve the efficiency of financial intermediation. Why have bank interest margin in Indonesia been so high? What matters for Indonesian banks?

The third issue is regarding the disparity in banking development across region. Why does the unequal financial deepening still exist even though decentralization policy has been implemented? Based on the law and finance theory⁴ (La Porta *et al.*, 1997, 1998, 1999, 2000), we argue that the main determinant of regional disparity in banking development is related to the local governance. The quality of local government is important to ensure that legal institutions are well-imposed especially with regard to the creditor/ lender rights to stimulate banks in channeling credit. In addition, bureaucratic procedure in doing business indicates to which extent the local government is capable of facilitating a favorable business climate to attract business investments. We also contend that the level of financial deepening is determined by socioeconomic conditions. In the socioeconomically less developed regions, banks lack incentives to release credit as the information as well as the quality of borrowers are

⁴ The law and finance theory contends that legal institutions factors such as legal origin, credit rights, rule of law and the effectiveness of their enforcement matter to explain some aspects of finance, for instance credit to private sector, capital market development, investor protection and cost of financial intermediation. La Porta *et al.* (1999) categorize Indonesia legal law as civil law, more specifically French legal origin.

deficient. Banks face expensive costs in terms of information and dealing costs to grant loans.

Objectives and contents of the dissertation

Indonesian banking has undergone various improvements after the severe 1997/1998 financial crisis. The main objective of this dissertation is to investigate the impact of institutional and banking reforms which have been implemented following the crisis on the financial intermediary performance of Indonesian banks. More specifically, first, we examine the impact of banks' political connections on the deposit market before and after the implementation of formal deposit insurance in Indonesia. Second, we analyze the determinants of net interest margins of Indonesian banks that have experienced a problem of persistently high net interest margins since the 1997/1998 financial crisis. Third, we investigate the determinants of unequal financial deepening across regions in Indonesia by considering local governance and socioeconomic conditions as the main factors.

This dissertation consists of three papers. The chapter 1 of this dissertation investigates the whether banks' political connections affect depositors' choice (supply function), under different deposit insurance systems. We take advantage of the implementation of a limited guarantee system in Indonesia to replace the blanket guarantee scheme to analyze the potential effect of political connections on the supply of funds under two such systems. The value of banks' political connections is supposedly higher after the implementation of the limited guarantee because not all deposits are insured. We use quarterly individual data for 109 banks from 2002 to 2008 to estimate a simultaneous equations panel data model. We find evidence that the supply of funds is higher for politically connected banks compared to their non-politically connected counterparts. We also find that the impact of political connections on the supply of funds is stronger after the removal of the guarantee regime.

Chapter 2 emphasizes on the determinants of net interest margins in Indonesia after the 1997/1998 financial crisis. We use data from 93 commercial

banks from 2001 through 2009. We estimate the empirical model using pooled regression techniques as well as static and dynamic panel methods. Our results confirm that the structure of loan portfolios matters in the determination of interest margins. Operating costs, market power, risk aversion and liquidity risk have positive impacts on interest margins, while credit risk and cost to income ratio are negatively associated with margins. Our results also corroborate the loss leader hypothesis on cross-subsidization between traditional interest activities and non-interest activities. State-owned banks set higher interest margins than other banks, while margins are lower for large banks and for foreign banks.

In chapter 3, we investigate the determinants of financial deepening across regions in Indonesia after the institutional reforms which brought the country to become more decentralized. Using provincial-level data for 33 provinces from 2004 to 2010, we find that poor local governance significantly impedes financial deepening. Our results also conclude that in the socioeconomically less developed regions, the level of financial deepening is lower than that of more developed regions. Even though decentralization has been implemented, regional disparity in the form of financial deepening still exists.

CHAPTER 1

POLITICAL CONNECTIONS, BANK DEPOSITS, AND FORMAL DEPOSIT INSURANCE: EVIDENCE FROM AN EMERGING ECONOMY⁵

⁵ This chapter is based on a paper entitled “Political connections, bank deposits, and formal deposit insurance: Evidence from an emerging economy” co-authored with Emmanuelle Nys and Amine Tarazi.

1.1 Introduction

Worldwide, politics remarkably influences business, particularly in countries with high level of corruption, weak legal systems and poor governance (Faccio, 2006). Three main channels of political influence on business have been outlined in the literature. Firstly, the grabbing hand theory (Shleifer and Vishny, 1994, 1998) states that public firms are exploited to fulfill the interests of politicians and bureaucrats under their control. Secondly, the rent seeking theory posits that bureaucrats rent their position by providing privileges to businessmen in exchange for bribes (Krueger, 1974). Finally, the last channel concerns politically connected firms, those with political figures on their boards or those which have close relationships with those who possess political power.

Studies on politically connected firms show political linkages can affect firms both positively and negatively. On one hand, some empirical studies find several benefits of political connections, including, i) easier access to financial resources, such as bank loans and others funds, at more convenient conditions (Charumilind *et al.*, 2006; Claessens *et al.*, 2008; Fraser *et al.*, 2006; Khwaja and Mian, 2005; Li *et al.*, 2008); ii) increased confidence in the legal system (Li *et al.*, 2008); iii) improved performance (Johnson and Mitton, 2003); iv) a higher probability of bail-out (Faccio *et al.*, 2006); v) an increase in firm value through, for example, increased stock value (Goldman *et al.*, 2009); and vi) lower-cost equity capital (Boubakri *et al.*, 2012). On the other hand, some studies find political connections negatively impact firms. These negative impacts include, i) lesser-quality accounting information (*e.g.* reported earnings) (Chaney *et al.*, 2011); ii) appointed managers and directors with lesser qualifications (Boubakri *et al.*, 2012; Leuz and Oberholzer-Gee, 2006); iii) a decrease in long term performance due to lower managerial incentives and/or inefficiency (Claessens *et al.*, 2008; Fan *et al.*, 2007); and iv) higher-cost debt (Bliss and Gul, 2012).

While the political connections of non-financial firms are well documented in the literature, the impact of political connections on banks is less studied. Most papers on the role of politics in the banking industry compare the profitability, lending behavior and risk-taking of state-owned (government) banks

with those of private banks. Molyneux and Thornton (1992) find government ownership has a positive impact on bank profitability. Sapienza (2004) documents how state-owned banks charge similar or identical firms lower interest rates than do private banks. Moreover, the lending behavior of state-owned banks is influenced by the electoral performance of the party affiliated with those banks. Dinc (2005) concludes government banks increase their lending in election years relative to private banks, particularly in developing countries.

In this paper, we study the role banks' political connections play in attracting deposits, and whether the type of deposit insurance in place influences this role. Specifically, we investigate whether formal insurance with limited coverage – which is expected to credibly exclude some creditors – outweighs, to some extent, the benefits of being politically connected or if it provides more value to political connections. We start by investigating whether banks' political connections effectively impact the supply of funds, i.e. whether these connections facilitate access to deposit funding. The general argument is that banks invest in political connections because the benefits these connections would provide are higher than the cost banks would bear. Particularly in an unsophisticated and turbulent banking environment, political connections could be a valuable resource for banks, enabling them to more easily obtain resources in the form of deposits⁶. Depositors might perceive these banks as less risky because banks' political connections are expected to implicitly guarantee that the government would rescue them⁷ in case of distress and depositors could thus more easily recover their funds.

We then introduce a change in the regulatory environment and more specifically in the deposit insurance system. We investigate whether this potential added value of being politically connected is identical under a blanket guarantee regime and a limited guarantee system. Looking at both environments will reveal insights into the relative effectiveness of implementing deposit insurance with

⁶ Collecting deposits is an important activity for banks. Banks have specific characteristics in how they fund their assets by collecting deposits from the public, and in how they then use these deposits to finance their loans to generate income. Therefore, they need to attract more deposits to support their increased lending activities as deposits are considered cheaper and more stable than other sources of funding.

⁷ Faccio *et al.* (2006) show that politically connected firms are more likely to be bailed out.

limited coverage. By credibly excluding some creditors, formal deposit insurance is expected to increase the monitoring efforts of bank creditors and market participants. Several studies examine depositors' behavior when a blanket guarantee system is replaced with a limited guarantee system. For instance, Imai (2006) finds that the deposit insurance reform in Japan, which shifted the country from a blanket guarantee system to a limited guarantee system, has enhanced market discipline by increasing the sensitivity of deposit interest rates and by increasing the sensitivity of deposit quantity to default risk. However, this paper also concludes that the reform led to more frequent and more generous too big to fail policies. Hadad *et al.* (2011) obtain mixed results with regard to market discipline while considering regulatory changes in Indonesia after the 1997/1998 financial crisis. Concerning the adoption of a blanket guarantee system and later on by the limited guarantee system, they show that the need for market discipline in the banking industry has been lessened. In the present paper we address the issue of the credibility of the explicit deposit insurance and therefore of the effectiveness of market discipline – i.e. depositors believe that banks might fail – by studying whether the added value of being politically connected is different during the blanket guarantee scheme and the limited guarantee system. If explicit deposit insurance credibly excludes some creditors and insolvent banks do actually fail (no bail-out policy), then political connections will have less value. If however, insolvent banks can still, to some extent, benefit from some sort of support, political connections will have more value.

We study the case of Indonesian banks, which have undergone two regulatory changes related to deposit insurance during the time period we cover. We take advantage of the introduction of a limited guarantee (LG) system to replace a blanket guarantee scheme (BGS) in Indonesian banking. When the 1997/1998 financial crisis was at its height, the Indonesian government closed 16 small banks, which led to bank runs in almost all banks. To prevent the collapse of the overall banking system, the government consequently had to inject a very large amount of last resort loans (Kane and McLeod, 2002; Djiwandono, 2004). Thus, to restore depositors' confidence, a blanket guarantee of all deposits and other liabilities (except equity and subordinated debt) was introduced in January

1998 (Kane and McLeod, 2002; McLeod, 2005; Hadad *et al.*, 2011). The BGS applied to all commercial banks in Indonesia, except for the branch offices of foreign banks. In other words there was an explicit insurance that all banks would be bailed out, except the foreign ones⁸. Then, after several improvements to the banking system, such as an increase in the minimum capital requirement⁹, implementation of related lending limitations¹⁰, Central Bank independence¹¹, and good governance rules, the limited guarantee scheme replaced the blanket guarantee scheme in September 2005. We look in this paper at the impact of banks' political connections within these two different regulatory environments.

In our study, we use detailed information on banks' political connections. Since the 1997/1998 crisis, banks' political connections consist of recruiting former bureaucrats and politicians for banks' board of commissioners and board of directors. We consider two types of politically connected banks: state-owned banks and politically connected private banks. We define the latter as those banks with at least one politically connected commissioner, director, or controlling shareholder. We use more detailed information than in previous literature on banks' political connections. Most papers on the role of politics in the banking industry focus on banks' ownership. In the present paper, we investigate more deeply by looking not only at political connections of state-owned banks, but at politically connected private banks, as well. Our paper is thus related to Carreta *et al.* (2012), who consider the role of politicians on bank boards through a study of Italian cooperative banks. They find that banks with politically connected

⁸ Banks that participate in the BGS have to pay a fixed-rate premium of 0.25% of deposits per year. The Indonesian Bank Restructuring Agency (IBRA) was assigned to manage the BGS (Hadad *et al.*, 2011).

⁹ The regulation with regard to capital requirement has changed twice since the 1997/1998 financial crisis. In November 1998, the minimum CAR was temporarily reduced from 8% to 4% of the risk weighted assets; it then returned to 8% in December 2001 (Hadad *et al.*, 2011)

¹⁰ In January 2005, the Central Bank enforced a strict regulation on a bank's lending limitation to its related parties. The maximum related lending is 10% of bank capital. A related party is defined as any natural person or company/entity exercising control over the bank, whether directly or indirectly, through ownership, management, and/or financial links (Hamada and Konishi, 2010).

¹¹ Central Bank independence was enacted on May 17, 1999 based on Act (UU) No. 23/1999 on Bank Indonesia, and has been amended with Act (UU) No.3/2004 on January 15, 2004. The Act states the status and position of Bank Indonesia as an independent state institution and its freedom from interference by the Government or any other external parties.

directors have higher net interest revenues, lower loan portfolio quality and lower efficiency than banks without such connections.

We use a simultaneous equations panel data model of supply and demand for funds. We base our investigation on quarterly data from 2002 to 2008 by separating the two deposit insurance environments under which Indonesian banks have operated: the pre-deposit insurance state with blanket guarantee until the third quarter of 2005 and the post-deposit insurance state thereafter. We do find that politically connected banks collect deposits at better conditions. But after the limited guarantee replaced the blanket guarantee, political connections play a stronger role. This result indicates that the explicit deposit insurance system with limited guarantee in Indonesia is credible but only to some extent. Depositors do seem to believe that banks may fail, but they prefer to deposit their funds in politically connected banks because they still believe those banks are less likely to fail.

The remainder of this chapter is organized as follows. Section 1.2 presents the hypotheses we test. Section 1.3 presents the data and the econometric simultaneous equations model. Section 1.4 reports the empirical results and robustness checks. Section 1.5 concludes the paper.

1.2 Hypotheses Development

The focus of the present study is to investigate whether banks' political connections affect depositors' choice (supply function), under different deposit insurance systems.

On one hand, the literature on market discipline imposed by depositors argues that depositors are sensitive to the riskiness of banks¹². On the other, the political connections literature contends that stronger connections will increase the probability of bail-out. In line with Faccio *et al.* (2006), such banks are more

¹²Market discipline in banking is defined as a condition in which stockholders, depositors, or creditors face costs that increase as banks undertake higher risk strategies, and take action on the basis of these costs (Berger, 1991). Martinez-Peria and Schmukler (2001) show uninsured depositors may take action by requiring higher interest rates or by withdrawing their deposits.

likely to be rescued by the government through, for instance, capital injection. We therefore hypothesize that political connections enable banks to collect deposits more easily, as the connections implicitly guarantee these banks will not fail.

H1: Supply of funds is higher for politically connected banks than for those which are non-politically connected

Moreover, we examine whether a change in the deposit insurance system impacts the role played by political connections regarding the supply of funds. We take advantage of the implementation of a limited guarantee system in Indonesia to replace the blanket guarantee scheme to analyze the potential effect of political connections on the supply of funds under two such systems. The value of banks' political connections is supposedly higher after the implementation of the limited guarantee because not all deposits are insured. Thus, if political connections have more value under the limited guarantee system, we conjecture that such a system (with limited guarantee) is credible but only to some extent, in that although depositors actually believe that banks might fail, they also expect highly connected banks to still benefit from public support. We therefore expect that the effect of banks' political connections on the supply of funds will be stronger during the limited guarantee period than during the blanket guarantee period.

H1': Banks' political connections have a stronger impact under a limited guarantee system than a blanket guarantee system because although depositors are convinced that banks can actually fail, they still expect connected banks to benefit from public support.

1.3 Data, Methodology, and Variables

1.3.1 Data

Indonesian banks consist of conventional and Islamic commercial banks (which can be regional development banks, state-owned banks, foreign-owned banks, joint-venture banks and domestic-private banks) as well as rural banks. In this study, however, we exclude Islamic banks and rural banks from our sample

and keep only conventional commercial banks¹³. Our sample consists of 109 commercial banks. Information comes from the Indonesian Central Bank (Bank Indonesia) which provided us with banks' quarterly financial statements over the 2002 – 2008 period (Q1:2002 – Q2:2008). Macroeconomic data come from Bank Indonesia, and Indonesia Statistics Bureau (BPS).

We take several steps to classify politically connected private banks. First, we gather the names of bank commissioners, directors and owners from banks' quarterly financial statements. Second, we collect these individuals' biographies from the banks' annual reports, OneSource database, and the directory data of Indonesian Banks Association in order to determine whether they have political backgrounds. Finally, we manually retrieve data from various websites to check the information obtained in the second step and to complete information not found in the previous steps (detailed data sources are provided in table A1, column 3, appendix A).

1.3.2 Methodology

To investigate the effect of political connections on the supply of funds we consider a structural model of deposit demand and supply, where the supply and demand functions for funds are as follows:

$$\begin{aligned}
 (\text{Supply of funds})_{i,t} = f & (\text{Interest}_{i,t}, \text{Political Connections}_{i,t}, \text{Bank Fundamentals}_{i,t-1}, \\
 & \text{Deposit Insurance}_t, \text{Political Connections}_{i,t} * \text{Deposit} \\
 & \text{Insurance}_t, \text{Foreign Own Bank}_{i,t}, \text{Macroeconomics}_t) \\
 & \dots\dots\dots (1)
 \end{aligned}$$

$$\begin{aligned}
 (\text{Demand of funds})_{i,t} = f & (\text{Interest}_{i,t}, \text{Bank Fundamentals}_{i,t-1}, \text{Loan Growth}_{i,t}, \\
 & \text{Listed}_{i,t}, \text{Macroeconomics}_t, \text{Market Structure}_t) \\
 & \dots\dots\dots (2)
 \end{aligned}$$

¹³ We exclude Islamic banks and rural banks because of their specificities. In 2008, the asset share of rural banks was only 1.39% of the banking industry, and the asset share of Islamic banks was 2.11% of the banking industry (Indonesian banking statistics, 2012)

where $Interest_{i,t}$ is the interest rate on deposits of bank i at quarter t , $Political\ Connections_{i,t}$ is the political status of bank i at quarter t , $Bank\ Fundamentals_{i,t-1}$ represents a vector of bank specific variables of bank i included with a quarter lag to avoid endogeneity issues. The literature underlines four major variables as bank fundamentals: bank profitability, bank risk, bank liquidity and bank size. $Deposit\ Insurance_t$ is the deposit insurance system in place at time t . $Political\ Connections_{i,t} * Deposit\ Insurance_t$ is an interaction term to test hypothesis 1'. $Foreign\ Own\ Bank_{i,t}$ is a dummy variable that takes the value of 0 if the bank is domestic and 1 if it is foreign. $Loan\ Growth_{i,t}$ is the rate of loan growth of bank i at quarter t . $Listed_{i,t}$ is a dummy variable, which identifies banks listed on the Indonesian market. $Macroeconomics_t$ and $Market\ Structure_t$ are exogenous control variables, which change over time but not across individuals.

In this paper, we simultaneously estimate the demand and supply of funds on our panel dataset, using a 3SLS procedure¹⁴. We focus on the simultaneous equation results as it allows us to address simultaneity and endogeneity issues. We follow the Plumper and Troeger (2007) methodology to estimate simultaneous equations on panel data with individual-invariant and dummy variables (which rarely vary in the time dimension). The procedure is detailed in appendix 2.

The supply of funds (equation 1) and the demand for funds (equation 2) can be rewritten as follows:

$$\begin{aligned}
 (Deposits)_{i,t} = f & (Interest_{i,t}, Political\ Connections_{i,t}, Bank\ Fundamentals_{i,t-1}, \\
 & Macroeconomics_t, Deposit\ Insurance_t, Political \\
 & Connections_t * Deposit\ Insurance_t) \dots\dots\dots(3)
 \end{aligned}$$

$$\begin{aligned}
 (Interest)_{i,t} = f & (Deposits_{i,t}, Bank\ Fundamentals_{i,t-1}, Loan\ Growth_{i,t}, \\
 & Macroeconomics_t, Market\ Structure_t) \dots\dots\dots (4)
 \end{aligned}$$

where equation 4 is the inverse function of deposit demand (as presented in equation 2).

¹⁴ We also estimate the equations using GMM. Results are still the same.

1.3.3 Variables

Our dependent variables are bank deposits for the supply function and interest rate on deposits for the demand function. In line with Imai (2006), we use the natural log of deposits (LNDEP) as a proxy for the quantity of bank deposits. To measure the interest rate on deposits, we follow Martinez-Peria and Schmukler (2001) and Hadad *et al.* (2011) and use the implicit deposit interest rate (INTDEP) measured as the ratio of interest expenses to total deposits.

As we estimate a simultaneous equations model, the amount of deposits (LNDEP) appears as an explanatory variable in the demand function, and the interest rate on deposits (INTDEP) as an explanatory variable in the supply function.

The literature on the deposit market emphasizes the role of bank characteristics (bank fundamentals) to explain the supply and demand for funds: these variables are bank risk, bank liquidity, bank profitability and bank size. One can expect that depositors would leave a bank for a safer one or require higher interest rates from riskier banks, less liquid banks, unprofitable banks and smaller banks. To measure bank risk, we use the ratio of non-performing loans to total loans (NPL). The supply of funds is inversely related to banks' riskiness (Martinez-Peria and Schmukler, 2001; Fueda and Konishi, 2007). When bank risk increases its default probability is higher leading to larger potential losses for depositors. On the demand side, riskier banks have to increase the deposit rate they offer to attract deposits (Martinez-Peria and Schmukler, 2001). The ratio of liquid assets to total assets (LATA) is used in this study as a measure of liquidity risk. Banks with a large volume of liquid assets are perceived to be safer, because these assets would allow them to meet unexpected withdrawals (Martinez-Peria and Schmukler, 2001; Finger and Hesse, 2009). Therefore, the supply of funds should be higher for liquid banks and less liquid banks should pay a higher interest rate to attract deposits (Martinez-Peria and Schmukler, 2001; Hadad *et al.*, 2011). Bank profitability is measured by the ratio of return on assets (ROA). Higher bank profits are expected to signal better bank soundness making things easier to attract funds/deposits (Martinez-Peria and Schmukler, 2001; Hori *et al.*, 2009; Finger and Hesse, 2009). On the demand side, we might expect higher

profitability to enable banks to offer lower rates (Martinez-Peria and Schmukler, 2001, Hori *et al.*, 2009). In the present study, we use, as a proxy of bank size, a dummy variable that identifies the ten largest banks in Indonesia (TEN). Large banks are perceived as systemically important banks that would most likely be bailed out by the government if they collapse (Imai, 2006; Onder and Ozyildirim, 2008). Therefore we expect a higher supply of funds for these too-big-to-fail banks, and a lower interest rate paid on deposits (Mondscean and Opiela, 1999; Opiela, 2004; Onder and Ozyildirim, 2008; Hadad *et al.*, 2011).

Bank control variables are also introduced. We take into account the bank's rate of loan growth (Loan Growth), as fast growing banks should demand more deposits. We also control for listed banks (LISTED). Publicly traded banks may have an easier access to market financing, which thus reduces their dependency on deposits; their demand of funds should be lower. In the supply function, we consider whether banks are domestic or foreign (FOB). Indeed, foreign banks did not benefit from the blanket guarantee scheme in Indonesia, but they benefit from the limited guarantee system introduced thereafter (Hadad *et al.*, 2011). Therefore, one can expect the supply of funds to be lower for foreign banks than for domestic banks, especially before the limited guarantee system. Foreign banks consist of branches of foreign banks, subsidiaries of foreign banks, and joint venture banks.

Macroeconomic factors may also impact the deposit market. The macroeconomic controls for the supply function are inflation, business cycle, and the Treasury Bill interest rate. The supply of funds is expected to increase during booms and/or higher inflation periods. But an increase in inflation could also induce a shift to other types of assets (real estate...). The business cycle variable (CYCLE) has been defined applying the Hodrick-Prescott method¹⁵ to the Indonesian real GDP per capita. When the Treasury bill interest rate (TBILL) increases, the opportunity cost of holding funds increases. One can therefore expect a decrease in the supply of funds. On the demand side, we expect that when the interest rate on treasury bills (TBILL) increases, the interest rate on deposits will increase as well. We also take into account the effect of market

¹⁵The Hodric-Prescott filter decomposes a time series into orthogonal components that can be regarded as "trend" and "cycle" (Mise *et al.*, 2005).

structure on bank deposits using a Herfindahl-Hirschman Index (HHI). When banking market concentration increases, we expect the deposit interest rate to diminish.

Corporate political connections are well documented in the corporate finance literature. Previous studies have used several proxies to classify politically connected firms such as i) firms, which have government bureaucrats as board members (Fan *et al.*, 2007; Francis, *et al.*, 2009), ii) closeness to the country's president or top politicians (Fisman, 2001; Mobarak and Purbasari, 2005; Leuz and Oberholzer-Gee, 2006; Adhikari *et al.*, 2006), iii) firms' owners that are members of a political party (Li *et al.*, 2008), and iv) firms which provide contributions during general elections (Hilman *et al.*, 1999; Claessens *et al.*, 2008).

In our work, we follow the most commonly used measure of corporate political connections, which is government bureaucrats and politicians on the board. Indonesia has a dual board system whereby each bank has a board of commissioners and a board of directors. The board of commissioners performs the supervisory and advisory roles, while the board of directors performs the executive roles (Nam and Nam, 2004). We consider two kinds of politically connected banks: the first ones are state-owned banks¹⁶, and the second ones are private banks which have at least one of their owners, commissioners, or directors who is a political party member¹⁷, a parliament member¹⁸, a government official (including military and central bank officer), a former of parliament member and/or a former of government official.

Hence, our sample identifies two types of banks:

- the politically connected banks (POL);

¹⁶ We classify state-owned banks as politically connected banks because they are directly connected to the government under the form of ownership. In addition, on the board of commissioners of state-owned banks, at least one of the commissioners is a government representative as a majority shareholder. We here follow Francis *et al.* (2009).

¹⁷ We include membership in political parties because as party members, they can interact with government officials and managers of state-owned enterprises and can build up connections with key political and economic figures (Li *et al.*, 2008).

¹⁸ We account for parliament members as the parliament has the possibility to present laws, and has authority to select the officers of state institutions (for example: governor and deputy governor of the Central Bank).

- the non-politically connected banks (NON POL).

We then distinguish between the politically connected banks depending on their ownership. We have:

- state-owned banks (SBPOL);
- politically connected private banks (PBPOL).

Finally, for private banks, we take the type of political connection into consideration. We divide PBPOL into three different categories based on who is politically connected and on the nature of the political links:

- private banks for which at least one of their controlling shareholders or commissioners is politically connected as a government official (including military and central banks officer) or a former government official (GOVOFF);
- private banks for which at least one of their controlling shareholders or commissioners is politically connected as a political party member, a parliament member or a former parliament member (PAR);
- private banks for which at least one of their directors is politically connected (DIR).

To investigate the implications of the move from one deposit insurance system to the other in Indonesia, we use a dummy variable (LG), which represents the period covering the explicit deposit insurance system with limited guarantee. However, because we assume that depositors anticipate the reform, the dummy variable starts taking the value of 1 two quarters before the limited guarantee scheme is enacted. To measure the effect of political connections on the demand for deposits during the formal deposit insurance period, we interact political connections variables with the dummy variable standing for limited guarantee (POL*LG, SBPOL*LG, PBPOL*LG, GOVOFF*LG, PAR*LG, and DIR*LG).

Detailed data on the number of banks based on their political connections each year are presented in table C1, appendix C. The descriptive statistics of all

our variables are in table C2, appendix C. The correlation matrix is reported in table D1, appendix D.

Equations 5 and 6 are derived from the empirical model presented in equations 3 and 4. In this first set, we have one proxy for politically connected banks (POL) in the supply of funds equation.

$$LNDEP_{i,t}^d = \alpha_0 + \alpha_1 INTDEP_{i,t} + \alpha_2 POL_{i,t} + \alpha_4 LG_t + \alpha_5 POL*LG_{i,t} + \alpha_6 NPL_{i,t-1} + \alpha_7 LATA_{i,t-1} + \alpha_8 ROA_{i,t-1} + \alpha_9 TEN_{i,t} + \alpha_{10} FOB_i + \alpha_{11} INFLATION_t + \alpha_{12} CYCLE_t + \alpha_{13} TBILL_t + \varepsilon_{i,t} \dots \dots \dots (5)$$

$$INTDEP_{i,t}^s = \alpha_0 + \alpha_1 LNDEP_{i,t} + \alpha_2 NPL_{i,t-1} + \alpha_3 LATA_{i,t-1} + \alpha_4 ROA_{i,t-1} + \alpha_5 TEN_{i,t} + \alpha_6 LOANGROWTH_{i,t} + \alpha_7 LISTED_i + \alpha_8 CYCLE_t + \alpha_9 T-BILL_t + \alpha_{10} HHI_t + \varepsilon_{i,t} \dots \dots \dots (6)$$

In equations 7 and 8, we then consider two proxies for political connections in the supply function: state owned banks (SBPOL) and private banks (PBPOL).

$$LNDEP_{i,t}^d = \alpha_0 + \alpha_1 INTDEP_{i,t} + \alpha_2 SBPOL_{i,t} + \alpha_3 PBPOL_{i,t} + \alpha_4 LG_t + \alpha_5 SBPOL*LG_{i,t} + \alpha_6 PBPOL*LG_{i,t} + \alpha_7 NPL_{i,t-1} + \alpha_8 LATA_{i,t-1} + \alpha_9 ROA_{i,t-1} + \alpha_{10} TEN_{i,t} + \alpha_{11} FOB_i + \alpha_{12} INFLATION_t + \alpha_{13} CYCLE_t + \alpha_{14} TBILL_t + \varepsilon_{i,t} \dots \dots \dots (7)$$

$$INTDEP_{i,t}^s = \alpha_0 + \alpha_1 LNDEP_{i,t} + \alpha_2 NPL_{i,t-1} + \alpha_3 LATA_{i,t-1} + \alpha_4 ROA_{i,t-1} + \alpha_5 TEN_{i,t} + \alpha_6 LOANGROWTH_{i,t} + \alpha_7 LISTED_i + \alpha_8 CYCLE_t + \alpha_9 T-BILL_t + \alpha_{10} HHI_t + \varepsilon_{i,t} \dots \dots \dots (8)$$

In equations 9 and 10, we include detailed proxies for politically connected private banks, which depend on the nature of the political links: GOVOFF, PAR, and DIR.

$$LNDEP_{i,t}^d = \alpha_0 + \alpha_1 INTDEP_{i,t} + \alpha_2 SBPOL_{i,t} + \alpha_3 GOVOFF_{i,t} + \alpha_4 PAR_{i,t} + \alpha_5 DIR_i + \alpha_6 LG_t + \alpha_7 SBPOL*LG_{i,t} + \alpha_8 GOVOFF*LG_{i,t} + \alpha_9 PAR*LG_{i,t} + \alpha_{10} DIR*LG_{i,t} + \alpha_{11} NPL_{i,t-1} + \alpha_{12} LATA_{i,t-1} + \alpha_{13} ROA_{i,t-1}$$

$$+ \alpha_{14}TEN_{i,t} + \alpha_{15}FOB_i + \alpha_{16}INFLATION_t + \alpha_{17}CYCLE_t + \alpha_{18}TBILL_t + \varepsilon_{i,t} \dots \dots \dots (9)$$

$$INTDEP^s_{i,t} = \alpha_0 + \alpha_1LNDEP_{i,t} + \alpha_2NPL_{i,t-1} + \alpha_3LATA_{i,t-1} + \alpha_4ROA_{i,t-1} + \alpha_5TEN_{i,t} + \alpha_6LOANGROWTH_{i,t} + \alpha_7LISTED_i + \alpha_8CYCLE_t + \alpha_9T-BILL_t + \alpha_{10}HHI_t + \varepsilon_{i,t} \dots \dots \dots (10)$$

1.4 Results and Robustness checks

1.4.1 Results

We examine the impact of banks' political connections on the supply of funds by estimating the supply and demand functions of deposits using simultaneous equations panel data techniques. One of the focuses of this study is whether or not politically connected banks face a higher supply of funds. We also investigate whether there is a difference on the effect of banks' political connections under two different deposit insurance systems.

Results for equations (5) and (6), for equations (7) and (8), and for equations (9) and (10) are respectively presented in tables 1, 2, and 3.

Table 1 presents the results for the structural model where all the politically connected banks (either private or state-owned) are distinguished from the non-connected institutions (POL). The last two columns of the table show the results when the limited guarantee dummy variable and the associated interaction terms are introduced in the supply function. Table 2 shows the results with a more detailed breakdown for political connections: state-owned banks (SBPOL) and politically connected private banks (PBPOL). Finally, estimation results for the set of state-owned banks and the three different proxies of politically connected private banks (GOVOFF, PAR, and DIR) are reported in table 3.

Table 1. Regressions Results on the Full Sample (Equations 5 & 6)

This table presents the results of simultaneous equations. LNDEP is the natural log of deposits. INDEP is the ratio of interest expenses to deposits. POL is the dummy variable for politically connected banks. NPL, LATA, ROA, and TEN are proxies of credit risk, liquidity risk, profitability, and bank size, respectively. LISTED is the dummy variable for publicly traded banks. FOB is the dummy variable for foreign banks. INFLATION is the inflation rate, CYCLE is the cycle of GDP per capita, TBILL is the interest rate on 1 month Treasury bill, and HHI is the squares of the market shares (assets) of all banks. LG identifies the limited guarantee system, POL*LG are the interactions of LG and POL. The values in parentheses are p-values. Standard errors are corrected for heteroskedasticity following White's methodology. *, ** and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Expected Sign		Model			
	Supply eq.	Demand eq.	Supply (Dep. Variable: LNDEP)	Demand (Dep. Variable: INTDEP)	Supply	Demand
Constant			12.68*** (0.000)	0.046** (0.000)	12.66*** (0.000)	1.574** (0.000)
LNDEP		-		-0.003*** (0.000)		-0.112*** (0.000)
INTDEP	+		6.052*** (0.000)		6.441*** (0.000)	
POL	+		1.194*** (0.000)		0.976*** (0.000)	
LG	+/-				0.070*** (0.0145)	
POL*LG	+				0.429*** (0.000)	
NPL (-1)	-	+	0.638*** (0.000)	-0.101*** (0.000)	0.386** (0.0167)	-0.099*** (0.000)
LATA (-1)	+	-	0.427*** (0.000)	0.001 (0.8470)	0.433*** (0.000)	0.047*** (0.000)
ROA (-1)	+	-		-0.027* (0.0856)		-0.037 (0.1443)
TEN	+	-	3.395*** (0.000)	0.022*** (0.000)	3.405*** (0.000)	0.374*** (0.000)
Loan Growth		+		0.0002 (0.3603)		0.0005 (0.2994)
LISTED		-		0.014*** (0.000)		0.085*** (0.000)
FOB	-		1.337*** (0.000)		1.362*** (0.000)	
Inflation	+/-		2.803*** (0.000)		-1.169** (0.0118)	
Cycle	+	?	-0.001 (0.2857)	-0.001 (0.8589)	-0.001 (0.5246)	-0.001* (0.0574)
T-BILL	-	+	-7.184*** (0.000)	0.697*** (0.000)	-7.272*** (0.000)	0.788*** (0.000)
HHI		-		0.160*** (0.0071)		-0.758*** (0.000)
Obs			2248	2248	2248	2248
Adj-R ²			0.94	0.31	0.94	0.22

Table 2. Regressions Results on the Full Sample (Equations 7 & 8)

This table presents the results of simultaneous equations. LNDEP is the natural log of deposits. INDEP is the ratio of interest expenses to deposits. SBPOL is the dummy variable for state-owned banks. PBPOL is the dummy variable for politically private banks. NPL, LATA, ROA, and TEN are proxies of credit risk, liquidity risk, profitability, and bank size, respectively. LISTED is the dummy variable for publicly traded banks. FOB is the dummy variable for foreign banks. INFLATION is the inflation rate, CYCLE is the cycle of GDP per capita, TBILL is the interest rate on 1 month Treasury bill, and HHI is the squares of the market shares (assets) of all banks. LG identifies the limited guarantee system, SBPOL*LG and PBPOL*LG are the interactions of LG and SBPOL, LG and PBPOL, respectively. The values in parentheses are p-values. Standard errors are corrected for heteroskedasticity following White's methodology. *, ** and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Expected Sign		Model			
	Supply eq.	Demand eq.	Supply (Dep. Variable: LNDEP)	Demand (Dep. Variable: INTDEP)	Supply	Demand
Constant			12.62*** (0.000)	0.046** (0.000)	12.64*** (0.000)	1.185** (0.000)
LNDEP		-		-0.003*** (0.000)		-0.084*** (0.000)
INTDEP	+		6.000*** (0.000)		5.349*** (0.000)	
SBPOL	+		1.700*** (0.000)		1.396*** (0.000)	
PBPOL	+		0.768*** (0.000)		0.672*** (0.000)	
LG	+/-				0.098*** (0.000)	
SBPOL*LG	+				0.564*** (0.000)	
PBPOL*LG	+				0.166*** (0.000)	
NPL (-1)	-	+	0.640*** (0.000)	-0.101*** (0.000)	0.196 (0.1689)	-0.099*** (0.000)
LATA (-1)	+	-	0.440*** (0.000)	0.001 (0.8490)	0.361*** (0.000)	0.035*** (0.000)
ROA (-1)	+	-		-0.026* (0.0996)		-0.035 (0.1416)
TEN	+	-	3.452*** (0.000)	0.022*** (0.000)	3.496*** (0.000)	0.285*** (0.000)
Loan Growth		+		0.0002 (0.3844)		0.0004 (0.3641)
LISTED		-		0.014*** (0.000)		0.066*** (0.000)
FOB	-		1.434 (0.000)		1.441*** (0.000)	

Table 2. (Continued)

	Expected Sign		Model			
	Supply eq.	Demand eq.	Supply (Dep. Variable: LNDEP)	Demand (Dep. Variable: INTDEP)	Supply	Demand
Inflation	+/-		2.804*** (0.000)		0.861** (0.0318)	
CYCLE	+		-0.001 (0.2835)	-0.001 (0.854)	-0.001 (0.4293)	-0.0001 (0.1278)
T-BILL	-	+	-7.156*** (0.000)	0.697*** (0.000)	-6.278*** (0.000)	0.764*** (0.000)
HHI		-		0.159*** (0.0078)		-0.525*** (0.000)
Observations			2248	2248	2248	2248
Adj-R ²			0.94	0.31	0.95	0.28

Table 3. Regressions Results on the Full Sample (Equations 9 & 10)

This table presents the results of simultaneous equations. LNDEP is the natural log of deposits. INDEP is the ratio of interest expenses to deposits. SBPOL is the dummy variable for state-owned banks. GOVOFF is the dummy variable for private banks with current/former government official in their board of commissioner. PAR is the dummy for private banks with politicians in their board of commissioner. DIR is the dummy for private banks with politically connected director. NPL, LATA, ROA, and LNTA are proxies of credit risk, liquidity risk, profitability, and bank size, respectively. LISTED is the dummy variable for publicly traded banks. FOB is the dummy variable for foreign banks. INFLATION is the inflation rate, CYCLE is the cycle of GDP per capita, TBILL is the interest rate on 1 month Treasury bill, and HHI is the squares of the market shares (assets) of all banks. LG is the dummy variable which identifies the limited guarantee system, SBPOL*LG and GOVOFF*LG, PAR*LG, and DIR*LG are the interactions between LG and SOB, GOVOFF, PAR, and DIR, respectively. The values in parentheses are p-values. Standard errors are corrected for heteroskedasticity following White's methodology. *, ** and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Expected Sign			Model			
	Supply eq.	Demand eq.	Supply (Dep. Variable: LNDEP)	Demand Dep. Variable: INTDEP)	Supply	Demand
Constant			12.55*** (0.000)	0.046** (0.000)	12.54*** (0.000)	0.978** (0.000)
LNDEP		-		-0.003*** (0.000)		-0.069*** (0.000)
INTDEP	+		6.000*** (0.000)		6.258*** (0.000)	
SBPOL	+		1.790*** (0.000)		1.515*** (0.000)	
GOVOFF	+		0.802*** (0.002)		0.694*** (0.000)	
PAR	+		0.743*** (0.000)		0.671*** (0.000)	
DIR	+		0.371*** (0.000)		0.582*** (0.000)	
LG	+/-				0.108*** (0.000)	
SBPOL*LG	+				0.562*** (0.000)	
GOVOFF*LG	+				0.195*** (0.000)	
PAR*LG	+				0.144*** (0.0026)	
DIR*LG	+				-0.407*** (0.000)	

Table 3. (Continued)

	Expected Sign		Model			
	Supply eq.	Demand eq.	Supply (Dep. Variable: LNDEP)	Demand Dep. Variable: INTDEP)	Supply	Demand
NPL (-1)	-	+	0.641*** (0.000)	-0.101*** (0.000)	0.304* (0.0509)	-0.099*** (0.000)
LATA (-1)	+	-	0.439*** (0.000)	0.001 (0.8497)	0.360*** (0.000)	0.029*** (0.000)
ROA (-1)	+	-		-0.026* (0.0993)		-0.032 (0.1257)
TEN	+	-	3.363*** (0.000)	0.023*** (0.000)	3.392*** (0.000)	0.237*** (0.000)
Loan Growth		+		0.0002 (0.3946)		0.0003 (0.3703)
LISTED		-		0.014*** (0.000)		0.056*** (0.000)
FOB	-		1.515 (0.000)		1.543*** (0.000)	
Inflation	+/-		2.803*** (0.000)		1.074** (0.0087)	
CYCLE	+	+	-0.001 (0.2839)	-0.0001 (0.8582)	-0.0001 (0.4891)	-0.0001 (0.1944)
T-BILL	-	+	-7.154*** (0.000)	0.697*** (0.000)	-7.012*** (0.000)	0.752*** (0.000)
HHI		-		0.159*** (0.0078)		-0.400*** (0.000)
Observations			2248	2248	2248	2248
Adj-R2			0.94	0.31	0.94	0.29

Overall, our results support the conjecture that the supply of funds is higher for politically connected banks. In table 1¹⁹, the POL variable, which identifies politically connected banks, has a positive and significant coefficient. This result is consistent with our hypothesis that politically connected banks benefit from a higher supply of funds than their non-politically connected counterparts. In table 2, our two measures of banks' political connections, the one for state-owned banks (SBPOL) and the one for politically connected private banks (PBPOL), also have a positive and significant impact on the supply of deposits. Furthermore, when we consider the detailed information on the nature

¹⁹ Cf. first set of equations.

of the political connections of private banks (GOVOFF, PAR and DIR) in table 3, we find that having former/current bureaucrats (GOVOFF), politicians – parliament or political party members – on the board of commissioners or as banks’ owners (PAR), and/or politically connected directors (DIR) makes it easier for banks to collect deposits. Therefore the results confirm our hypothesis that being politically connected can help banks attract deposits. Such politically connected banks are presumably perceived as less risky by depositors because their political connections might prevent them from failure. Another possible explanation is that the political figures on the board of these banks could take advantage of their political power to encourage government or state-owned enterprises to place their assets in the banks where they are commissioners.

We then examine the impact of a change in the deposit insurance system. We argue that the effect of political connections on the supply of funds might be stronger after the introduction of the limited guarantee (LG) system because in theory only a fraction of the deposits benefit from insurance. A larger added value of political connections during the LG system would indicate that the limited guarantee is credible in that depositors believe that banks might fail but still expect such specific institutions to benefit from public support. We use two methods to examine this hypothesis. Firstly, we include a dummy, named LG, which identifies the period covered by the limited guarantee system, and we interact it with the political connections variables (second set of equations in tables 1, 2 and 3). The dummy variable enables us to identify whether the supply of funds is affected by the deposit insurance regime in place (limited guarantee or blanket guarantee). The interaction variables enable us to determine if political connections matter as much (or less) during the LG period. Secondly, we split the time period of our study: we undertake the simultaneous equation estimations under each regime, BGS and LG²⁰ (tables 4, 5 and 6).

The coefficient of the dummy variable that identifies the explicit insurance system (LG) is significant and positive. Thus, overall, deposit supply is higher

²⁰ As for the dummy variable the LG period starts two quarters before the official start date, and the BGS period finished two quarters before the official end date, as we suppose depositors anticipate the law.

after the implementation of the limited guarantee system. This is consistent with the general view that an improvement in the quality of institutions and supervision will improve the overall confidence in the financial system. The coefficient of the interaction variables, $POL*LG$, is significant and positive. Thus political connections still matter after the implementation of formal deposit insurance, and furthermore banks that are politically connected are even able to attract more deposits under the limited guarantee regime. The coefficients of the interaction terms are significant and positive for both state-owned banks ($SBPOL*LG$) and private politically connected banks ($PBPOL*LG$). On the whole, the political connections of state-owned banks and private banks have a stronger impact on the supply of funds after the implementation of the limited guarantee system. Our results support the hypothesis that the added value of political connections is stronger during the LG period. Depositors might have been more sensitive to political connections since the end of the blanket guarantee scheme. A higher impact of banks' political connections during the LG system suggests that the explicit deposit insurance system with limited guarantee in Indonesia is credible. Depositors seem to believe that a bank might actually fail. Regulators have reached part of their goal with the adoption of an explicit insurance providing however more value to political connections because depositors seem to expect, to some extent, support for such banks. The coefficients of the other interaction variables show that the impact of connections through current/former government bureaucrats ($GOVOFF$) and through politicians on the board of commissioners or as banks' owners (PAR) on the supply of funds is higher during the limited guarantee system. Thus being politically connected through politicians is relevant for private banks during the blanket guarantee scheme, but is even more valuable under the LG period.

Table 4. Regression Results on Split Samples (Equations 5 & 6)

This table presents the results of simultaneous equations. LNDEP is the natural log of deposits. INDEP is the ratio of interest expenses to deposits. POL is the dummy variable for politically connected banks. NPL, LATA, ROA, and TEN are proxies of credit risk, liquidity risk, profitability, and bank size, respectively. LISTED is the dummy variable for publicly traded banks. FOB is the dummy variable for foreign banks. INFLATION is the inflation rate, CYCLE is the cycle of GDP per capita, TBILL is the interest rate on 1 month Treasury bill, and HHI is the squares of the market shares (assets) of all banks. LG identifies the limited guarantee system, POL*LG are the interactions of LG and POL. The values in parentheses are p-values. Standard errors are corrected for heteroskedasticity following White's methodology. *, ** and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Expected Sign		BGS		LG	
	Supply eq.	Demand eq.	Supply (Dep. Variable: LNDEP)	Demand (Dep. Variable: INTDEP)	Supply	Demand
Constant			13.20*** (0.000)	0.326*** (0.000)	12.69*** (0.000)	0.389*** (0.024)
LNDEP		-		-0.021*** (0.000)		-0.020*** (0.000)
INTDEP	+		-4.064 (0.777)		4.577 (0.3103)	
POL	+		0.582 (0.000)		1.106*** (0.000)	
NPL (-1)	-	+	2.507*** (0.002)	-0.046*** (0.0072)	-6.235*** (0.000)	-0.009 (0.8939)
LATA (-1)	+	-	0.326 (0.6346)	-0.030*** (0.000)	1.569*** (0.000)	-0.034*** (0.004)
ROA (-1)	+	-		-0.042* (0.096)		-0.044 (0.031)
TEN	+	-	3.827*** (0.000)	0.047*** (0.000)	3.754*** (0.000)	0.053*** (0.0002)
Loan Growth		+		0.0004 (0.2366)		-0.0005 (0.1987)
LISTED		-		0.001 (0.7536)		0.019** (0.0164)
FOB	-		1.335** (0.0281)		1.390*** (0.000)	
INFLATION	+/-		3.770 (0.6525)		0.457 (0.8265)	
CYCLE	+	?	0.0001 (0.870)	-0.0001 (0.1632)	-0.0007 (0.9328)	0.00008** (0.0436)
T-BILL	-	+	-0.008 (0.99)	0.855*** (0.113)	-5.056 (0.228)	0.653*** (0.000)
HHI		-		-0.276 (0.315)		-1.467 (0.7071)
Observations			1049	1049	1142	1142
Adj-R ²			0.46	0.10	0.43	0.10

Table 5. Regressions Results on Split Samples (Equations 7 & 8)

This table presents the results of simultaneous equations. LNDEP is the natural log of deposits. INDEP is the ratio of interest expenses to deposits. SBPOL is the dummy variable for state-owned banks. PBPOL is the dummy variable for politically private banks. NPL, LATA, ROA, and TEN are proxies of credit risk, liquidity risk, profitability, and bank size, respectively. LISTED is the dummy variable for publicly traded banks. FOB is the dummy variable for foreign banks. INFLATION is the inflation rate, CYCLE is the cycle of GDP per capita, TBILL is the interest rate on 1 month Treasury bill, and HHI is the squares of the market shares (assets) of all banks. LG identifies the limited guarantee system, SBPOL*LG and PBPOL*LG are the interactions of LG and SBPOL, LG and PBPOL, respectively. The values in parentheses are p-values. Standard errors are corrected for heteroskedasticity following White's methodology. *, ** and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Expected Sign		BGS		LG	
	Supply eq.	Demand eq.	Supply (Dep. Variable: LNDEP)	Demand (Dep. Variable: INTDEP)	Supply	Demand
Constant			14.39*** (0.000)	0.335*** (0.000)	13.62*** (0.000)	0.452*** (0.000)
LNDEP		-		-0.022*** (0.000)		-0.026*** (0.000)
INTDEP	+		-64** (0.0125)		-11.70 (0.0032)	
SBPOL	+		-0.396 (0.2852)		1.174*** (0.000)	
PBPOL	+		-0.027 (0.8212)		0.310*** (0.0013)	
NPL (-1)	-	+	-1.547 (0.2431)	-0.043*** (0.0102)	-4.995*** (0.0003)	0.003 (0.9574)
LATA (-1)	+	-	-1.959** (0.0325)	-0.031*** (0.000)	0.014 (0.9548)	-0.034*** (0.004)
ROA (-1)	+	-		0.007 (0.6755)		0.075 (0.2726)
TEN	+	-	6.667*** (0.000)	0.125*** (0.000)	-3.771*** (0.000)	0.102*** (0.000)
Loan Growth		+		0.0005 (0.83)		-0.0005 (0.5546)
LISTED		-		0.006 (0.1578)		-0.015** (0.0121)
FOB	-		-0.774 (0.4771)		1.030*** (0.000)	
INFLATION	+/-		28.73** (0.0305)		-1.482 (0.342)	
CYCLE	+	+	0.003** (0.046)	-0.0001 (0.1469)	-0.001 (0.1465)	0.0001*** (0.0262)
T-BILL	-	+	47.76** (0.0191)	0.863*** (0.000)	-6.635* (0.0889)	0.637*** (0.000)
HHI		-		-0.277*** (0.0087)		-0.008 (0.1904)
Observations			1049	1049	1142	1142
Adj-R ²			0.10	0.46	0.34	0.10

Table 6. Regressions Results on Split Samples (Equations 9 & 10)

This table presents the results of simultaneous equations. LNDEP is the natural log of deposits. INDEP is the ratio of interest expenses to deposits. SBPOL is the dummy variable for state-owned banks. GOVOFF is the dummy variable for private banks with current/former government official in their board of commissioner. PAR is the dummy for private banks with politicians in their board of commissioner. DIR is the dummy for private banks with politically connected director. NPL, LATA, ROA, and LNTA are proxies of credit risk, liquidity risk, profitability, and bank size, respectively. LISTED is the dummy variable for publicly traded banks. FOB is the dummy variable for foreign banks. INFLATION is the inflation rate, CYCLE is the cycle of GDP per capita, TBILL is the interest rate on 1 month Treasury bill, and HHI is the squares of the market shares (assets) of all banks. LG is the dummy variable which identifies the limited guarantee system, SBPOL*LG and GOVOFF*LG, PAR*LG, and DIR*LG are the interactions between LG and SOB, GOVOFF, PAR, and DIR, respectively. The values in parentheses are p-values. Standard errors are corrected for heteroskedasticity following White's methodology. *, ** and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Expected Sign		BGS		LG	
	Supply eq.	Demand eq.	Supply (Dep. Variable: LNDEP)	Demand (Dep. Variable: INTDEP)	Supply	Demand
Constant			14.15*** (0.000)	0.304*** (0.000)	13.57*** (0.000)	0.447*** (0.000)
LNDEP		-		-0.020*** (0.000)		-0.026*** (0.000)
INTDEP	+		-54.96** (0.0152)		-10.89*** (0.0055)	
SBPOL	+		-0.018 (0.9602)		1.261*** (0.000)	
GOVOFF	+		0.099 (0.3674)		0.291*** (0.029)	
PAR	+		-0.004 (0.9728)		0.361*** (0.0023)	
DIR	+		0.032 (0.7940)		0.326* (0.0994)	
NPL (-1)	-	+	-1.782 (0.1173)	-0.043*** (0.0087)	-4.804*** (0.0003)	-0.005 (0.9382)
LATA (-1)	+	-	-1.764** (0.0273)	-0.032*** (0.000)	-0.025 (0.9166)	-0.034** (0.064)
ROA (-1)	+	-		0.003 (0.8313)		0.076 (0.2751)
TEN	+	-	6.230*** (0.000)	0.120*** (0.000)	3.733*** (0.000)	0.100*** (0.000)
Loan Growth		+		0.0001 (0.8540)		-0.001 (0.5459)
LISTED		-		0.001 (0.7799)		-0.014** (0.0218)
FOB	-		-0.301 (0.7606)		1.097*** (0.000)	

Table 6. (Continued)

	Expected Sign		BGS		LG	
	Supply eq.	Demand eq.	Supply (Dep. Variable: LNDEP)	Demand (Dep. Variable: INTDEP)	Supply	Demand
INFLATION	+/-		25.07** (0.0335)		-1.490 (0.3417)	
CYCLE	+	+	0.003** (0.0499)	-0.00002 (0.1325)	-0.001 (0.1588)	0.0001** (0.0272)
T-BILL	-	+	40.74** (0.0234)	0.867*** (0.000)	6.047 (0.1151)	0.637*** (0.000)
HHI		-		-0.276** (0.02)		-1.029** (0.0439)
Observations			1049	1049	1142	1142
Adj-R ²			0.52	0.13	0.37	0.11

Results for split samples are reported in table 4 (POL), table 5 (SBPOL and PBPOL) and table 6 (SBPOL, GOVOFF, PAR, DIR). The coefficient for politically connected banks (POL) is higher during the LG period than during the BGS period, corroborating that depositors have been more sensitive to political connections since the end of the blanket guarantee scheme.

Considering state-owned banks (SBPOL) and politically private banks (PBPOL), we find a positive and significant coefficient for banks' political connections during the limited guarantee system, while the coefficient is not significant during the blanket guarantee scheme. These results confirm our previous findings. Political connections are more valuable under the LG system. Using the detailed measures of politically private banks, we find that banks with at least one of their controlling shareholders or commissioners connected through current/former government bureaucrats (GOVOFF), with shareholders or commissioners connected to politicians (PAR) or with directors connected to politicians (DIR) are able to attract more deposits during the limited guarantee system. Overall, all our findings corroborate our previous results.

1.4.2 Robustness Checks²¹

We conduct several robustness checks. First, instead of estimating the structural model (equations 5 and 6, equations 7 and 8, and equations 9 and 10), we estimate the reduced form with panel data similarly to other studies on the deposit market (Park *et al.*, 1995; Martinez-Peria and Schmukler, 2001; Murata and Hori, 2006; Onder and Ozyildirim, 2008; Hori *et al.*, 2009; Karas *et al.*, 2010). We include the same four bank fundamental variables, banks' political connections, foreign banks, listed banks, banks' loan growth rate, macroeconomic variables, the deposit insurance variable and interaction terms between political connections and the deposit insurance system. The results are consistent with those of the simultaneous equations model. Specifically, we find that political connections are significant for all politically connected banks, either state-owned or private. This result also holds when we consider the different kinds of connections, (GOVOFF, PAR and DIR). We also find that, overall, political connections play a stronger role during the limited guarantee system.

Second, we estimate the same structural model by neutralizing the two quarters prior to the actual implementation of the limited guarantee system (Q2:2005 and Q3:2005) to more accurately differentiate the two regimes. Our findings are unaltered.

Third, we use the first difference of the natural logarithm of the deposit variable ($LNDEP_t - LNDEP_{t-1}$) as a proxy of the supply of funds to replace the natural logarithm of deposits (LNDEP). We undertake estimations on both the structural model and the reduced form. Some bank specific variables turn out not to be significant. However we obtain consistent results with regard to the impact of our variables of interest on the supply of funds (political connection variables and their interaction with the deposit insurance system).

Fourth, although the global financial crisis triggered in 2008 did not affect South East Asia as promptly and as severely as it did western countries in its early stage, we run our estimations by ignoring the year 2008 to ensure that our results

²¹Not all the results are not reported but they are available on request.

are not, to some extent, driven by depositors' loss of confidence in the banking system. The results are still the same.

1.5 Conclusion

We examine the impact of banks' political connections on the deposit market before and after the implementation of formal deposit insurance in Indonesia. For this purpose, we use quarterly individual data for 109 banks from 2002 to 2008 to estimate a simultaneous equations panel data model. Specifically, we start by investigating whether politically connected banks are able to attract more deposits than their non-politically connected counterparts. We then examine whether banks' political connections have a different impact during the blanket guarantee regime, implemented after the Asian financial crisis of 1997/98 (in which deposits were fully insured) and the limited guarantee system introduced in 2005.

We find evidence that the supply of funds is higher for politically connected banks compared to their non-politically connected counterparts. Being a state-owned bank or a politically-connected private bank has a strong positive effect on the supply of funds. Going deeper into different forms of political connections shows that having current/former bureaucrats, politicians, parliament or political party members on the board of commissioners or as banks' owners, and politically connected directors plays a significant role to attract deposits. Thus, our study highlights the forms of political connections that are important in attracting deposits.

We also find that the impact of political connections on the supply of funds is stronger after the removal of the guarantee regime. This result holds for state-owned and private banks, in particular for those hiring current/former bureaucrats and politicians. Political connections have helped to attract even greater deposits since the implementation of explicit deposit insurance with limited guarantee. Presumably, the implementation of explicit insurance with limited coverage is perceived as credible in excluding uninsured creditors from the guarantee. Depositors might be fear that badly managed and/or risky banks could actually

fail but they also seem to believe that political connections can be of value in case of distress (selected capital injections, priority bail-out...). Hence, regulators might have succeeded in reforming the deposit insurance system by introducing a credible threat on insured creditors. This in turn might have improved market discipline and lowered moral hazard incentives. But our findings indicate that the side effect of such a change in the regulatory environment is the higher value attributed to political connections. The introduction of formal deposit insurance and stronger market discipline might have exacerbated the issue of political connections in the banking sector.

APPENDIX**Appendix A. Measures and Sources of Variables****Table A1. Measures and Sources of Variables**

Variables	Measures	Sources
Deposits LNDEP	Natural logarithm of deposits	Calculated from data in the banks' financial statement
Interest Rate on Deposits INTDEP	Ratio of interest expenses to deposits	Calculated from data in the banks' financial statement
Political Connections POL SBPOL PBPOL GOVOFF PAR DIR	Dummy; 1 = banks with a political connection, 0 = otherwise Dummy (State-owned Bank); 1 = State-owned Banks, 0 = otherwise Dummy (Politically private bank); 1 = Connected private banks, 0 = otherwise Dummy (Private bank with current/former government official in its board of commissioner); 1 = with current/former government official, 0 = otherwise Dummy (Private bank with politician in its board of commissioner); 1 = with politician, 0 = otherwise Dummy (Private bank with Connected Director); 1 = with politically connected director, 0 = otherwise	Classification of Bank Indonesia - Name of commissioners, directors and shareholders of banks from banks' quarterly financial statements - Biography of commissioners and directors as well as shareholders of banks from banks' annual reports, OneSource database, the directory data of Indonesian Banks Association and internet. - Name of commissioners, directors and shareholders of banks from banks' quarterly financial statements - Biography of commissioners and directors as well as shareholders of banks from banks' annual reports, OneSource database, the directory data of Indonesian Banks Association and internet.

Table A1. (Continued)

Credit Risk NPL	Ratio of non-performing loans to total loans	Calculated by the Bank Indonesia
Liquidity Risk LATA	Ratio of liquid assets to total assets	Calculated from data in the financial statement
Profitability ROA	Ratio of net income to total assets	Calculated by Bank Indonesia
Bank Size TEN	Dummy; 1 = if the bank is one of the 10 largest bank in Indonesia, 0 = otherwise	Calculated from data in the banks' financial statement
Listed Banks LISTED	Dummy (1 = Publicly traded banks, 0 = otherwise)	Indonesia Stock Exchange (IDX)
Foreign Banks FOB	Dummy (1 = Foreign banks and Joint venture banks, 0 = otherwise)	Classification of Bank Indonesia
Macroeconomics Variables Cycle GDP Per Capita (CYCLE)	Cycle GDP per capita (filtered by using Hodrick-Prescott Filter)	Indonesia Statistics Bureau (BPS)
T-BILL	1 month Treasury Bill rate	Bank Indonesia
Inflation	Inflation rate (quarterly data)	Bank Indonesia
Market Structure HHI	HHI (Herfindahl-Hirschman Index-Squares of the market shares (assets) of all banks)	Authors' calculation
Deposit Insurance System with Limited Guarantee LG	Dummy (1 = period of limited guarantee, 0 = period of blanket guarantee scheme)	Mc.Leod (2005); Hadad <i>et al.</i> (2011)
Interaction Variables POL*LG	Interaction between POL and LG	Authors' calculation
SBPOL*LG	Interaction between SBPOL and LG	Authors' calculation
PBPOL*LG	Interaction between PBPOL and LG	Authors' calculation
GOVOFF*LG	Interaction between GOVOFF and LG	Authors' calculation
PAR*LG	Interaction between PAR and LG	Authors' calculation
DIR*LG	Interaction between DIR and LG	Authors' calculation

Appendix B. Simultaneous Equations Panel Data with Dummy Variables

Consider the structural model (eq. 3 and 4) that can be written by using the following equations:

$$Q_{i,t} = \alpha_i + \alpha_t + \beta X_{i,t-1} + \eta_2 Z_i + \mu_2 W_t + \lambda P_{i,t} + \varepsilon_{i,t} \dots \dots \dots (9)$$

$$P_{i,t} = \alpha'_i + \alpha'_t + \beta' X'_{i,t-1} + \eta'_2 Z'_i + \mu'_2 W'_t + \lambda' Q'_{i,t} + \varepsilon'_{i,t} \dots \dots \dots (10)$$

where $Q_{i,t}$ = quantity of deposits of bank i at time t

$P_{i,t}$ = interest rate of bank i at time t

α_i = individual fixed effect

α_t = time fixed effect

$X_{i,t-1}$ = vector of explanatory variables which contains individual and time varying variables from bank i at time $t-1$

Z_i = vector of explanatory variables which contains only individual varying variables for bank i

W_t = vector of explanatory variables which contains only time varying variables at time t

Following Plumper and Troeger (2007) methodology, we start by considering system 1 below. We only include regressors which contain individual and time varying (X), our main variables ($Q_{i,t}$ and $P_{i,t}$), individual fixed effects (α_i) and time fixed effects (α_t).

System 1

$$Q_{i,t} = \alpha_i + \alpha_t + \beta X_{i,t-1} + \lambda P_{i,t} + \varepsilon_{i,t} \dots \dots \dots (11)$$

$$P_{i,t} = \alpha'_i + \alpha'_t + \beta' X'_{i,t-1} + \lambda' Q'_{i,t} + \varepsilon'_{i,t} \dots \dots \dots (12)$$

From those regressions, we obtain the fitted value of the individual effect ($\hat{\alpha}_i$ and $\hat{\alpha}_i$) as well as the fitted value of the time effect ($\hat{\alpha}_t$ and $\hat{\alpha}'_t$). We then conduct regressions of the fitted value on individual-varying (Z_i) and time-varying variables (W_t).

$$\hat{\alpha}_i = \eta_1 + \eta_2 Z_i + \zeta_i \dots \dots \dots (13)$$

$$\hat{\alpha}_t = \mu_1 + \mu_2 W_t + \varphi_t \dots \dots \dots (14)$$

$$\hat{\alpha}'_i = \eta'_1 + \eta'_2 Z'_i + \zeta'_i \dots \dots \dots (15)$$

$$\hat{\alpha}'_t = \mu'_1 + \mu'_2 W'_t + \varphi'_t \dots \dots \dots (16)$$

We obtain unexplained terms (residuals) from those regressions (ζ and φ). Finally, we examine the complete model in system 2 by including such residuals.

System 2

$$Q_{i,t} = \alpha + \beta X_{i,t-1} + \gamma Z_i + \delta W_t + \lambda P_{i,t} + \tau \hat{\zeta}_i + \theta \hat{\varphi}_t + \varepsilon_{i,t} \dots \dots \dots (17)$$

$$P_{i,t} = \alpha' + \beta' X'_{i,t-1} + \gamma' Z'_i + \delta' W'_t + \lambda' Q_{i,t} + \tau \hat{\zeta}'_i + \theta \hat{\varphi}'_t + \varepsilon_{i,t} \dots \dots \dots (18)$$

Appendix C. Descriptive Statistics

Table C1. Number of Banks Based on Their Political Connections

This table presents the statistics on whether Indonesian commercial banks are politically connected and what kind of connections. NON POL is the non-politically connected private banks. SBPOL is the state-owned banks. PBPOL is the politically private banks. GOVOFF is the private banks with current/former government official in their board of commissioner. PAR is private banks with politicians in their board of commissioner. DIR is the private banks with politically connected director.

	Number of Banks						
	2002	2003	2004	2005	2006	2007	2008*
SBPOL**	30	30	30	30	30	30	30
PBPOL**	31	33	32	33	34	34	31
- GOVOFF	23	25	25	26	25	26	23
- PAR	12	12	11	11	12	12	10
- DIR	3	3	3	3	3	3	3
NON PBPOL	48	46	47	46	45	45	48
TOTAL BANKS	109	109	109	109	109	109	109

* = until the first quarter; ** POL = SBPOL + PBPOL

Table C2. Descriptive Statistics

This table presents the descriptive statistics of the variables. LNDEP is the natural log of deposits. INDEP is the ratio of interest expenses to deposits. NPL is the ratio of non-performing loans to total loans, LATA is the ratio of liquid assets to total assets, ROA is return on assets, and Loan Growth is the bank's rate of loan growth. INFLATION is the inflation rate, CYCLE is the cycle of Indonesian GDP per capita, TBILL is the interest rate on 1 month treasury bill, and HHI is the Herfindahl-Hirschman Index.

	Obs.	Mean	Median	Maximum	Minimum	Std. Dev.
LNDEP	2248	14.3382	14.1861	19.1690	8.7777	1.8306
INTDEP	2248	0.0466	0.0374	0.5593	0.0014	0.0375
NPL (-1)	2248	0.0487	0.0312	0.6219	0.0001	0.0647
LATA (-1)	2248	0.4049	0.3920	0.9871	0.0535	0.1903
ROA (-1)	2248	0.0280	0.0264	0.4600	-1.5299	0.0427
Loan Growth	2248	0.1476	0.0518	93.547	-0.0988	2.1141
INFLATION	2248	0.0208	0.0197	0.0997	0.0017	0.0192
CYCLE	2248	-1.1414	-14.858	197.639	-171.451	79.027
TBILL	2248	0.0989	0.0889	0.1574	0.0733	0.0234
HHI	2248	0.0879	0.0823	0.1365	0.0657	0.0211

Appendix D. Correlation Matrix

Table D1. Correlation Matrix

This table presents the correlation matrix of the variables. LNDEP is the natural log of deposits. INDEP is the ratio of interest expenses to deposits. NPL is the ratio of non-performing loans to total loans, LATA is the ratio of liquid assets to total assets, ROA is the return on assets, and Loan Growth is the bank's rate of loan growth. INFLATION is the inflation rate, CYCLE is the cycle of GDP per capita, TBILL is the interest rate on 1 month treasury bill, and HHI is the Herfindahl-Hirschman Index.

	LNDEP	INTDEP	NPL (-1)	LATA (-1)	ROA (-1)	Loan Growth	INFLATION	CYCLE	TBILL	HHI
LNDEP	1									
INTDEP	-0.0826	1								
NPL (-1)	-0.0030	0.0555	1							
LATA (-1)	0.1282	-0.1160	0.0530	1						
ROA (-1)	0.0565	-0.0833	-0.1154	0.0733	1					
Loan Growth	0.0258	0.0345	-0.0186	0.0243	-0.0060	1				
INFLATION	0.0182	0.1635	-0.0604	-0.0643	-0.0054	-0.0125	1			
CYCLE	-0.0322	-0.1103	0.0324	0.0175	-0.0071	-0.0046	-0.0130	1		
TBILL	-0.0606	0.2472	0.1856	0.0865	-0.0315	0.0322	0.0954	0.2156	1	
HHI	-0.1604	0.2001	0.2532	0.1396	-0.0027	0.0414	-0.1659	0.0691	0.4137	1

Appendix E. Regression Results of Reduced Form with Panel Data
Table E1. Regression Results of Reduced Form with Panel Data on Full and Split Samples – Dependent Variable: LNDEP

This table presents the regression results of reduced form. The dependent variable is LNDEP which is the natural log of deposits. POL is the dummy variable for politically connected banks. NPL, LATA, ROA, and TEN are proxies of credit risk, liquidity risk, profitability, and bank size, respectively. FOB is the dummy variable for foreign banks. INFLATION is the inflation rate, CYCLE is the cycle of GDP per capita, and TBILL is the interest rate on 1 month Treasury bill. LG identifies the limited guarantee system, POL*LG are the interactions of LG and POL. The values in parentheses are p-values. Standard errors are corrected for heteroskedasticity following White's methodology. *, ** and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Expected Sign	Full sample (without interaction)	Full sample (with interaction)	BGS	LG
Constant		12.984*** (0.000)	13.011*** (0.000)	13.026*** (0.000)	12.9*** (0.00)
POL	+	0.977*** (0.000)	0.832*** (0.000)	0.86*** (0.000)	1.01*** (0.000)
LG	+/-		0.104* (0.064)		
POL*LG	+		0.276*** (0.000)		
NPL (-1)	-	-3.048*** (0.000)	-2.685*** (0.000)	-1.868*** (0.002)	-6.448*** (0.000)
LATA (-1)	+	0.773*** (0.000)	0.804*** (0.000)	0.406*** (0.0008)	1.303*** (0.000)
ROA (-1)	+	0.043 (0.972)	0.265 (0.848)	0.213 (0.894)	-0.167 (0.867)
TEN	+	3.578*** (0.000)	3.566*** (0.000)	3.526*** (0.000)	3.754*** (0.000)
FOB	-	1.327*** (0.000)	1.292*** (0.000)	1.255*** (0.000)	1.301*** (0.000)
INFLATION	+/-	1.545 (0.108)	-0.357 0.146	2.676** (0.021)	-0.48 (0.236)
CYCLE	+	-0.00004 (0.886)	-0.0001* (0.09)	0.00003 (0.86)	-0.0002 (0.609)
T-BILL	-	-3.006*** (0.016)	-3.533*** (0.000)	-3.254*** (0.000)	-1.602 (0.201)
Obs		2248	2248	1082	1166
Adj-R ²		0.454	0.457	0.454	0.458

Table E2. Regression Results of Reduced Form with Panel Data on Full and Split Samples – Dependent Variable: LNDEP

This table presents the regression results of reduced form. The dependent variable is LNDEP which is the natural log of deposits. SBPOL is the dummy variable for state-owned banks. PBPOL is the dummy variable for politically private banks. NPL, LATA, ROA, and TEN are proxies of credit risk, liquidity risk, profitability, and bank size, respectively. FOB is the dummy variable for foreign banks. INFLATION is the inflation rate, CYCLE is the cycle of GDP per capita, and TBILL is the interest rate on 1 month Treasury bill. LG identifies the limited guarantee system, SBPOL*LG and PBPOL*LG are the interactions of LG and SBPOL, LG and PBPOL, respectively. The values in parentheses are p-values. Standard errors are corrected for heteroskedasticity following White's methodology. *, ** and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Expected Sign	Full sample (without interaction)	Full sample (with interaction)	BGS	LG
Constant		13.223*** (0.000)	13.633*** (0.000)	13.186*** (0.000)	13.439*** (0.000)
SBPOL	+	1.457*** (0.000)	1.355*** (0.000)	1.219*** (0.000)	1.699*** (0.000)
PBPOL	+	0.564*** (0.000)	0.395*** (0.000)	0.566*** 0.000	0.511*** (0.000)
LG	+/-		0.338*** (0.000)		
SBPOL*LG	+		0.423*** (0.002)		
PBPOL*LG	+		0.136 (0.209)		
NPL (-1)	-	-2.836*** (0.000)	-7.918*** (0.000)	-1.657*** (0.003)	-7.91*** (0.000)
LATA (-1)	+	-0.041 (0.709)	0.008 (0.96)	-0.117 (0.379)	0.067 (0.675)
ROA (-1)	+	0.947 (0.183)	-3.886*** (0.005)	-0.229 (0.854)	-4.147*** (0.003)
TEN	+	3.674*** (0.000)	3.934*** (0.000)	3.594*** (0.000)	3.935*** (0.000)
FOB	-	1.402*** (0.000)	1.489*** (0.000)	1.295*** (0.000)	1.491*** (0.000)
Inflation	+/-	0.591*** (0.436)	-1.591*** (0.000)	2.373*** (0.002)	-1.034** (0.026)
CYCLE	+	-0.0003 (0.344)	0.00007 (0.769)	0.00004 0.696	-0.0002 (0.573)
T-BILL	-	-2.261* (0.072)	-3.159 (0.000)	-2.94 (0.000)	-1.564 (0.258)
Observations		2248	2248	1082	1166
Adj-R ²		0.478	0.501	0.470	0.501

Table E3. Regression Results of Reduced Form with Panel Data on Full and Split Samples – Dependent Variable: LNDEP

This table presents the regression results of reduced form. The dependent variable is LNDEP which is the natural log of deposits. SBPOL is the dummy variable for state-owned banks. GOVOFF is the dummy variable for private banks with current/former government official in their board of commissioner. PAR is the dummy for private banks with politicians in their board of commissioner. DIR is the dummy for private banks with politically connected director. NPL, LATA, ROA, and LNTA are proxies of credit risk, liquidity risk, profitability, and bank size, respectively. FOB is the dummy variable for foreign banks. FOB is the dummy variable for foreign banks. INFLATION is the inflation rate, CYCLE is the cycle of GDP per capita, and TBILL is the interest rate on 1 month Treasury bill. LG is the dummy variable which identifies the limited guarantee system, SBPOL*LG and GOVOFF*LG, PAR*LG, and DIR*LG are the interactions between LG and SOB, GOVOFF, PAR, and DIR, respectively. The values in parentheses are p-values. Standard errors are corrected for heteroskedasticity following White's methodology. *, ** and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Expected Sign	Full sample (without interaction)	Full sample (with interaction)	BGS	LG
Constant		13.403*** (0.000)	13.556*** (0.000)	13.043*** (0.000)	13.403*** (0.000)
SBPOL	+	1.765*** (0.000)	1.465*** (0.000)	1.361*** (0.000)	1.764*** (0.000)
GOVOFF	+	0.493*** (0.000)	0.575*** (0.000)	0.779*** (0.000)	0.493*** (0.000)
PAR	+	0.526*** (0.000)	0.311*** (0.000)	0.499*** (0.000)	0.526*** (0.000)
DIR	+	0.36*** (0.000)	0.294*** (0.000)	0.284*** (0.000)	0.36*** (0.000)
LG	+/-		0.401*** (0.000)		
SBPOL*LG	+		0.374*** (0.004)		
GOVOFF*LG	+		-0.098 (0.401)		
PAR*LG	+		0.258*** (0.0002)		
DIR*LG	+		0.077 (0.328)		
NPL (-1)	-	-7.521*** (0.000)	-7.524*** (0.000)	-1.597*** (0.005)	-7.522*** (0.000)
LATA (-1)	+	0.004 (0.983)	-0.054 (0.745)	-0.078 (0.565)	0.004 (0.983)
ROA (-1)	+	-4.175*** (0.004)	-4.014*** (0.005)	0.437 (0.706)	-4.175*** (0.004)
TEN	+	3.866*** (0.000)	3.863*** (0.000)	3.484*** (0.000)	3.866*** (0.000)
FOB	-	1.539*** (0.000)	1.539*** (0.000)	1.41*** (0.000)	1.539*** (0.000)

Table E.3. (Continued)

	Expected Sign	Full sample (without interaction)	Full sample (with interaction)	BGS	LG
Inflation	+/-	-1.067** (0.026)	-1.638*** (0.000)	2.271*** 0.008	-1.067** (0.026)
CYCLE	+	-0.0002 (0.565)	0.00007 (0.769)	0.00004 (0.688)	-0.0003 (0.564)
T-BILL	-	-1.580 (0.263)	-3.213*** (0.000)	-2.883*** (0.000)	-1.58 (0.262)
Observations		2248	2248	1082	1166
Adj-R2		0.508	0.508	0.488	0.508

Appendix F. Regression Results of Reduced Form with Panel Data

Table F1. Regression Results of Reduced Form with Panel Data on Full and Split Samples – Dependent Variable: The first difference of the natural logarithm of the deposit variable ($LNDEP_t - LNDEP_{t-1}$)

This table presents the regression results of reduced form. The dependent variable is the first difference of the natural logarithm of the deposit variable ($LNDEP_t - LNDEP_{t-1}$). POL is the dummy variable for politically connected banks. NPL, LATA, ROA, and TEN are proxies of credit risk, liquidity risk, profitability, and bank size, respectively. FOB is the dummy variable for foreign banks. INFLATION is the inflation rate, CYCLE is the cycle of GDP per capita, and TBILL is the interest rate on 1 month Treasury bill. LG identifies the limited guarantee system, POL*LG are the interactions of LG and POL. The values in parentheses are p-values. Standard errors are corrected for heteroskedasticity following White's methodology. *, ** and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Expected Sign	Full sample (without interaction)	Full sample (with interaction)	BGS	LG
Constant		0.03 (0.169)	0.04 (0.075)	0.013 (0.629)	0.011 (0.807)
POL	+	0.024*** (0.004)	0.009 (0.361)	0.007 (0.57)	0.042*** (0.000)
LG	+/-		-0.021 (0.217)		
POL*LG	+		0.034* (0.06)		
NPL (-1)	-	-0.093 (0.118)	-0.106 (0.113)	-0.031 (0.566)	-0.202 (0.327)
LATA (-1)	+	-0.024 (0.414)	-0.025 (0.378)	-0.033 (0.193)	-0.011 (0.836)
ROA (-1)	+	0.052 (0.399)	0.06 (0.352)	0.049 (0.38)	0.015 (0.789)
TEN	+	-0.003 (0.849)	0.002 (0.901)	-0.012 (0.582)	(0.998)
FOB	-	0.005 (0.797)	0.005 (0.796)	-0.005 (0.839)	0.013 (0.633)
Inflation	+/-	-1.103*** (0.000)	-1.102*** (0.000)	0.263 (0.75)	-1.259*** (0.000)
Cycle	+	0.00002 (0.677)	0.00001 (0.695)	0.0002** (0.025)	-0.000008 (0.962)
T-BILL	-	0.132 (0.36)	0.134 (0.311)	0.154 (0.164)	0.276 (0.461)
Obs		2248	2248	1082	1166
Adj-R ²		0.016	0.018	0.006	0.026

Table F2. Regression Results of Reduced Form with Panel Data on Full and Split Samples – Dependent Variable: The first difference of the natural logarithm of the deposit variable (LNDEP_t– LNDEP_{t-1})

This table presents the regression results of reduced form. The dependent variable is the first difference of the natural logarithm of the deposit variable (LNDEP_t– LNDEP_{t-1}). SBPOL is the dummy variable for state-owned banks. PBPOL is the dummy variable for politically private banks. NPL, LATA, ROA, and TEN are proxies of credit risk, liquidity risk, profitability, and bank size, respectively. FOB is the dummy variable for foreign banks. INFLATION is the inflation rate, CYCLE is the cycle of GDP per capita, and TBILL is the interest rate on 1 month Treasury bill. LG identifies the limited guarantee system, SBPOL*LG and PBPOL*LG are the interactions of LG and SBPOL, LG and PBPOL, respectively. The values in parentheses are p-values. Standard errors are corrected for heteroskedasticity following White’s methodology. *, ** and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Expected Sign	Full sample (without interaction)	Full sample (with interaction)	BGS	LG
Constant		0.035* (0.081)	0.045* (0.033)	0.014 (0.616)	0.037 (0.423)
SBPOL	+	0.033* (0.074)	0.015 (0.334)	0.009 (0.637)	0.055* (0.079)
PBPOL	+	0.017* (0.053)	0.005 (0.57)	0.005 (0.608)	0.026* (0.089)
LG	+/-		-0.021 (0.217)		
SBPOL*LG	+		0.042 (0.244)		
PBPOL*LG	+		0.026 (0.263)		
NPL (-1)	-	-0.091 (0.126)	-0.108 (0.114)	-0.029 (0.565)	-0.348* (0.09)
LATA (-1)	+	-0.038 (0.136)	-0.041 (0.109)	-0.036 (0.153)	-0.042 (0.405)
ROA (-1)	+	0.033 (0.582)	0.042 (0.52)	0.046 (0.444)	0.048 (0.846)
TEN	+	-0.002 (0.924)	-0.000005 (0.999)	-0.011 (0.581)	0.017 (0.575)
FOB	-	0.007 (0.735)	0.007 (0.725)	-0.005 (0.847)	0.015 (0.617)
Inflation	+/-	-1.113*** (0.000)	-1.111*** (0.000)	0.262 (0.752)	-1.18*** (0.000)
CYCLE	+	0.00002 (0.678)	0.00001 (0.699)	0.0002 (0.025)	0.00005 (0.743)
T-BILL	-	0.139 (0.338)	0.146 (0.298)	0.156 (0.155)	0.162 (0.686)
Observations		2248	2248	1082	1166
Adj-R ²		0.017	0.018	0.005	0.027

Table F3. Regression Results of Reduced Form with Panel Data on Full and Split Samples – Dependent Variable: The first difference of the natural logarithm of the deposit variable (LNDEP_t– LNDEP_{t-1})

This table presents the regression results of reduced form. The dependent variable is the first difference of the natural logarithm of the deposit variable (LNDEP_t– LNDEP_{t-1}). SBPOL is the dummy variable for state-owned banks. GOVOFF is the dummy variable for private banks with current/former government official in their board of commissioner. PAR is the dummy for private banks with politicians in their board of commissioner. DIR is the dummy for private banks with politically connected director. NPL, LATA, ROA, and LNTA are proxies of credit risk, liquidity risk, profitability, and bank size, respectively. FOB is the dummy variable for foreign banks. INFLATION is the inflation rate, CYCLE is the cycle of GDP per capita, and TBILL is the interest rate on 1 month Treasury bill. LG is the dummy variable which identifies the limited guarantee system, SBPOL*LG and GOVOFF*LG, PAR*LG, and DIR*LG are the interactions between LG and SOB, GOVOFF, PAR, and DIR, respectively. The values in parentheses are p-values. Standard errors are corrected for heteroskedasticity following White's methodology. *, ** and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Expected Sign	Full sample (without interaction)	Full sample (with interaction)	BGS	LG
Constant		0.036* (0.074)	0.046** (0.027)	0.014 (0.596)	0.04 (0.387)
SBPOL	+	0.032* (0.09)	0.015 (0.326)	0.008 (0.651)	0.055* (0.094)
GOVOFF	+	0.021*** (0.003)	0.018 (0.108)	0.011 (0.184)	0.029** (0.021)
PAR	+	0.007 (0.396)	0.0005 (0.962)	0.002 (0.812)	0.009 (0.501)
DIR	+	-0.031** (0.021)	-0.047*** (0.000)	-0.044*** (0.0002)	-0.02 (0.395)
LG	+/-		-0.02 (0.239)		
SBPOL*LG	+		0.041 (0.267)		
GOVOFF*LG	+		0.019 (0.349)		
PAR*LG	+		0.016 (0.475)		
DIR*LG	+		0.036 (0.165)		
NPL (-1)	-	-0.089 (0.143)	-0.107 (0.126)	-0.028 (0.587)	-0.347 (0.089)
LATA (-1)	+	-0.041 (0.125)	-0.043 (0.098)	-0.038 (0.146)	-0.046 (0.367)
ROA (-1)	+	0.037 (0.557)	0.046 (0.49)	0.053 (0.415)	0.041 (0.867)

Table F.3. (Continued)

	Expected Sign	Full sample (without interaction)	Full sample (with interaction)	BGS	LG
TEN	+	-0.002 (0.916)	-0.0004 (0.984)	-0.01 (0.627)	0.015 (0.617)
FOB	-	0.006 (0.774)	0.006 (0.762)	-0.006 (0.82)	0.014 (0.641)
Inflation	+/-	-1.114*** (0.000)	-1.114*** (0.000)	0.277 (0.737)	-1.184*** (0.000)
CYCLE	+	0.00002 (0.671)	0.00001 (0.685)	0.0002 (0.023)	-0.00005 (0.742)
T-BILL	-	0.141 (0.334)	0.149 (0.29)	0.158 (0.145)	0.163 (0.685)
Observations		2248	2248	1082	1166
Adj-R2		0.017	0.017	0.006	0.026

CHAPTER 2

DETERMINANTS OF BANK INTEREST MARGIN: WHAT MATTERS FOR INDONESIAN BANKS?²²

²² This chapter is based on a paper entitled “Why Have Bank Interest Margins Been so High in Indonesia since the 1997/1998 Financial Crisis?” co-authored with Agusman and Amine Tarazi.

2.1 Introduction

Indonesian banks' average net interest margin, the difference between interest income and expenses divided by interest-earning assets, is widely understood to be higher than margins in other countries, particularly in East Asia (Rosengard and Prasetyantoko, 2011). A number of cross-country studies point out this fact. Demirgüç-Kunt and Huizinga (1998) show the average margins of Indonesian banks from 1988 to 1995 were 3.6%, higher than those of neighboring countries such as Singapore (2.2%) and Malaysia (2.7%). Using data from 1999 to 2008, following the 1997/1998 financial crisis, López-Espinosa *et al.* (2011) find average bank interest margins in Indonesia (4.85%) were much higher than, for example, the average interest margins of Japanese banks (1.92%). Recently, Lin *et al.* (2012) indicate Indonesian banks' average margin of 6.36% between 1997 and 2005 was the highest of the Asian countries in their sample²³. Their work also shows the interest margin of Indonesian banks is significantly higher after the 1997/1998 crisis than before²⁴.

This paper extends the literature on the determinants of net interest margins by studying Indonesian banks that have experienced a problem of persistently high net interest margins since the 1997/1998 financial crisis. We hypothesize the persistence of high interest margins in Indonesia is affected by a set of simultaneous factors: the structure of loan portfolios, the degree of competition, the level of income diversification, cost efficiency, bank size, credit risk, and liquidity risk. We also assume net interest margins are influenced by bank ownership characteristics. To our knowledge, this paper is the first to comprehensively study the determinants of net interest margins in Indonesia after the crisis. We incorporate two unique loan portfolio components, small scale loans and property loans, as contextually-important factors explaining interest margins. Studying interest margins with regard to the ownership and governance characteristics of banks is also important. Using pooled regression techniques as well as static and dynamic panel regressions, we find evidence that the structure

²³ We conduct our own computations using data from BankScope for banks in 9 East Asia countries from 2005 to 2009. The average margin of Indonesian banks is 5.7%, far above the 3.03% average for the 8 other countries.

²⁴ López-Espinosa *et al.* (2011) also show that average interest margins of Indonesian banks have increased over their sample period.

of loan portfolios does help determine interest margins. Specifically, small scale loans contribute to increased bank margins, whereas housing (property) loans tend to reduce interest margins. Also, operating costs, market power, risk aversion and liquidity risk all significantly and positively affect margins, while credit risk and cost to income ratio are negatively associated with margins. Our results also corroborate the loss leader hypothesis on cross-subsidization of lending and non-interest activities. Furthermore, state-owned banks have higher margins than other banks, while foreign banks and large banks set lower margins.

The remainder of this paper is organized as follows: Section 2.2 reviews previous work on related issues. In Section 2.3, we provide some background on Indonesian banking. In Section 2.4, we describe our data, variables, and empirical model. Section 2.5 reports the results and robustness checks. Section 2.6 concludes our findings and provides policy implications.

2.2 Literature Review

As financial intermediary institutions, banks collect deposits from surplus spending units with an interest cost and distribute them to deficit spending units while charging an interest rate. Although high interest margins are associated with inefficiency (Drakos, 2003; Beck and Hesse, 2009; López-Espinosa *et al.*, 2011), some studies use interest margins as a measure of bank profitability (*e.g.* Chen and Liao, 2011). The issue of how banks set their interest margins has been extensively studied in the literature. In a seminal paper, Ho and Saunders (1981) introduce the dealership model in which banks perform as risk-averse intermediaries between the demanders and suppliers of funds. Their model posits that positive interest margins will prevail as long as banks are risk-averse agents and face uncertainty, even in a highly competitive market. They conclude that a bank's interest margin is determined by four factors: the degree of managerial risk aversion, the size of transactions, market structure, and the variance of the market interest rate. Many empirical studies have expanded and examined the dealership model using cross-country data, or by focusing on a single country in the context of developed and developing countries (*e.g.* Angbazo, 1997; Saunders and Schumacher, 2000; Maudos and de Guevara, 2004; Carbó and Rodriguez, 2007;

Hawtrey and Liang, 2008; Maudos and Solís, 2009; Poghosyan, 2010; Fungáčová and Poghosyan, 2011; Lin *et al.*, 2012). The literature has also provided theoretical microeconomic approaches to optimal interest margin setting (Allen, 1988; Angbazo, 1997; Maudos and de Guevara, 2004; Maudos and Solís, 2009). Beck and Hesse (2009) offer another comprehensive study on the determinants of interest margins, enlightening four major perspectives on the factors that determine interest margins and spread: i) the risk-based view concerns compensation for the riskiness of loans, ii) the small financial system focuses on the fixed cost component of financial service provision and the resulting scale economies, iii) market structure matters for competitiveness and ownership structure of the banking market, and iv) the macroeconomic view reveals spreads and margins are affected by monetary and exchange rate policies as well as economic cycles.

From a risk-based perspective, and in line with previous studies, Beck and Hesse (2009) argue higher risk in bank lending positively affects margins. Under this view, banks charge a higher risk premium for riskier loans. Subsequently, the level of risk compensation may depend on the structure of the loan portfolio. More specifically, in the case of a developing country such as Uganda, Beck and Hesse (2009) find sectoral loan portfolio composition of banks influences the variation of margins²⁵. In the present paper, we consider two types of lending that may significantly determine interest margins. First, as in other developing countries, bank lending to small medium enterprises (SMEs) is prevalent in Indonesian banks, especially in domestic banks. Loans to SMEs may require a higher risk premium because SMEs are more financially constrained than large firms, and SMEs are relatively opaque (de la Torre *et al.*, 2010) due to weaker or non-existent accounting standards (Behr *et al.*, 2011). Moreover, lending to these firms is typically costly in the context of Indonesia (Agung *et al.*, 2001). Second, we consider whether the proportion of housing (property) loans affects the setting of interest margins. As a large market, Indonesia has been undergoing consumption-driven economic growth. One driver is the growth of housing demand (Hoek-Smit, 2005), which subsequently escalates the demand for housing

²⁵ Using data regarding Ugandan banking, they include a number of sectors: agriculture, mining, manufacturing, trade, transportation, construction, and other services.

loans. This type of lending is considered less risky because banks hold a certificate of ownership, which increases in value under normal conditions, as collateral for each loan. Moreover, the policy of the Government of Indonesia to widen access to housing finance for the poor necessitates banks charge a lower rate.

Ho and Saunders (1981) argue banks facing relatively inelastic demand and supply functions can exercise their monopoly power to set a greater margin. A number of empirical studies have examined how market structure and competitive conditions in banking impact interest margins²⁶. Maudos and de Guevara (2004) find a positive effect of bank market power, estimated by the Lerner index, on interest margins in European Union banking sectors. Claeys and Vennet (2008) find a higher interest margin is associated with a higher concentration of the banking industry in Central and Eastern European countries. Using data from Mexican banks, Maudos and Solís (2009) find banks with greater market power, measured by a Lerner index, have higher interest margins. Following the studies of Maudos and de Guevara (2004) and Maudos and Solís (2009), we use the Lerner index to represent the degree of competition. Banks with greater market power typically set higher interest margins²⁷.

Banks around the world have diversified their revenue sources. Deregulation and technological changes have triggered the development of non-interest activities and reduced the importance of traditional intermediation activities (Lepetit *et al.*, 2008; Elsas *et al.*, 2010). Lepetit *et al.* (2008) test the loss leader hypothesis, which contends the link between diversification in bank activities and interest margins could be negative. This is because banks might charge a lower lending rate to attract new customers and build long-term relationships, enabling the sale of services and higher gains from non-interest income activities. They empirically test this hypothesis in the context of European banks. Similarly, Maudos and Solís (2009) find diversified banks, i.e. those with a

²⁶ The Herfindahl Hirschman Index (HHI) and the Lerner index are the two widely used methods to measure market structure and its impact on bank. These two measures do not, however necessarily reflect the same dimension. HHI measures the concentration of the industry; the Lerner index reflects the degree of competition, as it measures the ability of a bank to influence the price of products, and is therefore directly linked to competition (Weill, 2011).

²⁷ We report results obtained with HHI instead of the Lerner index in the robustness check section.

higher degree of non-interest income, have lower interest margins. Although income diversification is also widespread in Indonesian banks, dependence on traditional banking activities is still prevalent²⁸.

We also take into account efficiency in the production process, bank size, risk aversion, credit risk, and liquidity risk to explain the persistence of high interest margins in Indonesia. We follow the studies of Maudos and de Guevara (2004), Beck and Hesse (2009), Maudos and Solís (2009), and Fungáčová and Poghosyan (2011), and include operating (overhead) costs in the determination of interest margins. Maudos and de Guevara (2004) extend the dealership model by including operating costs to represent how efficient banks are in their production process. The higher the ratio of operating costs to total assets, the higher the interest margins banks set. The other proxy of efficiency is the cost to income ratio, which Maudos and Solís (2009) argue also measures the quality of bank management, as this ratio reflects a spent cost for a selected asset. They find this ratio has a negative effect on interest margins. Bank size is also included. Some empirical studies find large banks have lower margins because these banks may reach economies of scale that enable them to decrease their margins (Fungáčová and Poghosyan, 2011), and they tend to grow in loan markets with low margins (Lopez-Espinosa *et al.*, 2011). Beck and Hesse (2009) also argue smaller banks may encounter higher costs and therefore set higher margins. We incorporate the ratio of equity to total assets, which is considered representative of the degree of bank risk aversion (Maudos and Solís, 2009; Poghosyan, 2010). In the dealership model, Ho and Saunders (1981) explain higher managerial risk aversion will increase interest margins. We follow a number of previous studies that include credit risk as a determinant of interest margins. There are two competing arguments regarding the effect of credit risk on bank margins. On one hand, banks facing higher credit risk will charge a higher risk premium on the loans they grant (Angbazo, 1997; Maudos and de Guevara, 2004; López-Espinosa *et al.*, 2011). On the other, Fungáčová and Poghosyan (2011) argue risky banks could be punished by depositors in the form of a higher interest rate required on deposits; implying margins should be lower for these banks. We also consider liquidity risk's ability

²⁸ In this paper, we show that the average diversification index is only 0.16 indicating that Indonesian banks, as a whole, are less diversified than those in other countries.

to influence margins. López-Espinosa *et al.* (2011) contend the higher opportunity cost of holding reserves as a result of higher liquid assets would decrease net interest margins. Similar results are also found in other studies (Maudos and de Guevara, 2004; Chen and Liao, 2011).

We also examine whether bank interest margins differ across ownership types. First, we consider the interest margins of state-owned (government) banks. The role of state-owned banks in a banking system has been studied from several perspectives, particularly in the context of developing countries in which bank behaviors matter more (Micco *et al.*, 2007). According to social or development theory of public enterprises, these banks are often inefficient because they act as development agencies and are sometimes assigned to fund unprofitable government projects. Additionally, labor surplus could be a form of policy burden borne by these banks to help government reduce unemployment. Such development roles may make banks more costly and in turn lead to higher interest margins. Implicit guarantees and too-big-to-fail considerations might also create differences in margin setting between state-owned and private banks. Depositors may perceive state-owned banks as less risky because they believe that the government will rescue those banks from financial problems, creating the perception of a larger implicit guarantee (Mondschean and Opiela, 1999). Moreover, given that state-owned banks in Indonesia are mostly large banks, the too-big-to-fail dimension should also be considered. These two factors could lead such banks to charge a lower rate on deposits, which ultimately could spread their margins.

Second, we examine whether the interest margins of foreign banks are different from those of other banks. It is generally argued foreign banks in emerging countries positively impact the host country through resource allocation and higher efficiency (Claessens *et al.*, 2001). Having better hard information and technology may lead these banks to perform more efficiently than domestic banks.

Few studies examine the role of ownership in the determination of interest margins²⁹. Contrary to common expectation, Drakos (2003), using data regarding

²⁹ Poghosyan (2010) argues that no theoretical paper has incorporated the role of ownership in the determination of interest margins. Moreover, he denotes that any potential impact of ownership,

banks in Central and Eastern European Countries (CEECs) and the Former Soviet Union countries (FSU), finds state-owned banks typically set lower margins. Martinez-Peria and Mody (2004) show foreign banks in five Latin American Countries charge lower interest margins than domestic banks. Poghosyan (2010), by considering the dealership approach, finds foreign bank participation does not affect interest margins in Central and Eastern European countries. Fungáčová and Poghosyan (2011) find the impact of some interest margin determinants in Russia differs across state banks, domestic private banks and foreign banks. Though the results of previous studies on this issue are inconclusive, the unique feature of the Indonesian banking structure requires consideration in our investigation on the determinants of interest margins.

2.3 Indonesian Banking Post-Financial Crisis

The 1997/1998 financial crisis created severe consequences regarding the intermediation function of Indonesian banks. Shortly after the crisis, the Indonesian banking system experienced a credit crunch phenomenon in which banks were reluctant to grant new loans³⁰. This credit crunch led to a sharp decrease in intermediation, as shown by a lower ratio of loans to deposits. Banks then charged a strangling interest rate on loans to cover their intermediation costs. The credit crunch was considered the cause of Indonesia's slower economic recovery compared to other crisis-hit Asian countries, such as South Korea and Thailand (Agung *et al.*, 2001). Given banks' importance to the financial system³¹, the Government of Indonesia implemented several policies that relied on them to accelerate the economic recovery. The government, for example, bolstered banks

particularly foreign banks versus domestic banks, has already been accounted for in the dealership model and its extension.

³⁰ The banks' reluctance to grant loans was considered the result of excessive bank lending behavior during the banking deregulation regime that amplified the impact of the financial crisis. Therefore, banks then behaved very carefully in their lending activities. In the aftermath of the crisis, other affected countries in the region, such as Malaysia, Thailand, South Korea, and the Philippines, also faced the credit crunch problem (Ding *et al.*, 1998). Bank credit in Indonesia continued to grow slowly due to banks being confronted with higher credit risk, capital crunch, and a lack of information regarding the quality of borrowers (Agung *et al.*, 2001). In 2001, the average loan to deposit ratio of banks included in our sample was only 54% (more details are provided in our descriptive statistics' Tables 1 and 2).

³¹ The capital market and other financial intermediation institutions were still relatively underdeveloped.

to improve their intermediation activities. Despite these improvements, high interest margins continue to be a serious problem in Indonesia. Regulators have implemented a number of regulations to promote healthy competition, improve market discipline, and boost good governance, all designed to decrease interest margins and subsequently improve the efficiency of financial intermediation. Moreover, Bank Indonesia recently released a direct regulation on prime lending rate transparency for commercial banks. This regulation is intended to promote the transparency of banking products, including their benefits, costs and risks. At the primary stage, this regulation is addressed to those with assets greater than 10 trillion Rupiah.

As in other developing countries, micro, small, and medium enterprises (MSMEs) were an important issue in Indonesia.³² MSMEs' significant economic contributions impact work force and output, both of which are high government priorities. They also better responded to the harmful 1997/1998 economic crisis (Hill, 2001; Hayashi, 2002), even though they faced several problems, such as lack of access to capital markets and technology, that made them less competitive (Najib *et al.*, 2011). In recognition of their economic importance, the government encouraged banks to increase MSMEs' access to financing³³. In 2001, Bank Indonesia issued a regulation (PBI No: 3/2/PBI/2001) on small scale loans, which recommended banks channel small scale loans in their lending portfolio³⁴. The implementation plan of the Indonesian Banking Architecture (IBA) also highlighted improving credit and financing access to MSMEs³⁵.

The Indonesian economy experienced consistent growth following the economic recovery, driven largely by consumption. Escalating housing demand in

³² The Indonesia Statistics Bureau released data demonstrating that 99.99 % of business units 2007 were micro, small, and medium enterprises and they accounted for 97.3 % of the total workforce in Indonesia (Statistics of Micro, Small and Medium Enterprises 2007-2008).

³³ Agung *et al.* (2001) reveal lending to SMEs in Indonesia was relatively low risk. Banks, however, were still reluctant to release loans to SMEs because loans to these firms were very costly, and because banks lacked experience in dealing with SMEs. Wattanapruttipaisan (2003) explains the factors causing unsuccessful SME financing following the financial crisis in ASEAN countries, including Indonesia, came from demand and supply sides. On the supply side, banks were reluctant to channel loans to SMEs, even though they could charge a high risk premium, because having SMEs as the major debtors appears risky.

³⁴ This regulation defined a small scale loan as bank lending to borrowers for investment and/or working capital (productive purposes) up to 500 million Rupiah.

³⁵ In 2004, the government introduced the Indonesian Banking Architecture (IBA), a road map of the Indonesian banking sector which would be implemented gradually.

line with population growth was a primary driver of economic growth. Hoek-Smit (2005) points out the demand for new housing in Indonesia is more than 800,000 units per year (3.5-3.75%), which caused growth in housing (mortgage) loans to exceed growth in other types of credit. As one of several poverty alleviation programs, the government announced a policy to ease access to housing loans for the poor and thus reduce the number of homeless people. The Ministry of Public Housing implemented the policy, issuing a regulation to subsidize housing loans for the poor through lower-fixed interest rates.

The Indonesian banking is comprised of a number of state-owned banks that are distinguished by which government controls them. Regional development banks are owned by regional (provincial and district) governments, while state-owned banks are controlled by the central government³⁶. As public enterprises, these banks are subject to government policies. However, they also benefit from funding in the form of deposits, particularly from small depositors. In response to the intermediation cost, these banks could either charge a lower rate for deposits, or the inefficiency of these banks could increase overhead costs. Interest margins of state-owned banks could therefore be higher than those of other banks. Foreign banks' participation in the bank ownership structure creates another issue.³⁷ In principle, foreign banks' presence should benefit the domestic market since they have better technology that could improve efficiency and therefore lower the cost of intermediation.

2.4 Data, Variables, and Empirical Model

This study investigates the factors behind the persistence of high interest margins in Indonesian banking following the 1997/1998 financial crisis. We hypothesize several factors help explain the interest margins of Indonesian banks. These are the structure of loan portfolios, degree of competition, level of income diversification, cost efficiency, bank size, risk aversion, credit risk, liquidity risk, and ownership structure.

³⁶ Four state-owned banks in our sample are publicly traded banks. The government, however, maintains majority ownership.

³⁷ Hamada (2003) shows that foreign banks' presence in Indonesia started in 1968. However, the number of foreign banks was stable until the deregulation of the Indonesian banking sector in 1988, and doubled thereafter.

2.4.1 Data and Sample

We use yearly bank-level data for the 2001–2009 period. Banks' annual financial reports (balance sheets and income statements) come from Bank Indonesia and Ekofin Konsultindo. Data on the proportion of small scale loans and the proportion of property loans are reported by banks in the additional information of their financial reports. Our sample covers 93 commercial banks resulting in 617 bank-year observations. We end up with an unbalanced panel because we exclude banks exhibiting negative equity value, banks for which we have incomplete data for some variables, and a number of outliers³⁸.

2.4.2 Variables

2.4.2.1 Dependent Variable

- *Net Interest Margins*

The dependent variable of this study is the net interest margin (NIM), which is the difference between interest income and interest expenses divided by interest-earning assets.

2.4.2.2 Independent Variables

- *Loan Portfolio*

We use two kinds of lending shares: the proportion of small scale loans to total loans (SMALL) and the proportion of property (housing) loans to total loans (PROPERTY). A positive sign is expected for the small scale loans because these loans are costly and may require a higher risk premium. The coefficient of property loans is expected to be negative as these loans are less risky. Moreover, government policy could reduce the interest rate on these loans.

- *Market Power (Degree of Competition)*

We use a Lerner index (LERNER) to measure the degree of competition, as banks with a higher spread between price and marginal cost could be seen as having greater monopoly power. Banks with greater market power are supposed

³⁸ We need to eliminate banks with a negative value of equity in the computation of the Lerner index. For some variables, especially the non-performing loans ratio, we have some missing data. Finally, we ignore extreme observations (outliers) for all variables, particularly for our dependent variable (net interest margins), which excludes around 5% of bank-year observations.

to set higher interest margins (Maudos and de Guevara, 2004; Maudos and Solís, 2009). Referring to Koetter *et al.* (2012), LERNER is the difference between average revenues (AR) and marginal costs (MC) divided by average revenues (AR), which can be written as follows:

$$\text{LERNER} = (\text{AR} - \text{MC})/\text{AR} \dots\dots\dots (1)$$

To calculate marginal costs, we employ a translog total cost function that includes three input factors (interest on total borrowed funds, labor cost, and cost of fixed assets), four outputs (loans, other earnings assets, total securities, and off-balance sheet items), total equity, and time trend. The total cost function is estimated using a stochastic frontier analysis (SFA) following the work of Koetter *et al.* (2012).

A positive sign for the coefficient is expected, as banks with greater market power can set a higher interest margin. In addition to LERNER, we report the results obtained by considering the Herfindahl Hirschman Index (HHI) as a robustness check.

- *Diversification*

We follow the method of Elsas *et al.* (2010) to measure the degree of bank diversification (DIV). Their diversification index is essentially an adjusted Herfindahl-Hirschman index. The index ranges from 0 (fully specialized bank) to 0.75 (bank with fully balanced revenue). The diversification index is defined as:

$$\text{DIV} = [1 - [(\text{INT}/\text{REV})^2 + (\text{COM}/\text{REV})^2 + (\text{TRAD}/\text{REV})^2 + (\text{OTHER}/\text{REV})^2]] \times 100 \dots\dots\dots (2)$$

where INT is the gross interest income, COM is the commission income, TRAD represents the trading revenue, and OTHER is other revenue. The denominator is total revenues (REV).

As argued above, we expect a negative sign for the coefficient of this variable because more-diversified banks tend to set a lower interest rate (cross subsidization strategy).

- *Efficiency*

First, following the studies of Maudos and de Guevara (2004), Beck and Hesse (2009) and Maudos and Solís (2009), we include the ratio of operating costs to total assets (OVERHEAD) to represent the efficiency of the production process. The higher the operating costs, the higher the interest margin banks will charge. Second, following Maudos and Solís (2009), the ratio of cost to gross income (CIR) is employed to measure the efficiency (quality) of management. This ratio reflects how much management spends to obtain a unit of income; therefore, a negative sign is expected for this ratio.

- *Bank Size*

Bank size is measured, following Barry *et al.* (2011), by the natural logarithm of total assets orthogonalized with equity (ORTHOLNTA) due to of their strong correlation. Large banks are expected to set a lower bank margin because economies of scale enable them to decrease their margins (Fungáčová and Poghosyan, 2011). Such banks have been found to grow in loan markets with low margins (López-Espinosa *et al.*, 2011).

- *Risk Aversion*

The ratio of equity to total assets (EQTA) measures the degree of risk aversion, as proposed by Maudos and Solís (2009) and Poghosyan (2010). A higher degree of risk aversion is expected to be associated with a higher interest margin set by the bank.

- *Credit Risk*

We measure credit risk using the ratio of non-performing loans to total loans (NPL) as per Fungáčová and Poghosyan (2011). There are two competing arguments regarding the relationship between credit risk and margins. On one hand, banks facing higher credit risk might charge a higher risk premium on their loans (Maudos and de Guevara, 2004), thereby increasing interest margins. On the other, Fungáčová and Poghosyan (2011) argue depositors might require higher interest rates on their deposits because they feel the bank is more risky, thus lowering interest margins. Hence, the expected sign for credit risk is ambiguous.

- *Liquidity Risk*

The ratio of loans to deposits represents bank liquidity risk (LDR). The higher this ratio, the higher the liquidity risk and the lower the reserves a bank holds. As argued by López-Espinosa *et al.* (2011), a higher level of liquid assets would decrease net interest margins. We therefore expect a positive sign for the coefficient of LDR.

- *State-owned Banks*

As explained above, state-owned banks in Indonesia consist of central government-owned banks and regional development banks. We use a dummy variable (SOB) to identify the state-owned banks. These banks are expected to charge a lower rate for deposits because depositors perceive them as less risky. Moreover, the development roles of these banks may lead them to be more costly. A positive sign is therefore expected.

- *Foreign Banks*

Foreign banks (FOB) in Indonesia consist of branches of foreign banks, subsidiaries of foreign banks, and joint venture banks (Hadad *et al.*, 2011). We use a dummy variable (FOB) to categorize foreign banks. The benefits of better hard information and technology may lead these banks to perform more efficiently than domestic banks. Accordingly, a negative sign is expected.

2.4.2.3 Control Variables

- *Listed Banks*

Publicly traded banks are believed to have better monitoring and efficiency. Therefore, we incorporate a dummy variable for listed banks (LISTED) as a control variable.

- *Year Dummies*

We include year dummies (YEARS) in all of our regressions to capture the time effects Beck and Hesse (2009) argue could result from time-variant macroeconomic factors.

2.4.3 Empirical Model

To deal with multicollinearity issues, we orthogonalize the proxy of size, which is the natural log of total assets with equity. Moreover, because our bank diversification variable is highly correlated with both bank size and the variable capturing small scale loans, we do not introduce the diversification variable concomitantly to these two variables. We similarly do not introduce bank size concurrently with operating costs and the cost to income ratio due to their high correlation.

The specifications of the determinants of interest margins to be estimated are formulated as follows:

$$NIM_{i,t} = \alpha_0 + \alpha_1 SMALL_{i,t} + \alpha_2 PROPERTY_{i,t} + \alpha_3 LERNER_{i,t} + \alpha_4 OVERHEAD_{i,t} + \alpha_5 CIR_{i,t} + \alpha_6 EQTA_{i,t} + \alpha_7 NPL_{i,t} + \alpha_8 LDR_{i,t} + \alpha_9 SOB_i + \alpha_{10} FOB_i + \alpha_{11} LISTED_{i,t} + YEARS + \varepsilon_{i,t} \dots\dots\dots (3)$$

$$NIM_{i,t} = \alpha_0 + \alpha_1 SMALL_{i,t} + \alpha_2 PROPERTY_{i,t} + \alpha_3 LERNER_{i,t} + \alpha_4 ORTHOLNTA_{i,t} + \alpha_5 EQTA_{i,t} + \alpha_6 NPL_{i,t} + \alpha_7 LDR_{i,t} + \alpha_8 SOB_i + \alpha_9 FOB_i + \alpha_{10} LISTED_{i,t} + YEARS + \varepsilon_{i,t} \dots\dots\dots (4)$$

$$NIM_{i,t} = \alpha_0 + \alpha_1 PROPERTY_{i,t} + \alpha_2 LERNER_{i,t} + \alpha_3 DIV_{i,t} + \alpha_4 OVERHEAD_{i,t} + \alpha_5 CIR_{i,t} + \alpha_6 EQTA_{i,t} + \alpha_7 NPL_{i,t} + \alpha_8 LDR_{i,t} + \alpha_9 SOB_i + \alpha_{10} FOB_i + \alpha_{11} LISTED_{i,t} + YEARS + \varepsilon_{i,t} \dots\dots\dots (5)$$

where i and t represent bank and time, respectively. NIM is the net interest margin. SMALL is the proportion of small scale loans to total loans, and PROPERTY is the proportion of property (housing) loans to total loans. LERNER is the Lerner index. DIV is the bank diversification index. OVERHEAD is the ratio of operating costs to total assets, while CIR denotes the cost to income ratio. ORTHOLNTA is the natural logarithm of total assets orthogonalized with equity. EQTA is the ratio of equity to total assets. NPL is the ratio of non-performing loans to total loans. LDR stands for the loans to deposits ratio. SOB is a dummy variable that takes a value of 1 for state-owned banks. FOB is a dummy taking value 1 for foreign-banks. LISTED is a dummy taking value 1 for publicly traded banks. YEARS represents a vector of year (time) dummies. We estimate the empirical model in equation 3 using pooled and static panel regressions.

Carbó and Rodriguez (2007) and Maudos and Solís (2009) consider bank interest margins to be influenced by their previous values, given banks must match across periods the deposits and lending which are randomly determined as well as non-interest activities. They therefore argue the determination of interest margins should also be tested using a dynamic panel method. Hence, we also estimate a dynamic panel data model employing a two-step Generalized Method of Moments (GMM) estimator³⁹. The equations can be written as follows:

$$NIM_{i,t} = \alpha_0 + \alpha_1 NIM_{i,t-1} + \alpha_2 SMALL_{i,t} + \alpha_3 PROPERTY_{i,t} + \alpha_4 LERNER_{i,t} + \alpha_5 OVERHEAD_{i,t} + \alpha_6 CIR_{i,t} + \alpha_7 EQTA_{i,t} + \alpha_8 NPL_{i,t} + \alpha_9 LDR_{i,t} + \alpha_{10} SOB_i + \alpha_{11} FOB_i + \alpha_{12} LISTED_{i,t} + YEARS + \varepsilon_{i,t} \dots \dots \dots (6)$$

$$NIM_{i,t} = \alpha_0 + \alpha_1 NIM_{i,t-1} + \alpha_2 SMALL_{i,t} + \alpha_3 PROPERTY_{i,t} + \alpha_4 LERNER_{i,t} + \alpha_5 ORTHOLNTA_{i,t} + \alpha_6 EQTA_{i,t} + \alpha_7 NPL_{i,t} + \alpha_8 LDR_{i,t} + \alpha_9 SOB_i + \alpha_{10} FOB_i + \alpha_{11} LISTED_{i,t} + YEARS + \varepsilon_i \dots \dots \dots (7)$$

$$NIM_{i,t} = \alpha_0 + \alpha_1 NIM_{i,t-1} + \alpha_2 PROPERTY_{i,t} + \alpha_3 LERNER_{i,t} + \alpha_4 DIV_{i,t} + \alpha_5 OVERHEAD_{i,t} + \alpha_6 CIR_{i,t} + \alpha_7 EQTA_{i,t} + \alpha_8 NPL_{i,t} + \alpha_9 LDR_{i,t} + \alpha_{10} SOB_i + \alpha_{11} FOB_i + \alpha_{12} LISTED_{i,t} + YEARS + \varepsilon_{i,t} \dots \dots \dots (8)$$

2.5 Results

2.5.1 Descriptive Statistics

Table 1 presents the descriptive statistics for the variables of our full sample and the sub-samples by ownership type (state-owned banks, foreign banks, and private-domestic banks), while Table 2 reports the statistics year by year. The dependent variable (NIM) has a mean (median) of 6.61% (5.91%). As shown in Table 2, the yearly average interest margins of Indonesian banks are persistently high during the period we study. The means (medians) of the proportion of small scale loans and the proportion of property loans are 16.33% (7.78%) and 4.98% (0.77%), respectively. The mean (median) of Lerner index is 0.393 (0.369), while the average (median) of the diversification index is 16.61% (11.51%). The ratio of overhead costs to total assets has an average (median) of 3.73% (3.61%), while

³⁹ We use a two-step GMM estimator, namely the System GMM proposed by Arellano and Bover (1995) and Blundell and Bond (1998) which extends the standard GMM of Arellano and Bond (1991). The System GMM estimator uses both first-differences and levels.

the cost to income ratio has a mean (median) of 79.48% (80.25%). The average size in total assets is 20,593.86 billion Rupiah. The smallest bank has assets of 52.65 billion Rupiah, while the largest bank maintains assets of 370,000 billion Rupiah. The average (median) of the ratio of equity to total assets is 11.76% (9.73%). The mean (median) of the ratio of non-performing loans to total loans is 4% (2.8%). The average (median) of the loans to deposits ratio in our sample is 74.18% (69.78%).

Table 1: Descriptive Statistics – Based on Ownership Type

This table presents the descriptive statistics of our variables. NIM is the net interest margins (%). SMALL is the proportion of small scale loans to total loans (%). PROPERTY is the proportion of property loans to total loans (%). LERNER is the Lerner index. DIV is the diversification index (%). OVERHEAD is the ratio of operating costs to total assets (%). CIR is the cost to income ratio (%). ASSET denotes total assets in billion Rupiah. EQTA is the ratio of equity to total assets (%). NPL is the ratio of non-performing loans to total loans (%). LDR represents the loans to deposits ratio (%).

Sample	Banks	Statistics	NIM	SMALL	PROPERTY	LERNER	DIV	OVERHEAD	CIR	ASSETS (billion Rupiah)	EQTA	NPL	LDR
Full Sample	617	Mean	6.693	16.697	5.037	0.391	16.068	3.700	79.205	21003.25	11.760	3.999	74.181
		Median	5.980	8.030	0.786	0.366	11.301	3.616	80.144	4070.27	9.729	2.800	69.781
		Maximum	16.640	100.000	53.610	2.208	57.349	16.729	219.940	370000	51.069	44.000	313.446
		Minimum	-0.650	0.000	0.000	-7.930	0.864	0.195	21.850	52.65	0.466	0.010	5.104
		Std. Dev.	3.046	22.039	8.722	0.507	12.609	1.668	18.846	49010.14	7.348	4.519	38.775
		Skewness	0.828	1.971	2.771	-7.020	1.324	1.319	1.710	4.08189	1.940	3.443	2.133
State-owned Banks	207	Mean	9.109	31.901	4.568	0.535	10.299	4.265	76.575	32029.3	9.077	3.165	60.772
		Median	9.230	21.370	0.328	0.547	8.392	4.403	76.570	4566.6	8.656	2.010	56.458
		Maximum	16.640	100.000	53.610	0.995	31.043	7.589	108.290	370000	19.274	26.660	129.593
		Minimum	0.900	0.000	0.000	-0.075	2.573	0.958	38.920	208.62	3.133	0.090	10.037
		Std. Dev.	3.097	27.435	10.700	0.260	5.973	1.456	9.561	71330.99	3.137	3.433	25.996
		Skewness	0.095	1.091	3.302	-0.140	1.347	-0.091	-0.370	2.836817	0.833	3.189	0.341
Foreign Banks	127	Mean	4.741	0.302	1.129	0.484	33.237	2.711	65.700	10907.23	15.216	5.948	111.844
		Median	4.390	0.000	0.000	0.507	35.386	2.509	63.620	5509.92	14.520	4.090	98.983
		Maximum	10.000	13.000	19.765	1.991	57.349	8.537	219.000	52329.46	40.872	44.000	313.446
		Minimum	1.470	0.000	0.000	-0.997	6.865	0.195	21.850	410.01	0.466	0.100	22.466
		Std. Dev.	1.653	1.462	3.046	0.468	13.682	1.507	24.910	11548.69	9.013	6.132	57.073
		Skewness	0.824	6.582	4.058	-0.435	-0.250	0.862	2.318	1.546831	0.211	2.766	1.365
Private Domestic Banks	283	Mean	5.802	12.933	7.134	0.243	12.583	3.730	87.190	17468.99	12.170	3.735	67.087
		Median	5.570	7.310	4.869	0.187	10.124	3.529	86.930	2403.2	9.866	2.750	68.753
		Maximum	15.100	81.130	41.081	2.208	43.298	16.729	219.940	281000	51.069	29.020	152.650
		Minimum	-0.650	0.010	0.000	-7.930	0.864	1.012	34.450	52.65	1.301	0.010	5.104
		Std. Dev.	2.291	14.328	8.181	0.611	8.259	1.683	16.752	36370.19	7.976	4.113	22.667
		Skewness	0.957	2.167	1.422	-8.159	1.118	2.662	3.180	3.953469	2.350	3.597	-0.128

Table 2: Descriptive Statistics Year by Year

This table presents the descriptive statistics of our variables. NIM is the net interest margins (%). SMALL is the proportion of small scale loans to total loans (%). PROPERTY is the proportion of property loans to total loans (%). LERNER is the Lerner index. DIV is the diversification index (%). OVERHEAD is the ratio of operating costs to total assets (%). CIR is the cost to income ratio (%). ASSET denotes total assets in billion Rupiah. EQTA is the ratio of equity to total assets (%). NPL is the ratio of non-performing loans to total loans (%). LDR represents the loans to deposits ratio (%).

Year	Banks	Statistics	NIM	SMALL	PROPERTY	LERNER	DIV	OVERHEAD	CIR	ASSETS (billion Rupiah)	EQTA	NPL	LDR
2001	59	Mean	6.617	28.156	2.308	0.322	12.699	3.178	82.269	14721.88	9.432	6.749	54.147
		Std. Dev.	3.500	31.972	4.669	1.160	11.133	1.365	26.150	40384.47	7.061	8.110	31.037
2002	62	Mean	6.626	21.776	2.993	0.488	14.619	3.675	82.543	14935.41	11.186	5.475	64.823
		Std. Dev.	3.461	25.206	5.846	0.375	12.450	1.700	26.432	38919.5	7.076	6.136	38.392
2003	67	Mean	6.600	21.824	3.823	0.394	16.328	3.633	78.626	15064.21	11.647	4.375	67.826
		Std. Dev.	3.127	25.373	7.322	0.428	14.029	1.737	19.116	38450.43	6.892	4.720	37.177
2004	70	Mean	7.040	17.664	4.954	0.476	19.945	3.826	75.402	16146.19	11.253	4.095	73.471
		Std. Dev.	3.541	20.592	8.916	0.353	15.554	2.247	22.221	38578.98	5.738	4.181	40.784
2005	76	Mean	6.931	14.949	4.983	0.392	15.929	3.889	78.967	17700.96	11.485	3.977	77.036
		Std. Dev.	3.217	19.566	8.979	0.445	11.980	1.543	16.369	39669.33	7.210	3.782	39.823
2006	73	Mean	6.801	13.384	5.993	0.386	14.341	3.805	79.703	20858.44	11.187	3.577	72.277
		Std. Dev.	3.017	16.527	9.762	0.346	10.974	1.963	15.301	44155.58	6.173	2.940	41.036
2007	75	Mean	6.299	12.127	5.289	0.381	16.757	3.547	78.751	23850.96	13.842	2.794	81.201
		Std. Dev.	2.545	17.074	9.066	0.359	11.710	1.425	14.082	52646.65	10.008	2.169	42.054
2008	67	Mean	6.792	12.143	7.118	0.344	16.713	3.845	78.874	30890.52	12.369	2.565	86.478
		Std. Dev.	2.683	18.442	10.231	0.356	12.706	1.412	13.608	62775.35	7.376	2.215	29.757
2009	68	Mean	6.510	11.112	7.257	0.330	16.680	3.813	78.550	33800.89	12.959	3.018	86.085
		Std. Dev.	2.287	17.161	10.289	0.339	11.721	1.329	13.449	71343.04	7.146	2.756	36.378

2.5.2 Correlation Matrix

Table 3 reports the correlation matrix between variables in this study. The correlations between the dependent variable (interest margin) and the explanatory variables are shown in the first column of the table. As expected, net interest margins (NIM) are found to be positively correlated with small scale loans, the Lerner index, the ratio of overhead costs to total assets, and the ratio of equity to total assets. We observe, as expected, negative correlations between NIM and property loans, diversification, and the cost to income ratio, as well as between NIM and size. The ratio of non-performing loans to total loans, and the loans to deposits ratio, are found to be negatively correlated with NIM.

Table 3: Correlation Matrix

This table presents the pairwise correlation between the variables used in this study. NIM is the net interest margins (%). SMALL is the proportion of small scale loans to total loans (%). PROPERTY is the proportion of property loans to total loans (%). LERNER is the Lerner index. DIV is the diversification index (%). OVERHEAD is the ratio of operating costs to total assets (%). CIR is the cost to income ratio (%). ORTHOLNTA denotes the natural logarithm of total assets orthogonalized with equity. EQTA is the ratio of equity to total assets (%). NPL is the ratio of non-performing loans to total loans (%). LDR represents the loans to deposits ratio (%).

	NIM	SMALL	PROPERTY	LERNER	DIVER	OVERHEAD	CIR	ORTHOLNTA	EQTA	NPL	LDR	SOB	FOB	LISTED
NIM	1													
SMALL	0.378	1												
PROPERTY	-0.162	0.037	1											
LERNER	0.206	0.078	-0.083	1										
DIV	-0.393	-0.393	-0.077	0.115	1									
OVERHEAD	0.536	0.173	-0.033	-0.009	-0.233	1								
CIR	-0.250	0.032	0.142	-0.222	-0.246	0.254	1							
ORTHOLNTA	-0.200	-0.086	0.251	0.155	0.331	-0.219	-0.051	1						
EQTA	0.082	-0.143	-0.115	-0.035	0.066	-0.068	-0.326	-0.386	1					
NPL	-0.273	-0.106	-0.037	0.054	0.303	-0.095	0.248	-0.008	0.011	1				
LDR	-0.090	-0.271	-0.041	0.036	0.298	-0.100	-0.263	0.003	0.362	0.094	1			
SOB	0.564	0.491	-0.038	0.202	-0.325	0.241	-0.099	0.037	-0.260	0.131	-0.246	1		
FOB	-0.326	-0.379	-0.228	0.094	0.694	-0.302	-0.365	0.199	0.240	0.220	0.495	-0.362	1	
LISTED	-0.261	-0.178	0.332	-0.079	0.073	-0.106	0.270	0.138	-0.196	0.144	-0.120	-0.208	-0.278	1

2.5.3 Regressions

We analyze the determinants of interest margins of Indonesian banks by employing pooled regression and static panel regression techniques, as well as a two-step GMM estimator. Table 4 presents the regression results of pooled regression (columns 1, 2 and 3), random effect panel data (columns 4, 5 and 6), and two-step GMM estimation (columns 7, 8 and 9). The Wald test, the Sargan test, and the Arellano-Bond test (autocorrelation) of the GMM estimation meet the requirements. The Wald test in the random effect model is found to satisfy the requirement as well.

Table 4: Regressions Results

This table presents the results of pooled regression (column 1, 2 and 3), random effect panel data (column 4, 5 and 6), and two-step GMM estimation (column 7, 8 and 9). The dependent variable is net interest margins (NIM, presenting in percentage). SMALL is the proportion of small scale loans to total loans (%). PROPERTY is the proportion of property loans to total loans (%). LERNER is the Lerner index. DIV is the diversification index (%). OVERHEAD is the ratio of operating costs to total assets (%). CIR is the cost to income ratio (%). ORTHOLNTA denotes the natural logarithm of total assets orthogonalized with equity. EQTA is the ratio of equity to total assets (%). NPL is the ratio of non-performing loans to total loans (%). LDR represents the loans to deposits ratio (%). SOB is the dummy variable for state-owned banks. FOB represents the dummy variable for foreign banks. LISTED is the dummy variable for publicly traded banks. The values in parentheses are standard errors. The symbols *, ** and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable: Net Interest Margin (NIM)								
	Pooled			Random Effect			GMM		
	1	2	3	4	5	6	7	8	9
NIM (t-1)							0.378*** (0.030)	0.419*** (0.042)	0.387*** (0.030)
SMALL	0.010** (0.004)	0.008* (0.005)		0.013*** (0.004)	0.010** (0.005)		0.009** (0.004)	0.007 (0.005)	
PROPERTY	-0.038*** (0.009)	-0.041*** (0.011)	-0.035*** (0.009)	-0.014 (0.012)	0.003 (0.014)	-0.013 (0.012)	-0.002 (0.014)	0.013 (0.015)	-0.001 (0.013)
LERNER	0.555*** (0.149)	0.858*** (0.182)	0.611*** (0.146)	0.284** (0.124)	0.260** (0.131)	0.298** (0.123)	0.401** (0.168)	0.549*** (0.202)	0.445** (0.174)
DIV			-0.050*** (0.009)			-0.047*** (0.010)			-0.017** (0.008)
OVERHEAD	0.839*** (0.048)		0.861*** (0.047)	0.554*** (0.051)		0.580*** (0.050)	0.379*** (0.070)		0.378*** (0.072)
CIR	-0.049*** (0.005)		-0.054*** (0.005)	-0.035*** (0.005)		-0.038*** (0.005)	-0.026*** (0.004)		-0.027*** (0.004)
ORTHOLNTA		-0.268*** (0.075)			-0.485*** (0.120)			-0.412** (0.204)	
EQTA	0.059*** (0.012)	0.095*** (0.013)	0.050*** (0.011)	0.069*** (0.013)	0.112*** (0.015)	0.068*** (0.013)	0.060*** (0.009)	0.090*** (0.014)	0.062*** (0.009)

Table 4. (Continued)

	1	2	3	4	5	6	7	8	9
NPL	-0.053*** (0.019)	-0.113*** (0.021)	-0.030 (0.019)	-0.042** (0.017)	-0.078*** (0.016)	-0.027 (0.017)	-0.027** (0.012)	-0.059*** (0.018)	-0.021 (0.013)
LDR	0.004* (0.002)	0.006** (0.003)	0.002 (0.002)	0.005** (0.002)	0.006** (0.003)	0.004* (0.002)	0.009*** (0.002)	0.011*** (0.003)	0.008*** (0.002)
SOB	2.004*** (0.205)	3.167*** (0.259)	2.065*** (0.191)	2.631*** (0.361)	3.865*** (0.473)	2.754*** (0.335)	0.883*** (0.309)	1.677*** (0.342)	0.999*** (0.294)
FOB	-1.799*** (0.269)	-1.547*** (0.334)	-0.808** (0.323)	-1.596*** (0.416)	-0.901* (0.334)	-0.762* (0.443)	-1.517*** (0.486)	-0.200 (0.670)	-1.112** (0.529)
LISTED	-0.178 (0.207)	-0.058 (0.306)	0.086 (0.209)	-0.038 (0.284)	0.361 (0.344)	0.088 (0.279)	-0.436** (0.215)	0.008 (0.258)	-0.341 (0.218)
Year dummies	Included	Included	Included	Included	Included	Included	Included	Included	Included
Constant	Included	Included	Included	Included	Included	Included	Included	Included	Included
Method	Pooled	Pooled	Pooled	Panel (Random effect/GLS)	Panel (Random effect/GLS)	Panel (Random effect/GLS)	GMM	GMM	GMM
Observations	617	617	617	617	617	617	554	554	554
Overall R-squared	0.678	0.510	0.692	0.647	0.478	0.663			
R-Squared between				0.728	0.560	0.752			
R-Squared within				0.271	0.171	0.281			
Wald Test				chi2(19)= 462.59 (0.000)***	chi2(18)= 227.40 (0.000)***	chi2(19)= 513.87 (0.000)***	chi2(19)= 881.34 (0.000)***	chi2(18)= 842.04 (0.000)***	chi2(19)= 953.44 (0.000)***

Table 4. (Continued)

	1	2	3	4	5	6	7	8	9
Sargan Test							chi2(32)= 38.45 (0.201)	chi2(32)= 38.45 (0.201)	chi2(32)= 39.08 (0.181)
Arellano–Bond test for AR(1)							N(0, 1)= -3.341 (0.001)***	N(0, 1)= -3.495 (0.000)***	N(0, 1)= -3.376 (0.001)***
Arellano–Bond test for AR(2)							N(0, 1)= -0.029 (0.977)	N(0, 1)= -0.902 (0.367)	N(0, 1)= -0.030 (0.976)

As expected, we find a positive and significant impact of small scale loans (SMALL) on interest margins (NIM) in all models. Banks with a greater proportion of small scale loans in their loan portfolio set higher interest margins. In the pooled regression, the ratio of property loans to total loans (PROPERTY) has the expected negative effect on interest margins. However, the coefficient of this variable is not significant in the random effect panel data and GMM estimations. In line with Beck and Hesse (2009), the results suggest the structure of bank loan portfolios matters in the determination of interest margins. Banks set a higher interest margin if they are more exposed to relatively risky loans.

As shown in all models, we find that market power, measured by Lerner index (LERNER), is positively associated with interest margins, which confirms the findings of Maudos and de Guevara (2004) and Maudos and Solís (2009). Banks set higher interest margins when they face relatively-inelastic demand and supply functions in markets and are thus able to exercise their monopoly power (Ho and Saunders, 1981).

Our results showing negative coefficients of the diversification index (DIV) in all regression models are consistent with the loss leader hypothesis on the cross-subsidization strategy of income diversification (Lepetit *et al.*, 2008; Maudos and Solís, 2009). More-diversified banks charge lower interest rates as lower rates might attract new clients and lead to higher income from non-interest activities. Such clients are expected to buy fee-generating services from the bank. Subsequently, more-diversified banks have a lower interest margin.

We find that the ratio of overhead costs to total assets (OVERHEAD) is positively and significantly associated with interest margins using all methods. These results confirm the findings of Beck and Hesse (2009) and Maudos and Solís (2009). Maudos and de Guevara's (2004) proposed extension of the dealership model, which includes operating costs to represent bank efficiency in their production process, is similarly confirmed. As expected, the second proxy of efficiency, the cost to income ratio (CIR), has a negative impact on interest margins using all methods. This result confirms the findings of Maudos and de Guevara (2004), Maudos and Solís (2009) and Lopez-Espinosa *et al.* (2011).

We also find strong evidence regarding the negative effect of bank size on interest margins, as measured by the natural logarithm of total assets orthogonalized with equity (ORTHOLNTA). This negative impact confirms the hypothesis that large banks achieve economies of scale that can decrease their margins (Beck and Hesse, 2009; Fungáčová and Poghosyan, 2011). The ratio of equity to total assets (EQTA), which is a proxy of risk aversion, has a positive and significant coefficient in all of the regressions. In line with the dealership model (Ho and Saunders, 1981), higher managerial risk aversion will increase interest margins. This result is similar to those of previous studies, including Maudos and Solís (2009) and Poghosyan (2010).

Our results confirm the findings of Fungáčová and Poghosyan (2011) and show credit risk, measured by the ratio of non-performing loans to total loans (NPL), has a negative and significant effect on interest margins in the pooled and random effect regression models. The results are also in line with Hadad *et al.* (2011), who find depositor discipline in the Indonesian market is pronounced in the price of deposits. Depositors require a higher interest rate on deposits for riskier banks. The loans to deposits ratio (LDR) as the proxy for liquidity risk has a positive impact on bank margins using all regression methods. The results are consistent with the findings of Maudos and de Guevara (2004), López-Espinosa *et al.* (2011), and Chen and Liao (2011). More-liquid banks (banks with lower liquidity risk) with higher opportunity costs have lower interest margins.

Regarding the influence of bank ownership, the coefficient of the dummy for state-owned banks (SOB) exhibits a positive and significant sign in all our models. The results show that state-owned banks set higher interest margins than other banks. There are a number of possible explanations for such a result. First, a large number of small depositors perceive them as less risky because of implicit guarantees and too-big-to-fail considerations. That means these banks can easily obtain deposits at a lower cost than other funds. Second, as explained by Rosengard and Prasetyantoko (2011), the higher interest margins of Indonesian state-owned banks (both provincial and central) are mainly driven by inefficiency considerations. Third, labor surplus in these banks may contribute to an increase in operating costs that subsequently lead to an increase in their margins.

The coefficient of the dummy for foreign banks (FOB) is found to be negative and significant in all models. The results are consistent with those of previous studies, such as Martinez-Peria and Mody (2004), in which foreign banks are found to charge a lower interest margin than domestic banks. This evidence may result from foreign banks' better hard information and technology, which enable them to perform more efficiently than domestic banks.

Finally, we find little evidence of difference in interest margins between listed (LISTED) and non-listed banks in all models.

2.5.4 Robustness Checks

We conduct several robustness checks. First, we follow the method of Maudos and de Guevarra (2004) by replacing the Lerner index with the Herfindahl Hirschman Index (HHI), calculated on the basis of total assets, as a measure of banking market structure. As expected, the coefficient of HHI is positive and significant in some models, while the results for the other variables are stable (the results are presented in Appendix A).

Second, we exclude the dummy for state-owned banks (SOB), the dummy for foreign banks (FOB), and the dummy for listed banks (LISTED) to enable us to test the empirical model using fixed-effect panel data techniques. For all remaining variables, except for the Lerner index, the results are similar to those of the random effect regressions presented in columns 4-6 of Table 4. The effect of the Lerner index is slightly weaker but still significant.

2.6 Conclusion and Policy Implications

We analyze the determinants of net interest margins in Indonesia after the 1997/1998 financial crisis. We use data from 93 commercial banks from 2001 through 2009. We estimate the empirical model using pooled regression techniques as well as static and dynamic panel methods.

We confirm that the structure of loan portfolios matters in the determination of interest margins. In the context of Indonesian banking, small scale loans contribute to increased bank margins, whereas housing (property)

loans reduce interest margins. Our results also show that Indonesian banks with greater market power set higher interest margins. Furthermore, we corroborate the loss leader hypothesis on cross-subsidization of lending and non-interest activities. The results also validate the claim that higher margins are driven by higher operating costs, higher risk aversion and higher liquidity risk. Consistent with previous literature, the cost to income ratio is also found to negatively affect intermediation margins. In addition, we find credit risk has a negative impact on bank margins. We find strong evidence that large banks set lower interest margins.

We then turn our analysis to the role of ownership as a determinant of interest margins. Here, we find that state-owned (government) banks have lower margins than private banks. Our findings also confirm the lower margins foreign banks charge benefit the banking sector and the economy as a whole.

These empirical results have several noteworthy policy implications. First, we show banks with higher market power “enjoy” higher interest margins. Therefore, regulators should promote healthier banking competition specifically to improve transparency and disclosure on banking products. Second, the Bank Indonesia released the regulation regarding transparency of the prime lending rate in March 2011, but only for corporate, retail, housing and consumption loans. Extending the regulation on prime lending rates to include loans to micro, small and medium enterprises is strongly recommended. Third, the source of the positive impact of small scale loans on interest margins may be the fact that loans to MSMEs require a higher risk premium. Requiring banks charge a lower rate on these loans may not be the proper response, as these loans are costly and relatively risky. Regulators should therefore direct banks to appropriately estimate risk premia on loans to MSMEs, for instance by using credit scoring systems. Finally, regulators need to help banks perform more efficiently.

APPENDIX**Appendix A. Robustness Check – Alternative Measure of Market Structure****Table A1: Robustness Check – Alternative Measure of Market Structure**

This table presents the results of pooled regression (column 1, 2 and 3), random effect panel data (column 4, 5 and 6), and two-step GMM estimation (column 7, 8 and 9). The dependent variable is net interest margins (NIM, presenting in percentage). SMALL is the proportion of small scale loans to total loans (%). PROPERTY is the proportion of property loans to total loans (%). HHI is the Herfindahl Hirschman Index. DIV is the diversification index (%). OVERHEAD is the ratio of operating costs to total assets (%). CIR is the cost to income ratio (%). ORTHOLNTA denotes the natural logarithm of total assets orthogonalized with equity. EQTA is the ratio of equity to total assets (%). NPL is the ratio of non-performing loans to total loans (%). LDR represents the loans to deposits ratio (%). SOB is the dummy variable for state-owned banks. FOB represents the dummy variable for foreign banks. LISTED is the dummy variable for publicly traded banks. The values in parentheses are standard errors. The symbols *, ** and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable: Net Interest Margin (NIM)								
	Pooled			Random Effect			GMM		
	1	2	3	4	5	6	7	8	9
NIM (t-1)							0.407*** (0.030)	0.449*** (0.040)	0.419*** (0.031)
SMALL	0.010** (0.004)	0.009* (0.005)		0.013*** (0.004)	0.010** (0.005)		0.008* (0.004)	0.007 (0.005)	
PROPERTY	-0.039*** (0.009)	-0.044*** (0.011)	-0.037*** (0.009)	-0.015 (0.012)	0.004 (0.014)	-0.013 (0.012)	-0.001 (0.014)	0.016 (0.015)	-0.001 (0.014)
HHI	0.114 (0.078)	-0.021 (0.097)	0.097 (0.076)	0.172** (0.070)	-0.012 (0.082)	0.181** (0.068)	0.092* (0.049)	-0.021 (0.066)	0.114** (0.049)
DIV			-0.048*** (0.009)			-0.047*** (0.010)			-0.014* (0.008)
OVERHEAD	0.844*** (0.049)		0.866*** (0.048)	0.549*** (0.051)		0.571*** (0.051)	0.367*** (0.068)		0.358*** (0.070)
CIR	-0.053*** (0.005)		-0.058*** (0.005)	-0.035*** (0.005)		-0.039*** (0.005)	-0.028*** (0.004)		-0.029*** (0.004)
ORTHOLNTA		-0.222*** (0.076)			-0.501*** (0.125)			-0.338* (0.200)	

Table 5. (Continued)

	1	2	3	4	5	6	7	8	9
EQTA	0.056*** (0.012)	0.094*** (0.014)	0.047*** (0.012)	0.070*** (0.013)	0.114*** (0.015)	0.069*** (0.013)	0.061*** (0.010)	0.092*** (0.014)	0.065*** (0.009)
NPL	-0.045** (0.019)	-0.109*** (0.022)	-0.022 (0.019)	-0.038** (0.017)	-0.075*** (0.016)	-0.023 (0.017)	-0.028** (0.012)	-0.064*** (0.019)	-0.023* (0.013)
LDR	0.004* (0.002)	0.007** (0.003)	0.002 (0.002)	0.004* (0.002)	0.005* (0.003)	0.003 (0.002)	0.009*** (0.002)	0.012*** (0.003)	0.008*** (0.003)
SOB	2.118*** (0.205)	3.355*** (0.261)	2.203*** (0.191)	2.705*** (0.361)	3.963*** (0.500)	2.844*** (0.341)	1.037*** (0.297)	1.893*** (0.343)	1.177*** (0.283)
FOB	-1.738*** (0.271)	-1.435*** (0.339)	-0.791** (0.328)	-1.557*** (0.418)	-0.817 (0.558)	-0.723* (0.450)	-1.327*** (0.500)	-0.193 (0.631)	-1.028* (0.542)
LISTED	-0.154 (0.210)	-0.119 (0.311)	0.095 (0.212)	-0.040 (0.286)	0.373 (0.346)	0.089 (0.282)	-0.336 (0.209)	0.089 (0.245)	-0.256 (0.213)
Year dummies	Included	Included	Included	Included	Included	Included	Included	Included	Included
Constant	Included	Included	Included	Included	Included	Included	Included	Included	Included
Method	Pooled	Pooled	Pooled	Panel (Random effect/GLS)	Panel (Random effect/GLS)	Panel (Random effect/GLS)	GMM	GMM	GMM
Observations	617	617	617	617	617	617	554	554	554
Overall R-squared	0.670	0.491	0.683	0.639	0.466	0.663			
R-Squared between				0.73	0.546	0.752			
R-Squared within				0.266	0.170	0.281			

Table 5. (Continued)

	1	2	3	4	5	6	7	8	9
Wald Test				chi2(18)= 452.75 (0.000)***	chi2(17)= 210.67 (0.000)***	chi2(18)= 493.07 (0.000)***	chi2(18)= 897.39 (0.000)***	chi2(17)= 734.27 (0.000)***	chi2(18)= 950.37 (0.000)***
Sargan Test							chi2(32)= 40.10 (0.154)	chi2(32)= 40.51 (0.144)	chi2(32)= 41.23 (0.127)
Arellano–Bond test for AR(1)							N(0, 1)= -3.327 (0.001)***	N(0, 1)= -3.497 (0.000)***	N(0, 1)= -3.392 (0.001)***
Arellano–Bond test for AR(2)							N(0, 1)= -0.067 (0.947)	N(0, 1)= - 1.006 (0.314)	N(0, 1)= -0.071 (0.943)

CHAPTER 3

DETERMINANTS OF CROSS REGIONAL DISPARITY IN FINANCIAL DEEPENING: EVIDENCE FROM INDONESIAN PROVINCES

3.1 Introduction

Severe regional development disparity under the New Order regime in Indonesia (Akita and Alisjahbana, 2002; Aritenang, 2008) was believed to be due to strong centralization during such a regime⁴⁰. Following the harmful 1997/1998 economic crisis and the fall of the regime, decentralization and local democratization have been implemented as a part of the institutional reforms (Henderson and Kuncoro, 2011). Decentralization is expected to reduce inequality in economic development as the local governments at the provincial and district/municipal levels now have more latitude in establishing cooperation with organizations in foreign countries which could increase the openness of the regions (Aritenang, 2008). To bolster economic growth, one important aspect that should be considered is developing the financial sector to facilitate growth (e.g. King and Levine, 1993; Levine, 1997; Demircuc-Kunt and Maksimovic, 1998; Rajan and Zingales, 2003; Roe and Siegel, 2011). However, even though decentralization has already been extensively implemented, the degree of financial deepening in Indonesia still highly varies across regions. Indonesian commercial banks have performed well in terms of profitability and soundness; however, they fail to broaden access to finance, particularly for the poor as well as micro, small and medium enterprises, which therefore in general Indonesia are still categorized as “underbanked” (Rosengard and Prasetyantoko, 2011).

The present paper investigates the determinants of cross-region differences in financial deepening in Indonesia. More specifically we investigate whether local governance and socioeconomic conditions contribute to determine the level of financial deepening which is measured by three proxies: the ratio of loans to province’s GDP, the ratio of loans granted to micro, small, and medium enterprises (MSMEs)⁴¹ over province’s GDP and the ratio of commercial bank

⁴⁰ The New Order (Indonesian: *Orde Baru*) regime under President Soeharto led Indonesia for 32 years (1966-1998). President Soeharto stepped down in May 1998 when the chronic 1997/1998 economic crisis dragged the country into a social riot.

⁴¹ Micro, small and medium enterprises are dominant business units in Indonesia. These firms represent a significant contribution both in urban and in rural areas. Therefore, bank lending to micro, small and medium enterprises is an important issue in Indonesia (Trinugroho *et al.*, 2012).

offices per million province's population⁴². We extend the literature on the determinants of financial deepening by studying differences within a country instead of differences across countries which enables us to reduce noise and the number of controlling factors in our investigation. Controlling for regional characteristics, we find that poor local governance is significantly and negatively associated with financial deepening. Our results also reveal that in the socioeconomically less developed regions, the level of financial deepening is significantly lower than that of more developed regions.

The rest of this paper is structured as follows. Section 3.2 reviews previous work on related issues. We discuss the institutional background in Indonesia in section 3.3. In Section 3.4, we describe the methodology. Section 3.5 reports the results and robustness checks. Section 3.6 concludes our findings and provides policy implications.

3.2 Literature Review

Financial deepening is generally defined as the growth in the scale of financial transactions related to the real economy (Hamori and Hashiguchi, 2012). A growing body of literature has outlined factors determining cross-country differences in financial development particularly stressing on institutional factors. According to the seminal papers of La Porta *et al.* (1997, 1998) on law and finance, that have empirically examined (e.g. La Porta *et al.*, 1997, 1998, Levine, 1998, Beck *et al.*, 2003; Gallindo and Micco, 2004; Gallindo and Micco, 2005; Laeven and Majnoni, 2005; Djankov *et al.*, 2007; Dehesa *et al.*, 2007; Dietrich *et al.*, 2009), several country-level variables - related to legal institutions such as legal origin, credit rights, rule of law and quality of law enforcement - matter to explain some aspects of finance, for instance credit to private sector, capital market development, investor protection and cost of financial intermediation. La Porta *et al.*, (1997) and Levine, (1998), in a cross country study, find that the breadth of the credit market is positively correlated with good law enforcement and protection of creditor rights. Creditor rights protection stimulates both lenders

⁴² We focus on the banking development as the measure of financial deepening because the capital market and other financial intermediation institutions were still relatively underdeveloped and highly concentrated in some large cities.

and borrowers to enter into financial contracts and subsequently boosts financial development (Galindo and Micco, 2004). Djankov *et al.* (2007) underline two major determinants of private credit as suggested by economic theory. First, the power of creditors which reflects how easy lenders can force repayment, take collateral or even take control of the firm plays an important role. Second, the quality of information is also important as lenders would more likely act as lenders if they are well-informed on the borrowers. Rajan and Zingales (2003) and Becerra *et al.* (2012) emphasize the impact of political factors on financial development. Another comprehensive explanation on the determinants of financial development is provided by Herger *et al.* (2008) highlighting three determinants of a country's financial development: cultural heritage, institutional factors, and the degree of openness and transparency. More recently, Roe and Siegel (2011) underline the impact of political stability on financial development indicating that after controlling for investor protection, legal origin, and trade openness, political instability can significantly impede a country's financial development.

Referring to those who work on the matter of institutional factors, first, we consider that the quality of local governance greatly influences the level of provincial financial depth. As explained by Rajan and Zingales (2003), government interventions in the financial sector development should be in the forms of improving property rights, promoting transparency and disclosure, ensuring legal system effectiveness, and facilitating regulatory infrastructure. Although law including its features is generally identical among regions within a country, the quality of its enforcement is not necessarily the same. Accordingly, the quality of local governance is important to ensure that legal institutions are well enforced particularly regarding the creditor/ lender rights. Moreover, local governance, especially with regard to the bureaucratic process in doing business, indicates how well the local government facilitates favorable business conditions. Poor governance is highly associated with corruption and rent seeking behaviors which are detrimental factors to business investment and public infrastructure development. Subsequently, commercial banks may be reluctant to establish their business in the poor governance regions because it is quite risky and costly.

Another major factor that could determine the degree of financial intermediation at the provincial level in Indonesia is the socioeconomic conditions. The socioeconomic conditions represent some aspects of quality of life such as education, poverty, life expectancy, living standards, and unemployment. Related to financial deepening, the impact of socioeconomic conditions could be viewed from lender (banks) and borrower sides. From the lender side, as argued by Djankov *et al.*, (2007) and Japelli and Pagano (2002) lenders would be more willing to deal with borrowers if they are well informed. Hence, in the socioeconomically less developed regions banks have less incentives to channel credits as the information as well as the quality of borrowers are inadequate. It is therefore more expensive for banks to grant loans in terms of information and dealing costs. Moreover insufficient quality of borrowers could increase bank credit risk.

From the borrower side, the decision to borrow money from banks is also determined by socioeconomic conditions. For instance, for less educated people, the process of getting loans from banks may be perceived as more complicated than the process of obtaining a loan from predatory lender⁴³ or a pawnshop. Therefore, they tend to avoid borrowing money from commercial banks.

3.3 Institutional Background

As an archipelago and comprised of so many ethnic groups with different languages, religions, and traditions, it is quite difficult to manage Indonesia and to achieve equal economic development. The New Order regime applied the “trickle-down economics” theory which relied on growth as the most important element in economic development. It was expected that this economic system would lead to a common prosperity because the trickle-down effect could also reach the poor. However, the implementation of this system failed. The chronic 1997/1998

⁴³ Predatory lending in Indonesia is a non-bank lending with high interest rate charged mostly on daily or weekly repayment basis. It is slightly different with the concept of payday lending that has been regulated in some states in the US (*e.g.* Stegman and Faris, 2003; Stegman, 2007; Morse, 2011). Payday lending is a source of short-term consumer credit in low- and moderate-income communities given to those having fixed-income (mostly salary), while predatory lending in the Indonesia’s case is such loans given to those with or without (mostly without) fixed-income. In the Indonesian language, such money lenders are usually called *rentenir* or *tengkulak* or *bank plecit*.

economic crisis dragged the country into a social and political unrest and it generated a serious conflict of class between the poor and the rich as the gap between the two has widened over the years (Ansari, 2007). Economic development inequality across regions was also pronounced during the regime.

The Indonesia's institutional reforms which were implemented in the latter half of 1998 have led the country to become more democratized, decentralized, and deregulated (Mursitama, 2006; Henderson and Kuncoro, 2011). Referring to the Indonesian decentralization Law No 22/1999, the local governments now have authorities in all governmental functions except foreign policy, security and defense, religion, judiciary, fiscal and monetary policy, and some other aspects. Moreover, local governments are also permitted to establish cooperation with organizations in foreign countries which could increase their openness (Aritenang, 2008), and subsequently should accelerate the financial development of the regions (Herger *et al.*, 2008). On the other hand, however, decentralization and local democratization lead to abuse of power as well. Many powerful local political figures play dominant roles in many aspects. They tend to act as "little kings" including providing privileges to those who seek the rents.

For years, broadening access to finance, particularly for the poor as well as micro, small and medium enterprises (MSMEs), has been a central issue in Indonesia. Even though this country is known as an example of the success of microfinance⁴⁴ (Hamada, 2010), Indonesia is generally still "underbanked" (Rosengard and Prasetyantoko, 2011), especially with regard to access to finance for the poor and MSMEs. Moreover, paradoxically, this credit constraint is strengthened by bank regulation; for risk management purposes, bank borrowers' income has to exceed three times the borrowed funds. Another regulatory constraint to widen access to bank financing, as revealed by Rosengard and Prasetyantoko (2011), is the introduction of Indonesian banking architecture (Indonesian: *Arsitektur Perbankan Indonesia/ API*)⁴⁵ stressing banking

⁴⁴ Hamada (2010) exemplifies BRI (Indonesian: *Bank Rakyat Indonesia*), the third largest Indonesian state-owned bank, as the one of the world's most successful commercialization of microfinance as it is supported by nationwide network of microfinance local units enabling this bank to release large quantity of loans.

⁴⁵ The Indonesian Banking Architecture, a road map of the Indonesian banking sector which would be implemented gradually, was introduced by the Indonesian government in 2004 (Trinugroho *et al.*, 2012).

consolidation which subsequently has strengthened market power exacerbating the inefficiency of bank intermediation.

3.4 Methodology

We investigate the determinants of financial deepening across regions in Indonesia after the decentralization process. We use panel data for 33 provinces from 2004 to 2010.

3.4.1 Variables and Data

- *Financial Depth*

As explained earlier, we have three proxies of our dependent variable (financial depth) which are:

- The ratio of credit released by commercial banks located in a province to province's GDP
- The ratio of commercial bank loans given to micro, small and medium enterprises in a province over the province's GDP
- The ratio of number of bank branches per million population of the province

Data on bank loans, bank loans to MSMEs and commercial bank offices at the provincial level are collected from Bank Indonesia (Central bank of Indonesia), while data on provinces' GDP and provinces' population come from the Indonesia Statistics Bureau (Indonesian: *Biro Pusat Statistik/ BPS*).

- *Local Governance*

To measure local governance, we rely on the local governance index released by the Partnership (Indonesian: *Kemitraan*), a multi-stakeholder organization which is assigned to promote and institutionalize good governance principles in Indonesian society by implementing harmonized reform programs to strengthen public service governance, deepen democracy, improve security and justice and improve economic and environmental governance. This index defines governance as the process of formulation and implementation of rules and regulation through interaction between state, civil society, and economic society. Therefore, it consists of four sub-indexes which are bureaucracy index,

government index, civil society index, and economic society index. However, as the focus of local governance in this paper is to assess the government roles in promoting financial development, we only take the bureaucracy index and government index as the proxies of local governance. The bureaucracy index reflects the governance of public service, local revenue collection and the regulation of the local economy, while the government index measures the governance of the government functions which are regulatory function, development coordination and budget allocation function. Each index consists of six principles of governance which are participation, fairness, accountability, transparency, efficiency and effectiveness. The score ranges from 0 to 10.

- *Regional Socioeconomic Conditions*

Socioeconomic conditions reflect some aspects of quality of life. Therefore, human development and the level of poverty could be considered as suitable proxies for regions' socioeconomic conditions.

- Human Development Index

We retrieve data on the regional human development index (HDI) from the BPS. Referring to the UNDP, the BPS defines the human development index as a process of enlarging the choice of people. Therefore, there are three aspects in measuring the HDI which are life expectancy, education and living standards.

- Poverty

We obtain data on the level of poverty of regions from the BPS. The level of poverty is measured as the number of population below the poverty threshold (line) to total population.

- *Control Variables*

- Conflict Regions

We include a dummy variable for regions that are unstable in terms of politic and security (conflict regions). The dark side of the institutional reforms is political instability in some regions which lead to a disintegration problem as they insist to be much more decentralized. Roe and Siegel (2011) also find that cross country difference in financial development is also influenced by the level of political stability.

- Outside Java island

Indonesia has a unique feature regarding its location that is geographically spread out. To control for this geographical aspect, we account for a dummy variable taking a value of 1 for provinces situated outside the Java Island. Java is considered as the most developed island in Indonesia as it benefited much more from the centralization policy of the New Order regime. Java is also the island where the capital of Indonesia (Jakarta) is located.

- New Province

Another implication of the institutional reforms was splitting some provinces into new provinces. Before the reforms, the number of provinces was 27 provinces. 7 new provinces emerged early after the reforms and 1 province (East Timor) decided to become a new country. Therefore currently Indonesia consists of 33 provinces. To account for possible differences in financial development between new provinces and existing provinces, we include a dummy variable for new provinces.

- Budget Deficit

We include a dummy variable taking a value of 1 for regions with governments facing budget deficits following the study of Gallindo and Micco (2004). Two contradictory consequences may arise concerning the impact of deficits of local government budgets on financial deepening. As argued by Chen *et al.* (2011), budget deficits could increase incentive to rent-seeking which is a detrimental factor to investment and business growth. On the other side, budget deficits could also encourage the local government to promote investments and infrastructure development through public-private partnerships which subsequently could increase the bank lending for project financing.

We collect information regarding the budget of local governments from the Supreme Audit Institution (Indonesian: *Badan Pemeriksa Keuangan/ BPK*). Local governments have to report their financial reports to the BPK for the auditing purpose.

- GDP per Capita

We also control for natural log of GDP following the studies of Gallindo and Micco (2004) and Roe and Siegel (2011). Data on regional GDP as well as provincial population are obtained from the BPS. Because the data on population are based on ten-yearly census, we interpolate them to get yearly data.

- Oil or Gas Producer

The last control variable is a dummy variable to account for regions which are oil or gas producers. Data to identify whether a region is an oil or gas producer is obtained from the Ministry of Energy and Natural Resources.

3.4.2 Estimation Strategy

We use OLS to run our specifications on the determinants of financial development following the studies of Galindo and Micco (2004) and Dehesa *et al.* (2007) in a cross-country study. As the bureaucracy index and government index are highly correlated, we do not introduce these two variables concurrently. Similarly, because of their strong correlations, we do not introduce variables such as the human development index, the poverty variable and the dummy for conflict regions at the same time.

3.5 Results

3.5.1 Descriptive Statistics and Correlation of variables

Descriptive statistics of variables is presented in table 1. We present the statistics of financial depth for each province in table 2. Table 3 exhibits the correlation matrix of variables.

Table 1: Descriptive Statistics

This table presents the descriptive statistics of variables. CRE_GDP is the ratio of credit released by commercial banks located in a province to province's GDP. SME_GDP is the ratio of commercial bank loans given to micro, small and medium enterprises in a province over province's GDP. OFF_POP is the ratio of number of bank branches per million population of province. BUREAU is the bureaucracy index, while GOVERN stands for the government index. HDI represents human development index. POVERTY is the level of poverty. LNGDPPERCAP is the natural log of province GDP per capita.

	CRE_GDP	SME_GDP	OFF_POP	BUREAU	GOVERN	HDI	POVERTY	LNGDPPERCAP
Mean	0.217	0.179	15.330	5.609	4.945	70.292	16.695	16.295
Median	0.183	0.165	12.236	5.740	4.920	70.320	14.625	16.234
Maximum	0.997	0.667	62.579	7.340	6.800	77.600	41.570	18.448
Minimum	0.028	0.041	3.535	3.880	3.530	60.600	3.180	14.901
Std. Dev.	0.152	0.104	10.561	0.838	0.851	3.294	8.625	0.719
Skewness	2.637	1.837	2.180	-0.304	0.275	-0.349	0.826	0.762
Observation	222	213	231	231	231	231	226	231

Table 2: Descriptive Statistics of Financial Depth Each Province

No	Province	Average credit to province's GDP	Average credit to MSMEs over province's GDP	Average bank branches to million province's population
1	Jawa Barat	0.151585	0.167045	7.549934
2	Banten	0.211209	0.216435	6.09837
3	DKI Jakarta	0.804159	0.211325	54.69153
4	D.I Yogyakarta	0.233692	0.195186	13.86315
5	Jawa Tengah	0.191211	0.146325	7.713605
6	Jawa Timur	0.174687	0.113382	9.607461
7	Bengkulu	0.233627	0.237419	9.823258
8	Jambi	0.181039	0.166913	14.49752
9	Nanggroe Aceh Darussalam	0.112975	0.105513	12.7248
10	Sumatera Utara	0.277216	0.144166	11.32808
11	Sumatera Barat	0.190449	0.152634	15.40538
12	Riau	0.098391	0.071691	10.02068
13	Sumatera Selatan	0.089371	0.064844	5.442373
14	Kepulauan Riau	0.322449	0.252285	43.30654
15	Bangka Belitung	0.113382	0.08813	18.38444
16	Lampung	0.17065	0.133475	5.89149
17	Kalimantan Selatan	0.227636	0.169252	17.09068
18	Kalimantan Barat	0.176742	0.148041	11.49368
19	Kalimantan Timur	0.07343	0.049332	28.01721
20	Kalimantan Tengah	0.130586	0.097066	12.95606
21	Sulawesi Tengah	0.201794	0.18609	10.67918
22	Sulawesi Selatan	0.30837	0.243932	11.43564
23	Sulawesi Utara	0.242101	0.275376	21.77532
24	Sulawesi Barat	0.277152	0.22098	10.31237
25	Gorontalo	0.495298	0.557642	23.33381
26	Sulawesi Tenggara	0.060666	0.05699	4.1979
27	Nusa Tenggara Barat	0.148065	0.151064	7.394472
28	Bali	0.304769	0.270322	20.94691
29	Nusa Tenggara Timur	0.2221	0.217585	8.981006
30	Maluku	0.293108	0.276596	19.5568
31	Papua	0.076143	0.067278	13.15871
32	Maluku Utara	0.276154	0.262264	14.94563
33	Irian Jaya Barat	0.129386	0.100658	25.84427

As presented in the descriptive statistics in table 2, the average ratio of credit released by commercial banks located in Jakarta to Jakarta's GDP during the period we study is 80.41% (the maximum), while 6.07% is the minimum average of such a ratio which is for the province of Sulawesi Tenggara. As shown in table 1, the standard deviation of this ratio is 15.2%, while the standard deviation of the ratio of commercial bank loans given to micro, small and medium enterprises in a province over the province's GDP is 10.4%. The data clearly show that the level of financial deepening is imbalanced across regions. If we turn to the ratio of the number of bank branches per million population of province, again we notice a large dispersion among regions. During the observation period, the average of this ratio for Jakarta is 54 bank branches per million of inhabitants, while in Sulawesi Tenggara, 4 bank offices per million people is the average.

Table 3: Correlation Matrix

This table presents the descriptive statistics of variables. CRE_GDP is the ratio of credit released by commercial banks located in a province to province's GDP. SME_GDP is the ratio of commercial bank loans given to micro, small and medium enterprises in a province over province's GDP. OFF_POP is the ratio of number of bank branches per million population of province. BUREAU is the bureaucracy index, while GOVERN stands for the government index. HDI represents human development index. POVERTY is the level of poverty. CONFLICT is a dummy variable for regions that are unstable in terms of politic and security (conflict regions). OUTJAVA is a dummy variable taking a value of 1 for provinces situated outside the Java Island. NEWPROV is a dummy variable for new provinces. DEFICIT is a dummy variable taking a value of 1 for regions with governments facing budget deficits LNGDPPERCAP is the natural log of province GDP per capita. OIL is a dummy variable to account for regions which are oil or gas producers

	CRE_GDP	SME_GDP	OFF_POP	BUREAU	GOVERN	HDI	POVERTY	CONFLICT	OUTJAVA	NEWPROV	DEFICIT	LNGDPPERCAP	OIL
CRE_GDP	1												
SME_GDP	0.637	1											
OFF_POP	0.660	0.280	1										
BUREAU	0.409	0.280	0.343	1									
GOVERN	0.312	0.065	0.314	0.697	1								
HDI	0.310	0.018	0.459	0.307	0.233	1							
POVERTY	-0.261	-0.003	-0.310	-0.338	-0.279	0.633	1						
CONFLICT	-0.110	-0.043	0.046	-0.454	-0.260	0.334	0.550	1					
OUTJAVA	-0.247	0.036	-0.109	-0.299	-0.369	0.251	0.139	0.199	1				
NEWPROV	0.176	0.394	0.220	0.029	-0.210	0.110	0.028	0.217	0.101	1			
DEFICIT	0.147	0.101	0.128	0.126	0.082	0.116	-0.093	-0.010	0.020	0.139	1		
LNGDPPERCAP	0.125	-0.352	0.571	0.202	0.302	0.587	-0.393	-0.123	-0.180	-0.096	0.124	1	
OIL	-0.039	-0.348	0.136	-0.003	0.224	0.364	-0.160	-0.016	-0.149	-0.190	0.026	0.398	1

As expected, the correlation matrix shows that the proxies of local governance which are the bureaucracy index and the government index are positively correlated with all of our dependent variables. We also find that the human development index is positively correlated with the proxies of financial depth, while the level of poverty is negatively correlated with the financial depth's measures.

3.5.2 Empirical Results

Table 4 presents the results of OLS regression of our first proxy of financial depth which is the ratio of credit released by commercial banks located in a province to local GDP. Our results show that provinces with a higher level of bureaucracy index have a significantly higher ratio of commercial bank credit to local GDP. Likewise, the government index is significantly and positively associated with our first measure of financial depth. Turning to the impact of socioeconomic conditions, as expected, we find that human development index is positively associated with the level of bank loans to province's GDP. Similarly, the ratio of loans released by commercial banks located in a province to province's GDP is significantly lower for the provinces with a higher level of poverty.

Table 5 reports the results of OLS regressions of the ratio of commercial bank loans given to micro, small and medium enterprises (MSMEs) in a province over province's GDP. The coefficients of bureaucracy index and government index are all positive and significant. Similar results are found for the coefficients of the human development index. Poverty is negatively associated with the depth banks released loans to MSMEs.

Table 4: OLS Regressions of Bank Loan to Region's GDP

This table presents the results of OLS regressions. The dependent variable is the ratio of credit released by commercial banks located in a province to province's GDP. The values in parentheses are robust standard errors. *, ** and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Bank Loan/ GDP					
	1	2	3	4	5	6
Bureaucracy Index	0.057*** (0.014)	0.061*** (0.016)	0.059*** (0.015)			
Government Index				0.063*** (0.014)	0.060*** (0.015)	0.061*** (0.014)
Human Development Index	0.012*** (0.002)			0.015*** (0.002)		
Poverty		-0.002** (0.0009)			-0.002*** (0.0008)	
Conflict			-0.074*** (0.017)			-0.111*** (0.016)
Outside Java	-0.052* (0.028)	-0.059** (0.029)	-0.055* (0.029)	-0.041 (0.028)	-0.055* (0.030)	-0.046 (0.029)
New Province	0.044* (0.023)	0.035 (0.024)	0.041* (0.024)	0.078*** (0.023)	0.065*** (0.026)	0.074*** (0.024)
Budget Deficit	0.018 (0.027)	0.017 (0.027)	0.017 (0.027)	0.018 (0.027)	0.018 (0.027)	0.016 (0.027)
Natural Log GDP Per Capita	-0.027 (0.023)	-0.014 (0.023)	0.002 (0.025)	-0.028 (0.022)	-0.019 (0.023)	0.004 (0.026)
Oil or Gas Producer	-0.024 (0.016)	-0.010 (0.016)	-0.013 (0.015)	-0.047** (0.018)	-0.028** (0.023)	-0.032* (0.017)
Constant	-0.403 (0.451)	-0.230 (0.417)	-0.062 (0.440)	-0.499 (0.464)	0.363 (0.399)	-0.058 (0.446)
Year dummies	Included	Included	Included	Included	Included	Included
Method	OLS	OLS	OLS	OLS	OLS	OLS
Number of Province	33	33	33	33	33	33
Number of Observations	221	221	221	221	221	221
Period	2004-2010	2004-2010	2004-2010	2004-2010	2004-2010	2004-2010
R-Squared	0.278	0.253	0.259	0.295	0.248	0.267

Table 5: OLS Regressions of Bank Loan to MSMEs over Region's GDP

This table presents the results of OLS regressions. The dependent variable is the ratio of commercial bank loans given to micro, small and medium enterprises in a province over province's GDP. The values in parentheses are robust standard errors. *, ** and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Bank Loan to MSMEs/ GDP					
	1	2	3	4	5	6
Bureaucracy Index	0.039*** (0.008)	0.045*** (0.010)	0.042*** (0.009)			
Government Index				0.042*** (0.009)	0.040*** (0.011)	0.040*** (0.010)
Human Development Index	0.009*** (0.001)			0.011*** (0.001)		
Poverty		-0.001 (0.001)			-0.001* (0.0007)	
Conflict			-0.047*** (0.010)			-0.073*** (0.010)
Outside Java	0.010 (0.010)	0.003 (0.010)	0.006 (0.010)	0.018 (0.012)	0.004 (0.011)	0.011 (0.011)
New Province	0.082*** (0.019)	0.077*** (0.020)	0.080*** (0.019)	0.104*** (0.021)	0.099*** (0.023)	0.102*** (0.022)
Budget Deficit	-0.003 (0.014)	-0.003 (0.015)	-0.004 (0.015)	-0.004 (0.014)	-0.003 (0.015)	-0.005 (0.015)
Natural Log GDP Per Capita	-0.084*** (0.010)	-0.071*** (0.009)	-0.063*** (0.010)	-0.090*** (0.010)	-0.073*** (0.009)	-0.060*** (0.010)
Oil or Gas Producer	-0.033*** (0.011)	-0.022** (0.011)	-0.024** (0.011)	-0.048** (0.012)	-0.035*** (0.012)	-0.037*** (0.012)
Constant	0.743*** (0.149)	1.140*** (0.143)	1.011*** (0.152)	0.664*** (0.150)	1.227*** (0.142)	1.003*** (0.146)
Year dummies	Included	Included	Included	Included	Included	Included
Method	OLS	OLS	OLS	OLS	OLS	OLS
Number of Province	33	33	33	33	33	33
Number of Observations	212	212	212	212	212	212
Period	2004-2010	2004-2010	2004-2010	2004-2010	2004-2010	2004-2010
R-Squared	0.524	0.484	0.495	0.529	0.460	0.487

Table 6: OLS Regressions of Bank Branches to Population (Million)

This table presents the results of OLS regressions. The dependent variable is the ratio of number of bank branches per million population of province. The values in parentheses are robust standard errors. *, ** and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Bank Branches/ Population (million)					
	1	2	3	4	5	6
Bureaucracy Index	2.251*** (0.689)	2.898*** (0.725)	2.716*** (0.697)			
Government Index				3.043*** (0.602)	3.142*** (0.679)	3.066*** (0.647)
Human Development Index	0.628*** (0.127)			0.787*** (0.142)		
Poverty		0.006 (0.054)			-0.026 (0.056)	
Conflict			-0.866 (1.260)			-2.702** (1.248)
Outside Java	2.556 (1.664)	1.948 (1.670)	2.116 (1.695)	3.360** (1.601)	2.352 (1.656)	2.736 (1.662)
New Province	7.417*** (1.373)	6.467*** (1.471)	6.938*** (1.394)	9.128*** (1.254)	8.136*** (1.403)	8.689*** (1.326)
Budget Deficit	0.437 (1.394)	0.494 (1.420)	0.436 (1.416)	0.261 (1.360)	0.442 (1.400)	0.307 (1.396)
Natural Log GDP Per Capita	8.151*** (1.235)	9.050*** (1.219)	9.325*** (1.248)	7.606*** (1.197)	8.813*** (1.248)	9.396*** (1.348)
Oil or Gas Producer	-1.669 (1.028)	-1.067 (1.141)	-0.946 (1.120)	-2.621** (1.084)	-1.958* (1.154)	-1.850 (1.147)
Constant	-179.08*** (22.313)	-152.25*** (22.010)	-155.95*** (22.340)	-184.20*** (23.482)	-147.28*** (21.0253)	-157.21*** (22.612)
Year dummies	Included	Included	Included	Included	Included	Included
Method	OLS	OLS	OLS	OLS	OLS	OLS
Number of Province	33	33	33	33	33	33
Number of Observations	230	225	230	230	225	230
Period	2004-2010	2004-2010	2004-2010	2004-2010	2004-2010	2004-2010
R-Squared	0.504	0.469	0.484	0.523	0.475	0.494

Table 6 exhibits the results of OLS regressions of the ratio of number of bank branches per capita. Similarly to those obtained for the two first dependent variables, we find evidence that local governance matter to explain the level of financial deepening. Regions with good governance, represented by a high degree of bureaucracy index and government index, have a higher level of financial deepening. As expected, we also find that the coefficient of the human development index is positive and significant in all the regressions.

In general, our results provide evidence that unequal financial deepening in Indonesia is significantly influenced by how well the local governments manage their regions. There are several possible explanations. First, as argued by the law and finance literature (*e.g.* La Porta *et al.*, 1997; Levine, 1998), the quality of local government is important to ensure that legal institutions are well-imposed especially with regard to the creditor/ lender rights to stimulate banks in channeling credit. Second, bureaucratic procedure in doing business indicates to which extent the local government is capable of facilitating a favorable business climate to attract business investments. This is consistent with some cross country studies which show the positive relationship between the degree of openness and financial development (*e.g.* Herger *et al.*, 2008; Rajan and Zingales, 2003). Moreover, it is generally known that governments with poor governance are keen on corruption and rent seeking behaviors, which are detrimental factors to business investment and public infrastructure development. Subsequently, commercial banks and other types of banks may be reluctant to establish their business in the poor governance regions which in turn impedes banking competition in the regions.

Our results also show that in the socioeconomically less developed regions, the level of financial deepening is lower than that of more developed regions. Overall, this finding is consistent with our expectations. As explained earlier, the impact of socioeconomic conditions on the level of financial deepening could be viewed from lender (banks) and borrower sides. From the

lender side, it is generally accepted that lenders are much more willing to channel loans when they know more about borrowers (Djankov *et al.*, 2007). In the socioeconomically less developed regions, reflected by high degree of poverty and low human development, banks lack incentives to release credit as the information as well as the quality of borrowers are deficient. To grant loans, banks face expensive costs in terms of information and dealing costs. Furthermore, banks have to deal with borrowers with lower quality which subsequently increases their risk. Even though banks could charge a higher risk premium to cover the higher risk, Indonesian banks generally tend to behave prudently. On the other hand, in such regions deficit spending units also tend to be reluctant to use bank loans as they perceive that the process of getting loans from banks is more complicated than the process of obtaining, for example a loan from predatory lender or a pawnshop.

Moreover, some banking regulations might have exacerbated the unequal banking development. First, the regulation on the income of bank borrowers have naturally created a barrier to financial deepening. Second, as revealed by Rosengard and Prasetyantoko (2011), the banking consolidation process which has been promoted by regulators has strengthened banking oligopoly maintaining a high intermediation cost.

Regarding control variables, we find that the level of financial deepening is lower in the conflict (politically and securitically unstable) regions than in other regions. The results confirm the finding of Roe and Siegel (2011) in a cross country research showing that political instability impedes financial development. Second, we find that credit released by commercial banks is lower in the provinces located outside Java Island even though the ratio of bank offices per capita is higher in such regions. Our results also show that there is a significant difference in financial development between existing provinces and new provinces. Interestingly, the latter have a significantly higher level of financial depth. We find that the ratio of number of bank branches per capita is positively

associated with GDP per capita. In contrast, the ratio of commercial bank loans given to micro, small and medium enterprises (MSMEs) in a province to its GDP is lower in the regions with a higher ratio of GDP per capita. No difference in financial deepening is found between deficit and surplus budget provinces. Likewise, we find only little evidence of differences in financial depth between regions which produce oil or gas and their non-producer counterparts.

3.5.3 Robustness Checks

We perform several robustness checks. First, we use secondary school enrolment following the study of Hasan *et al.* (2009) as a proxy of socioeconomic conditions to replace the human development index. Contextually, the Indonesian government has also implemented a policy that the minimum education should be secondary (junior high) school⁴⁶. The results show that provinces with a higher level of secondary school enrollment significantly have a higher level of financial depth. For all the remaining variables the results are also consistent.

Second, we run regressions by excluding the natural log of GDP per capita as it has a strong correlation with the proxies of socioeconomic conditions (human development index and poverty). With regard to our variables of interest (local governance and socioeconomic variables), our results remain unchanged.

Third, we change the proxies of financial depth to the ratio of bank loans to province's population and the ratio of bank loans to MSMEs over province's population. Again, the results show that local governance and socioeconomic conditions matter to explain cross region differences in financial deepening.

⁴⁶ This policy is called nine-year compulsory education (Indonesian: *wajib belajar sembilan tahun*).

3.6 Conclusions

We investigate the determinants of unequal financial deepening across regions in Indonesia by considering local governance and socioeconomic conditions as the main factors. We use data of 33 provinces over the 2004-2010 period (after the decentralization policy).

We find that local governance quality is significantly and positively associated with the importance of bank lending - and to MSMEs specifically - with regards to local GDP. Local governance quality is also positively linked with the number of bank offices per capita. Our results also show that in the socioeconomically less developed regions, as reflected by low human development and high degree of poverty, the level of financial deepening is lower than that of more developed regions. In general, even though decentralization has been implemented globally in Indonesia, regional disparity in the form of financial deepening still exists.

Our findings have some noteworthy policy implications. First, improving local governance, particularly for regions having poor governance, should be encouraged to facilitate a favorable business environment. An encouraging business climate could provide incentives for banks to expand their business more specifically in granting loans. Second, regulators have to reconsider regulations that have constrained bank lending especially the regulation on the income of bank borrowers and its strong limitations. This regulation might have improved the soundness of banks but it might also have gone too far by excluding a large number of borrowers from the formal system encouraging "predatory lending" practices in the financially less developed regions.

APPENDIX**Appendix A. Robustness Check – Alternative Measure (Secondary School Enrolment)****Table A.1: Robustness Check – Alternative Measure (Secondary School Enrolment)**

This table presents the results of OLS regressions. The dependent variables are the ratio of credit released by commercial banks located in a province to province's GDP, the ratio of commercial bank loans given to micro, small and medium enterprises in a province over the province's GDP and the ratio of number of bank branches per million population of the province. The values in parentheses are robust standard errors. *, ** and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Bank Loan/ GDP		Bank Loan to MSMEs/ GDP		Bank Branches/ Population	
	1	2	1	2	1	2
Bureaucracy Index	0.065*** (0.016)		0.045*** (0.009)		2.778*** (0.759)	
Government Index		0.064*** (0.015)		0.042*** (0.01)		3.178*** (0.672)
Secondary School Enrolment	0.0008 (0.001)	0.002* (0.001)	0.0007 (0.0007)	0.001** (0.0006)	0.070 (0.068)	0.115* (0.065)
Outside Java	-0.057* (0.03)	-0.049 (0.031)	0.006 (0.011)	0.01 (0.012)	2.250 (1.756)	2.872 (1.752)
New Province	0.043* (0.023)	0.084*** (0.024)	0.082*** (0.017)	0.109*** (0.021)	6.934*** (1.534)	8.937*** (1.446)
Budget Deficit	0.017 (0.027)	0.018 (0.028)	-0.004 (0.015)	-0.003 (0.015)	0.415 (1.438)	0.309 (1.424)
Natural Log GDP Per Capita	-0.007 (0.023)	-0.01 (0.026)	0.069*** (0.01)	-0.07*** (0.01)	8.933*** (1.305)	8.714*** (1.345)
Oil Producer	-0.01 (0.014)	-0.032* (0.017)	-0.023** (0.011)	0.038*** (0.012)	-1.199 (1.063)	-2.167** (1.088)
Constant	0.008 (0.42)	1.060*** (0.147)	1.051*** (0.152)	-0.499 (0.464)	154.406** *	154.191** *
Year dummies	Included	Included	Included	Included	Included	Included
Method	OLS	OLS	OLS	OLS	OLS	OLS
Number of Province	33	33	33	33	33	33
Number of Observations	220	220	211	211	224	224
Period	2004- 2010	2004- 2010	2004- 2010	2004- 2010	2004-2010	2004-2010
R-Squared	0.244	0.238	0.483	0.459	0.472	0.481

Appendix B. Robustness Check – Exclude the Natural Log of GDP per Capita**Table B.1: Robustness Check – Exclude the Natural Log of GDP per Capita**

This table presents the results of OLS regressions. The dependent variable is the ratio of credit released by commercial banks located in a province to province's GDP. The values in parentheses are robust standard errors. *, ** and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Bank Loan/ GDP					
	1	2	3	4	5	6
Bureaucracy Index	0.055*** (0.015)	0.06*** (0.017)	0.06*** (0.017)			
Government Index				0.057*** (0.015)	0.057*** (0.016)	0.062*** (0.016)
Human Development Index	0.009*** (0.003)			0.012*** (0.003)		
Poverty		-0.002* (0.001)			-0.002* (0.001)	
Conflict			-0.072*** (0.017)			-0.109*** (0.012)
Outside Java	-0.05* (0.028)	-0.057* (0.03)	-0.056* (0.031)	-0.04 (0.027)	-0.053* (0.030)	-0.047 (0.032)
New Province	0.045* (0.024)	0.037 (0.025)	0.041* (0.024)	0.076*** (0.025)	0.066** (0.027)	0.074*** (0.024)
Budget Deficit	0.018 (0.027)	0.018 (0.027)	0.017 (0.027)	0.018 (0.027)	0.019 (0.027)	0.016 (0.027)
Oil Producer	-0.034** (0.015)	-0.017 (0.015)	-0.012 (0.015)	-0.058*** (0.017)	-0.037** (0.015)	-0.03** (0.015)
Constant	-0.676*** (0.246)	-0.005 (0.097)	-0.026 (0.094)	-0.864*** (0.277)	0.059 (0.084)	0.002 (0.074)
Year dummies	Included	Included	Included	Included	Included	Included
Method	OLS	OLS	OLS	OLS	OLS	OLS
Number of Province	33	33	33	33	33	33
Number of Observations	221	221	221	221	221	221
Period	2004- 2010	2004- 2010	2004- 2010	2004- 2010	2004- 2010	2004- 2010
R-Squared	0.269	0.25	0.259	0.278	0.243	0.267

Table B.2: Robustness Check – Exclude the Natural Log of GDP per Capita

This table presents the results of OLS regressions. The dependent variable is the ratio of commercial bank loans given to micro, small and medium enterprises in a province over the province's GDP. The values in parentheses are robust standard errors. *, ** and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Bank Loan to MSMEs/ GDP					
	1	2	3	4	5	6
Bureaucracy Index	0.032*** (0.01)	0.037*** (0.01)	0.027*** (0.009)			
Government Index				0.027** (0.01)	0.029** (0.012)	0.028*** (0.01)
Human Development Index	0.001 (0.002)			0.003* (0.002)		
Poverty		0.0008 (0.001)			0.0003 (0.001)	
Conflict			-0.085*** (0.015)			-0.101*** (0.014)
Outside Java	0.012 (0.01)	0.01 (0.01)	0.015 (0.011)	0.013 (0.012)	0.009 (0.011)	0.019 (0.012)
New Province	0.085*** (0.013)	0.084*** (0.022)	0.088*** (0.023)	0.102*** (0.026)	0.1*** (0.026)	0.103*** (0.025)
Budget Deficit	-0.002 (0.017)	-0.002 (0.016)	-0.004 (0.017)	-0.001 (0.017)	-0.0006 (0.017)	-0.005 (0.017)
Oil Producer	-0.065*** (0.012)	-0.059*** (0.012)	-0.059*** (0.012)	-0.078*** (0.014)	-0.07*** (0.014)	-0.067*** (0.013)
Constant	-0.081 (0.122)	-0.011 (0.071)	0.057 (0.058)	-0.176 (0.14)	0.062 (0.074)	0.073 (0.058)
Year dummies	Included	Included	Included	Included	Included	Included
Method	OLS	OLS	OLS	OLS	OLS	OLS
Number of Province	33	33	33	33	33	33
Number of Observations	212	212	212	212	212	212
Period	2004- 2010	2004- 2010	2004- 2010	2004- 2010	2004- 2010	2004- 2010
R-Squared	0.33	0.332	0.376	0.313	0.304	0.376

Table B.3: Robustness Check – Exclude the Natural Log of GDP per Capita

This table presents the results of OLS regressions. The dependent variable is the ratio of number of bank branches per million population of the province. The values in parentheses are robust standard errors. *, ** and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Bank Branches/ Population (million)					
	1	2	3	4	5	6
Bureaucracy Index	2.8*** (0.839)	3.788*** (0.963)	4.84*** (1.062)			
Government Index				4.13*** (0.754)	4.339*** (0.875)	4.904*** (0.951)
Human Development Index	1.315*** (0.209)			1.436*** (0.238)		
Poverty		-0.179** (0.077)			-0.21*** (0.078)	
Conflict			4.657** (1.819)			1.36 (1.404)
Outside Java	2.183 (1.971)	0.951 (2.19)	0.603 (2.237)	3.434* (1.791)	1.664 (2.11)	1.32 (2.217)
New Province	7.896*** (1.576)	5.993*** (1.778)	6.343*** (1.49)	10.135*** (1.505)	8.299*** (1.727)	9.193*** (1.627)
Budget Deficit	0.342 (1.624)	0.307 (1.761)	0.477 (1.795)	0.046 (1.552)	0.194 (1.72)	0.38 (1.77)
Oil Producer	1.749* (1.008)	3.755*** (1.185)	4.44*** (1.127)	0.221 (0.926)	2.371** (1.03)	3.067*** (0.981)
Constant	- 97.431*** (17.01)	-5.621 (5.542)	-14.762** (5.912)	- 111.422*** (18.515)	-5.642 (4.664)	- 11.945** (4.692)
Year dummies	Included	Included	Included	Included	Included	Included
Method	OLS	OLS	OLS	OLS	OLS	OLS
Number of Province	33	33	33	33	33	33
Number of Observations	230	225	230	230	225	230
Period	2004- 2010	2004- 2010	2004- 2010	2004-2010	2004- 2010	2004- 2010
R-Squared	0.334	0.238	0.244	0.379	0.259	0.243

Appendix C. Robustness Check – Alternative Measure (Bank Loan/ Population)**Table C.1: Robustness Check – Alternative Measure (Bank Loan/ Population)**

This table presents the results of OLS regressions. The dependent variable is the ratio of bank loans to province's population. The values in parentheses are robust standard errors. *, ** and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Bank Loan/ Population					
	1	2	3	4	5	6
Bureaucracy Index	2.624*** (0.77)	2.722*** (0.794)	2.619*** (0.79)			
Government Index				2.246*** (0.661)	2.151*** (0.681)	2.191*** (0.668)
Human Development Index	0.273** (0.12)			0.459*** (0.144)		
Poverty		-0.048 (0.035)			-0.086** (0.035)	
Conflict			-2.341** (0.992)			-4.092*** (1.061)
Outside Java	-4.918** (1.969)	-5.089** (1.987)	-4.952** (1.978)	-4.773** (1.966)	-5.187** (2.037)	-4.836** (1.984)
New Province	0.024 (0.928)	-0.175 (0.927)	-0.01 (0.954)	1.29* (0.747)	0.912 (0.767)	1.212 (0.774)
Budget Deficit	1.526 (1.675)	1.501 (1.674)	1.469 (1.678)	1.629 (1.708)	1.642 (1.714)	1.536 (1.71)
Natural Log GDP Per Capita	6.32*** (1.634)	6.609*** (1.666)	7.085*** (1.76)	5.999*** (1.602)	6.53*** (1.697)	7.314*** (1.858)
Oil Producer	-1.173 (0.806)	-0.845 (0.759)	-0.933 (0.746)	-2.119** (0.938)	-1.585* (0.852)	-1.711** (0.836)
Constant	129.898** * (31.344)	114.956** * (29.86)	122.867** * (30.952)	134.182** * (32.784)	108.197** * (28.898)	122.601** * (31.6)
Year dummies	Included	Included	Included	Included	Included	Included
Method	OLS	OLS	OLS	OLS	OLS	OLS
Number of Province	33	33	33	33	33	33
Number of Observations	221	221	221	221	221	221
Period	2004-2010	2004-2010	2004-2010	2004-2010	2004-2010	2004-2010
R-Squared	0.417	0.414	0.416	0.407	0.398	0.406

Table C.2: Robustness Check – Alternative Measure (Bank Loan to MSMEs/ Population)

This table presents the results of OLS regressions. The dependent variable is the ratio of bank loans to MSMEs over province's population. The values in parentheses are robust standard errors. *, ** and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Bank Loan to MSMEs/ Population					
	1	2	3	4	5	6
Bureaucracy Index	0.961*** (0.224)	0.987*** (0.228)	0.947*** (0.222)			
Government Index				0.755*** (0.199)	0.684*** (0.21)	0.715*** (0.202)
Human Development Index	0.131*** (0.032)			0.201*** (0.041)		
Poverty		-0.028*** (0.01)			-0.044*** (0.012)	
Conflict			-1.173*** (0.295)			-1.822*** (0.358)
Outside Java	-0.909 (0.556)	-1.011* (0.556)	-0.933* (0.553)	-0.892 (0.553)	-1.117** (0.567)	-0.94* (0.549)
New Province	1.082*** (0.338)	1.015*** (0.348)	1.078*** (0.347)	1.542*** (0.354)	1.427*** (0.379)	1.519*** (0.358)
Budget Deficit	-0.034 (0.41)	-0.045 (0.41)	-0.057 (0.415)	0.007 (0.422)	0.017 (0.426)	-0.023 (0.43)
Natural Log GDP Per Capita	2.027*** (0.44)	2.152*** (0.441)	2.401*** (0.466)	1.949*** (0.437)	2.169*** (0.46)	2.527*** (0.502)
Oil Producer	-0.463* (0.247)	-0.315 (0.249)	-0.354 (0.24)	-0.802*** (0.281)	-0.58** (0.273)	-0.631** (0.262)
Constant	- 43.847*** (7.567)	- 36.186*** (7.411)	- 40.461*** (7.691)	- 45.775*** (8.175)	- 33.943*** (7.341)	- 40.672*** (8.032)
Year dummies	Included	Included	Included	Included	Included	Included
Method	OLS	OLS	OLS	OLS	OLS	OLS
Number of Province	33	33	33	33	33	33
Number of Observations	212	212	212	212	212	212
Period	2004- 2010	2004- 2010	2004- 2010	2004- 2010	2004- 2010	2004- 2010
R-Squared	0.517	0.511	0.516	0.496	0.482	0.494

CONCLUDING CHAPTER

Numerous regulatory changes, as a part of the institutional reforms, have been implemented in the Indonesian banking after the acute 1997/1998 financial crisis to strengthen the resilience of the banking sector and to improve the intermediation performance of banks. The purpose of this dissertation is to analyze the impact of these banking and institutional reforms on the financial intermediation function of Indonesian banks. In particular, we focus on three aspects: 1) the role of political connections in the banking intermediation, 2) the determinants of cost of financial intermediation, and 3) the determinants of banking development.

Thus, in the first chapter of this dissertation, we study the role banks' political connections play in attracting deposits, and whether the type of deposit insurance in place influences this role. We begin by investigating whether banks' political connections effectively impact the supply of funds, whether these connections facilitate access to deposit funding. We find evidence that the supply of funds is higher for politically connected banks compared to their non-politically connected counterparts which indicates political connections are important in attracting deposits. Then, we examine whether this potential added value of being politically connected is different under a blanket guarantee regime and a limited guarantee system. We find that the impact of political connections on the supply of funds (deposits) is stronger after the removal of the guarantee regime

These findings indicate that on the one hand, the implementation of explicit insurance with limited coverage is perceived as credible in excluding uninsured creditors from the guarantee. On the other side, such a change in the regulatory environment leads to the higher value attributed to political connections. The introduction of formal deposit insurance and stronger market discipline might have exacerbated the issue of political connections in the banking sector.

The second chapter deals with the determinants of net interest margins in Indonesia which is relatively so high. First, we focus on the impact of the

structure of loan portfolios in the determination of interest margins. We confirm that small scale loans contribute to increased bank margins, whereas housing (property) loans reduce interest margins. Then, we turn to the effect of banking structure on the margins. Our results show that banks with higher market power “enjoy” higher interest margins. Furthermore, we corroborate the loss leader hypothesis on cross-subsidization of lending and non-interest activities. The results also validate the claim that higher margins are driven by higher operating costs, higher risk aversion and higher liquidity risk. The cost to income ratio is also found to negatively affect intermediation margins. In addition, we find credit risk has a negative impact on bank margins. State-owned banks have higher margins than other banks, while foreign banks and large banks set lower margins.

These findings imply that promoting healthier banking competition in Indonesia specifically to improve transparency and disclosure on banking products has to be bolstered as market power significantly contributes to increase margins. Banks tend to charge a higher margin for small scale loans as the costs and risk of such a loan is quite high. Regulators should therefore direct banks to appropriately estimate risk premia on loans to MSMEs. The higher margins of state-owned banks confirm that these banks are more inefficient that could be explained by the social or political views of government ownership of firms.

In chapter 3, we investigate the determinants of unequal financial deepening across regions in Indonesia. First, we consider that the quality of local government, measured by government and bureaucracy index, as an important aspect to explain the differences in financial development. We strongly find that the quality of local governance is important factor for financial deepening as it ensures that legal institutions are well enforced particularly regarding the creditor/lender rights. Moreover, commercial banks may also be reluctant to establish their business in the poor governance regions because it is quite risky and costly. The other factor which can be considered as the important determinant of financial deepening is the socioeconomic conditions which represent some aspects of

quality of life such as education, poverty, life expectancy, living standards, and unemployment. As expected, our results also show that in the socioeconomically less developed regions, the level of financial deepening is lower than that of more developed regions because banks lack incentives to release credit as the information as well as the quality of borrowers are deficient. Moreover, poor and less-educated people also tend to be reluctant to use bank loans as they perceive that the process of getting loans from banks is complicated.

Based on these findings, improving local governance, particularly for regions having poor governance, should be encouraged to facilitate a favorable business environment and to provide incentives for banks to expand their business more specifically in granting loans. Regulators also have to reconsider regulations that have naturally created a barrier to financial deepening especially on the income of borrowers.

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Résumé

Dans le premier chapitre de cette thèse, en se basant sur les données des banques indonésiennes, nous examinons l'impacte des connections politiques d'une banque sur sa capacité à collecter des dépôts sous différents systèmes d'assurance de dépôt. Nous constatons qu'indépendamment du type de la banque (banque privée ou banque détenue par l'état), les banques connectées politiquement attirent plus facilement les dépôts. Nous montrons également que cet effet est plus prononcé après la mise en œuvre du régime d'assurance-dépôts à couverture limitée.

Dans le chapitre 2, nous analysons les déterminants de la marge nette d'intérêts des banques indonésiennes après la crise financière 1997/1998. Nos résultats prouvent que la structure des portefeuilles de prêts compte dans la détermination des marges d'intérêt. Les coûts d'exploitation, le pouvoir du marché, l'aversion au risque et le risque de liquidité ont tous un impact positif sur les marges d'intérêt. Le risque de crédit et le ratio du coût par rapport au revenu sont négativement associés aux marges. Nos résultats réaffirment l'hypothèse du « *loss leader* » sur les subventions croisées entre les activités d'intermédiation traditionnelles et les activités de services. Les banques publiques fixent des marges d'intérêt plus élevées que les autres banques, tandis que les marges sont plus faibles pour les grandes banques et les banques étrangères.

Dans le chapitre 3, nous étudions les déterminants de l'approfondissement du secteur financier pour les régions de l'Indonésie suite aux réformes institutionnelles amenant le pays à devenir plus décentralisé. Nous constatons qu'une mauvaise gouvernance locale limite considérablement l'approfondissement financier. Nos résultats permettent de conclure que dans les régions les moins développées socio économiquement, le niveau de l'approfondissement financier est inférieur à celui des régions plus développées.

Mots clés: Connections politiques, Assurance des dépôts, Marge nette d'intérêts, Approfondissement financier, Indonésie

Abstract

In chapter 1 of this dissertation, we investigate the impact of banks' political connections on their ability to collect deposits under two different deposit insurance regimes (blanket guarantee and limited guarantee) using data for Indonesian banks. We find that, regardless of their type (state-owned or private entities), politically connected banks are able to attract deposits more easily than their non-connected counterparts. We also show that this effect is more pronounced after the implementation of formal deposit insurance with limited coverage.

In chapter 2, we analyze the determinants of net interest margins of Indonesian banks after the 1997/1998 financial crisis. Our results confirm that the structure of loan portfolios matters in the determination of interest margins. Operating costs, market power, risk aversion and liquidity risk have positive impacts on interest margins, while credit risk and cost to income ratio are negatively associated with margins. Our results also corroborate the loss leader hypothesis on cross-subsidization between traditional interest activities and non-interest activities. State-owned banks set higher interest margins than other banks, while margins are lower for large banks and for foreign banks.

In chapter 3, we investigate the determinants of financial deepening across regions in Indonesia after the institutional reforms which brought the country to become more decentralized. We find that poor local governance significantly impedes financial deepening. Our results also conclude that in the socioeconomically less developed regions, the level of financial deepening is lower than that of more developed regions.

Key words: Political Connections, Deposit Insurance, Net Interest Margins, Financial Deepening, Indonesia