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Loan Portfolio Structures, Risk and Performance of Different Bank Ownership Types: An Indonesian Case

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DECLARATION

To the best of my knowledge and belief this thesis contains no material previously published by any other person except where due acknowledgment has been made.

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university.

Signature : 

Date : 31 October 2014

This Thesis is dedicated for my loved one who already passed away:

- *My Dad: Kalikit Ngandj, for laying a solid foundation of Christian faith and love for knowledge. His life has been example of a lifelong commitment and dedication in education. I treasure every moment I spent with him in those twelve precious years.*

- *My Father in law: Johanis Umbu Riada and My Mother in law: Rambu Moha, for their trust and full support on my career as an academic*.

"The memory of those we love, remains in our heart forever"

At the end of life, what really matters is not what we bought
But what we built;
Not what we got, but what we shared;
Not our competence, but our character;
And not our successs, but our significance
Live a life that matters……
(Author unknown)

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"Trust in the Lord with all your heart, and lean not on your own understanding; in all your ways acknowledge Him, and He shall direct your paths." (Proverbs 3:5-6)

"New mercies every morning,
Grace for every day,
New hope for every trial,
And courage all the way."(McVeigh)

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“***But those who hope in the Lord will renew their strength. They will soar on wings like eagles; they will run and not grow weary, they will walk and not be faint***” ***(Isaiah 40:31)***

ABSTRACT

After being severely affected by the 1997 Asian financial crisis, Indonesia implemented banking industry reforms that included changes in bank ownership structures and spheres of activity. The country's central bank, Bank Indonesia, also introduced extensive prudential regulations concerning bank lending practices. These changes may have had meaningful impacts on the loan portfolio structures and performances of banks with different ownership structures.

The objective of this study is to examine the loan portfolio structures, risks and performance of different bank ownership types in Indonesia over the period 2003-2011 to:

- Determine the changes and differences in the loan portfolio compositions and concentrations of the various ownership types of Indonesian commercial banks and changes and differences in their loan portfolio risks and returns; and
- Determine the impacts of bank ownership type, loan portfolio concentration and risk on the returns of loan portfolios over the period 2003-2011.

The literature review focuses on previous research concerning banks' ownership types, loan portfolio concentration, risk and performance and provides an overview of Indonesian banking regulations and changes before, during and after the Asian financial crisis. The literature review provides evidence of dissimilarities in the compositions and performances of loan portfolios with respect to bank ownership type. It also reports previous findings indicating that loan portfolio diversification does not necessarily lead to improved risk-return relationships and that focussed portfolios may perform better than other types of portfolios in certain environments. The overview of Indonesian banking industry regulations covers the period from 1967 to 2011 with a focus on banking ownership structures and loan portfolio regulations.

Although comprehensive studies have examined the relationship between bank ownership type and bank performance, these studies did not consider loan portfolio composition in terms of product types or sectoral market segments. This study extends the previous research to determine the impacts of ownership type, loan

portfolio structure and loan portfolio risk on banks' loan portfolio performance. To the best of the author's knowledge, no such research has been conducted to date in Indonesia, despite the fact that the country underwent massive banking reform in the wake of the devastating 1997/1998 financial crisis.

The research methodology includes a descriptive, univariate and multivariate data analysis of 109 Indonesian commercial banks over the period from 2003 to 2011 (with a total of 981 observations). Descriptive statistics are applied to provide an understanding of trends and deviations in the data. Univariate analyses are performed in the tests of means for bank ownership types across years and for years across bank ownership types with respect to loan portfolio concentration, risk and return. Finally, multivariate analyses are conducted to determine the factors affecting loan portfolio return. These latter analyses consist of a multiple regression approach for key years (2003, 2007 and 2011) and a fixed-effects panel data regression approach for the 2003 to 2011 period.

The combined findings of the univariate and multivariate analysis in this study reveal that different bank ownership types (government-owned banks, domestic-owned banks and foreign-owned banks) in Indonesia differ with respect to loan portfolio structure (composition and concentration) and risk. These differences result in different loan portfolio returns.

Because bank ownership type is one of the factors affecting Indonesian bank loan portfolios, it is important for Bank Indonesia, as the country's central bank, to consider differences in ownership type when developing or changing credit regulations. Bank Indonesia's requirement for foreign-owned banks to direct loans to specific sectors, as established by the government in Bank Indonesia regulation No. 14/8/PBI/2012 and Bank Indonesia circular letter No. 15/4/DPNP, already contributes to the development of different sectors. However, this effort could be enhanced by developing similar requirements for other bank types. There is evidence that government-owned banks do not serve as "government agencies" in targeting specific market segments for economic development. The findings of this thesis suggest that specific sectors facing infrastructural economic development liabilities may require more direct financing from government-owned banks as the major player in the banking industry. Focussing on sectors that contribute more

substantially than others to infrastructure and international trade may provide more long-term economic success.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

GLOSSARY OF KEY ABBREVIATIONS

Agri	Agriculture, Hunting and Agricultural facilities
Bus_Serv	Business Services
CAR	Capital Adequacy Ratio
CEO	Chief Executive Officer
C&I	Commercial & Industrial
Constr	Construction
Csmt	Consumption
DBs	Domestic-owned Banks
EHHI	Loan Portfolio Concentration Based on Economic Sector
Elec	Electricity, Gas and Water
FBs	Foreign-owned Banks
GBs	Government-owned Banks
GDP	Gross Domestic Product
GFC	Global Financial Crisis
HHI	Herfindahl-Hirschman Index
IBRA	Indonesian Banking Restructuring Agency
IDR	Indonesian Rupiah
IFRS	International Financial Reporting Standards
Invt	Investment
IRB	Internal Rating Based
LDR	Loan to Deposit Ratio
LInt	Loan Interest Income
LPPI	Lembaga Pengembangan Perbankan Indonesia (Indonesian Banking Development Institute)
Manuf	Manufacturing
Mining	Mining
NPL	Non-Performing Loans
OJK	Otorita Jasa Keuangan (Financial Service Authority)
OLS	Ordinary Least Square
RAROC	Risk Adjusted Return on Capital
SBI	Sertifikat Bank Indonesia
Soc_Serv	Social Services
Trade	Trade, Restaurants and Hotels
Transp	Transportation, Warehousing and Communications
THHI	Loan Portfolio Concentration Based on Loan Types
US GAAP	United States Generally Accepted Accounting Principles
VIF	Variance Inflation Factor
WC	Working Capital

RELATED THESIS PUBLICATIONS

Refereed Journal

Atahau, A.D.R. and Cronje, T (2014) Loan Portfolio Structure and Performance of Government-owned Banks in Indonesia: Does Size Matter? Corporate Ownership & Control 11 (4): 379-390

Refereed Conference Papers

Atahau, A.D.R (2013) Loan Portfolio Composition of Indonesian Banks: Does Ownership Matter? Higher Degree by Research Students Colloquium Proceedings, Curtin Business School, Curtin University, 1-2 October 2013

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Chapter 1
INTRODUCTION

1.1 Background

Banks perform numerous roles in the economy. Although their most common role is to act as intermediaries between savers and borrowers (Patrick, 2001), banks also facilitate payment systems, underwrite securities, ameliorate asymmetric information problems, balance inter-temporal risk and contribute to economic growth (Tandelilin et al., 2007, Allen and Carletti, 2008). Banks' role in the macro-environment is also confirmed by Laeven and Levine (2009), who indicate that banks affect a country's levels of economic fragility, business-sector fluctuations and economic growth.

The collapse of Indonesia's banking system during the Asian financial crisis was devastating (Batunanggar, 2002). According to Pangestu (2003), the crisis was primarily caused by weak domestic economic and financial structures, as implied by weaknesses in banks' corporate governance. Alijoyo et al. (2004) suggest that the two major problems concerning corporate governance in the banking sector were the weak supervision of the central bank, Bank Indonesia, and the violations by banks of banking regulations.

Because the country was significantly affected by the 1997 financial crisis, many Indonesian banks were not financially able to recapitalise (Montgomery, 2003). In 1999, the government closed 38 banks and placed these banks' assets under the management of the Indonesian Bank Restructuring Agency (IBRA). According to Lukviarman (2010), the government took over seven banks, and the remaining 73 banks remained open despite their low capital adequacy ratios (CARs) and high levels of non-performing loans (NPLs). Therefore, in an effort to restabilise the banking industry, Indonesia increased the limit of foreign ownership allowed in domestic banks to 99% through the enactment of government regulation (Peraturan Pemerintah) number 29/1999 (Republik Indonesia, 1999a). This action was followed by the termination of the restrictions on the number of foreign-owned bank branches in Indonesia by a decree of the Bank Indonesia director, specifically No.

32/37/KEP/DIR/1999[1] (Hadad et al., 2004), and by a Bank Indonesia regulation (2/27/PBI/2000) that abolished the restrictions preventing foreign-owned banks from financing export loans (Bank Indonesia, 1999, Bank Indonesia, 2000). Foreign-owned banks were allowed to operate branches, subsidiaries (through direct investment or capital market investment) and representative offices and to conduct business analogously to domestic banks. The majority of foreign-owned banks chose to acquire shares in existing domestic-owned banks rather than establish new branches (Goeltom, 2005). Further, Goeltom (2005) reported that the regulatory liberalisation increased the role of foreign-owned banks in Indonesia, as shown by a significant increase in their aggregate assets from 7.74% in 1996 to 12.75% in 2004. In addition, the Indonesian government actively began privatising its state-owned banks in 2002 by selling shares of these banks to the private sector, although the privatisation did not substantially improve bank performance (Goeltom, 2005, Harada and Ito, 2006).

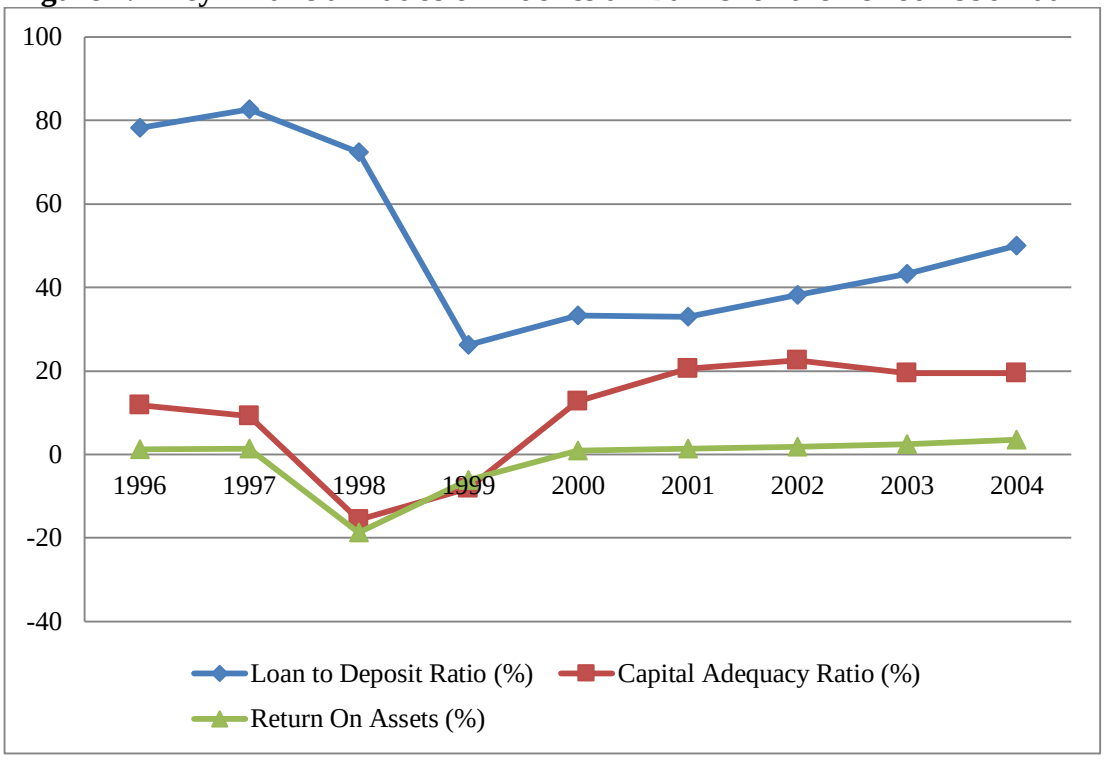
Before the crisis, the dominant banking industry players in Indonesia were the seven state-owned banks[2], which accounted for a 50% aggregate share of the bank market measured by assets (Patrick, 2001, Kameyama et al., 2005). In addition, before the crisis, the large Indonesian state-owned banks and some of the domestic-owned banks were affiliated with other banks and financial institutions through cross-shareholding and management. Kameyama et al. (2005) suggest that during this pre-crisis period, state-owned and domestic-owned banks were characterised by the following practices: domination by conglomerates, violations of legal lending limits, lending directed toward firms belonging to the same group, political intervention by state-owned banks, inappropriate credit evaluation and analysis, inefficient banking practices and weak risk management. During this period, loans with high limits were granted without proper evaluation. This practice increased the level of non-performing loans, which were subject to minimal monitoring by Bank Indonesia (Pangestu, 2003). The major banks continued their massive expansion of loans without prudent lending policies, which exacerbated the problem of illiquidity and

[1] The Bank Indonesia regulation issued in the following year (2/27/PBI/2000) provides a level playing field for all types of banks. Since then, the requirement restricting foreign-owned banks to financing export loans was also abolished.

[2] State-owned banks are banks owned by the Indonesian central government. The other group of government-owned banks are the regional development banks that are owned by different local/provincial governments in Indonesia.

insolvency based on credit default (Alijoyo et al., 2004). The graph below depicts the key financial ratios of Indonesian banks during the 1996-2004 period.

Figure 1.1 Key Financial Ratios of Indonesian Banks for the Period 1996-2004



Source: Banking Statistics of Bank Indonesia (1996-2004)

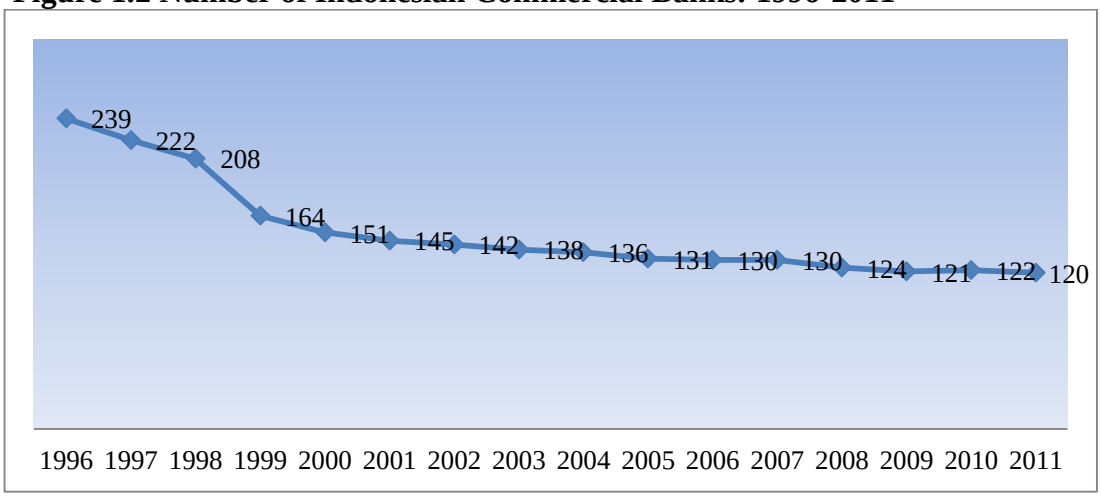
From the graph, it is clear that the loan to deposit ratio (LDR), capital adequacy ratio (CAR)[3], and return on assets (ROA) were significantly affected during the crisis period.

The financial crisis led to massive bank restructuring with the assistance of the International Monetary Fund and the World Bank. The restructuring consisted of the closure of insolvent institutions, the provision of overdraft facilities as liquidity support for commercial banks, the establishment of the Indonesian Bank Restructuring Agency, the merging and privatisation of state-owned banks, the relaxation of the limitations on the private ownership of banks, and the inclusion of external auditing by overseas auditors (Harada and Ito, 2006, Hadad et al., 2011). As a result, the number of commercial banks in Indonesia decreased from 229 before the crisis to 152 in 1999, further decreasing to 136 banks by October 2004 (Kameyama

[3] Measurement of CAR according to Indonesian Banking Statistics= (Tier 1+Tier 2 Capital)/Risk weighted assets based on Bank Indonesia Circular Letter Number 30/2/UPPB on April 30, 1997

et al., 2005). The downward trend in the number of commercial banks over the period 1996 to 2011 is reflected in the graph below:

Figure 1.2 Number of Indonesian Commercial Banks: 1996-2011



Source: Banking Statistics of Bank Indonesia (1996-2011)

The massive restructuring of the Indonesian banking industry not only reduced the number of banks but also caused changes in bank ownership types; notably, the number of banks with government and domestic ownership decreased, whereas the number of banks with foreign ownership increased. After the privatisation of state-owned banks, the market share of the remaining state-owned banks decreased (Hadad et al., 2011).

As intermediary institutions, banks play an important role by providing funds to borrowers. However, banks' ownership structures affect their credit portfolios. This relation is confirmed by De-Haas et al. (2010), who suggest that bank loan portfolios are determined by bank characteristics such as ownership and size. Using ordinary least squares regression, a study by De-Haas et al. (2010) confirmed differences in loan portfolio composition across bank ownership types based on the analysis of 220 banks in 20 transition countries. The study used several loan-type variables, including mortgages and other consumer lending, and customer categories, including small and medium enterprises, large enterprises, and state-owned enterprises. The results indicated that state-owned banks lend larger amounts to state-owned enterprises than do domestic- and foreign-owned banks. Foreign-owned banks tend to focus on mortgage lending and lending to the subsidiaries of international firms, limiting their focus on foreign clients to the corporate segment.

Other research findings concerning loan portfolios also highlight the importance of bank ownership. Berger et al. (2005) suggest that changes in loan portfolio composition can be associated with ownership changes; Laeven and Levine (2009) indicate that the extent of bank loan portfolio risk-taking is linked with a bank's ownership structure; and Degryse et al. (2012) report differences in the loan portfolio composition across bank ownership types based on data from 110 Polish banks.

1.2 Problem Statement

Based on the aforementioned research concerning the relationship between loan portfolio composition and bank ownership, this study assumes that the massive restructuring of the banking industry in Indonesia, which included changes in the ownership types of many banks, may have affected banks' loan portfolio composition choices. Notably, no previous study to date has empirically assessed the impact of bank ownership type on loan portfolio composition in Indonesia, despite the following considerations: Indonesia underwent massive banking reform following the devastating 1997/1998 financial crisis; and credit risk represents a major loan portfolio risk (Hammes and Shapiro, 2001, Goeltom, 2005). Although researchers such as Mian (2003), Bonin et al. (2005), Berger et al. (2005), and Micco et al. (2007) have conducted comprehensive studies on the impact of bank ownership type on bank performance in other countries, these analyses were not based on different loan portfolio compositions such as products or sectoral market segments. In addition, previous research did not associate portfolio composition with loan portfolio risk and return.

1.3 Research Objectives

The objective of this study is to examine the loan portfolio structures, risks and performances of banks with different ownership types in Indonesia over the period 2003-2011 to:

- Determine the changes and differences in the loan portfolio composition and concentration across Indonesian commercial bank ownership types and the changes and differences in their loan portfolio risks and returns; and

- Determine the impact of different bank ownership types, loan portfolio concentrations and risk on the return of such portfolios over the period 2003-2011.

1.4 Significance

To date, no study has examined bank ownership structures in Indonesia and the differences in their loan portfolio structures, risk and performance. This research will have both theoretical and practical significance.

1.4.1 Theoretical Significance

This research advances the available body of knowledge by providing findings concerning the differences in the loan portfolio structures, risk and performance of commercial banks by ownership type in Indonesia and by providing empirical research on the topic. The analysis is based on bank-level information from the annual reports of banks and the Indonesian Banking Directory. This research therefore provides evidence of the similarities and differences in the loan portfolio structures, risk and performance of government-owned, domestic-owned and foreign-owned banks in Indonesia after the bank restructuring that followed the devastating effects of the Asian financial crisis. It also serves as longitudinal evidence of how the bank restructuring and privatisation scheme changed the pre-crisis characteristics and operations of Indonesian government-owned and domestic-owned banks, as described by Kameyama et al. (2005), Harada and Ito (2006), and Hadad et al. (2011).

1.4.2 Practical Significance

The research may improve and/or enhance the efficiency of several key banking elements, as follows:

- The Indonesian central bank: by providing findings that may assist in the formulation of policies regarding loan allocations concerning the differences in the loan portfolio concentration and the risk of Indonesian government-owned banks, domestic-owned banks and foreign-owned banks;

- Banks: by improving their loan portfolio strategy based on the risk and return findings and recommendations of this research;
- The Indonesian government: by providing information that can be used for implementing policy changes and measures to enhance necessary financial intermediation in sectors of the economy in which inadequacies exist or specific growth is required.

1.5 Scope of the Study and Research Methodology

The study includes a literature review and empirical research based on the objectives stated above. The literature review addresses the different types of bank ownership classification methods developed and applied in the literature; research findings concerning different bank ownership types; bank loan portfolio composition and performance; the relationship between bank ownership types and loan portfolios; and the gap between existing knowledge and research.

This study covers the period from 2003 to 2011, encompassing the post–Asian financial crisis period from 2003 to the onset of the global financial crisis (GFC) in 2007 and the post-GFC situation from 2007 onwards.

The key years of 2003, 2007 and 2011 enable specific comparisons of differences and changes over the periods 2003 to 2007 (post-Asian crisis and pre-GFC period) and 2007 to 2011 (GFC and post-GFC period) and the entire 2003 to 2011 period.

The empirical research is based on financial information (balance sheets, income statements, financial ratios and notes to financial statements) and non-financial information (ownership of individual banks) pertaining to all commercial banks (excluding Islamic banks) in Indonesia from 2003 to 2011. The notes regarding the financial statements of each bank provide detailed information on the loan allocations to different economic sectors, the loan types issued by the banks and the interest income from loans. The number of banks selected is 109, with a total of 981 observations (109 banks over 9 years).

The data analysis begins with descriptive statistics of all of the variables for each of the three key years (2003, 2007, 2011) to obtain an understanding of the trends in the data and the extent of deviations. Next, univariate statistical analysis is conducted to

assess the change in each variable over the nine-year period within the context of the 2003-2007 post-Asian crisis and pre-GFC period, the 2007-2011 post-GFC period and the full 2003-2011 period. The analysis also examines differences in loan portfolio concentration, loan repayment default risk and loan portfolio returns across the three bank ownership types. Finally, this research uses multivariate statistics to determine the impact of different bank ownership types, their loan portfolio concentrations and loan repayment default risk on their loan portfolio returns. The tests involve the use of multiple regression and panel data regression.

1.6 Presentation of the Research

This thesis consists of six chapters. The literature review is conducted in Chapters 2 and 3. Chapter 4 contains the empirical research methodology applied in this study. The research findings are presented in Chapter 5. Chapter 6 concludes the research and provides recommendations for future research.

Chapter 2

BANK OWNERSHIP AND LOAN PORTFOLIOS

2.1 Introduction

In the previous chapter, the purpose of the thesis, the research objectives, and the significance of the study were outlined. This chapter draws on extracts from various journal papers and books to scrutinise the theory and research conducted on bank ownership, loan portfolios and performance and to provide a comprehensive overview of existing knowledge and research relating to these aspects.

The first section of this chapter focuses on the classification methods developed and applied in the literature for different types of bank ownership, followed by research findings on the subject. The second section addresses bank loan portfolio composition and performance, followed by a discussion of the relationship between bank ownership types and loan portfolios. The chapter concludes by identifying the gap between existing knowledge and research and by suggesting how the contributions of this study can enhance the level and spectrum of research.

2.2 Bank Ownership

Banks are classified based on aspects such as differences in ownership, legislation, services provided, and market segments served (Cronje, 2013). For ownership classification purposes, the frequently used terms in the banking literature are bank ownership structures and bank ownership types. Although both terms intend to distinguish banks based on the parties controlling them (Tandelilin et al., 2007, Iannotta et al., 2007), the terms are used in different contexts. Researchers generally use the term bank ownership type to classify banks as government-, domestic-, and foreign-owned banks in the context of studies on how ownership types differ with respect to activities, risk-taking behaviour and performance. Conversely, bank ownership structure refers to the proportional dispersion of shares with an emphasis on the direct and indirect control of activities by shareholders. In this research, the term bank ownership types will be used because the term is better aligned with the

objective and context of this research based on the abovementioned explanation of Tandelilin et al. (2007) and Iannotta et al. (2007).

2.2.1 Different Types of Bank Ownership

Researchers such as Mian (2003), Berger et al. (2005), Micco et al. (2007), Beck et al. (2011), and Taboada (2011) classify banks into three groups, namely, foreign-, domestic- and government-owned banks. Certain researchers, such as Bonin et al. (2005), Tandelilin et al. (2007), and Haw et al. (2010), employ a more detailed classification by dividing the major groups of foreign-, domestic- or government-owned banks into sub-categories. Notwithstanding this more detailed classification, it is evident from Table 2.1 that the major bank ownership type classification is foreign-, domestic- and government-owned banks. Whereas certain researchers focus on individual types of ownership, classified as foreign-, domestic-, or government-owned,[4] other researchers combine foreign, domestic and government banks in their research (Clarke et al., 2001a, Chen and Liao, 2011)

The classification used by researchers is based on equity ownership thresholds. [5] For example, a bank is classified as a government bank if the portion of shares owned by the government exceeds 50% (Mian, 2003, Barth et al., 2004, Micco et al., 2007, Berger et al., 2010) or is above a certain threshold such as 20% (La-Porta et al., 2002, Dinc, 2005, Haw et al., 2010, Taboada, 2011).The same principles are applied to domestic and foreign banks. For example, Claessens and Horen (2012) use 50% foreign ownership as the criterion for classifying a bank as foreign. The various thresholds that researchers apply are generally based on accounting standards, wherein ownership exceeding 20% is considered significant, whereas ownership exceeding 50% is regarded as dominant (Kieso et al., 2010). Moreover, the International Financial Reporting Standards (IFRS) and the US Generally Accepted Accounting Principles (US GAAP) regard ownership exceeding 50% as controlling ownership (Shehzad et al., 2010).

[4] These authors include Clarke et al., 2001a, Clarke et al., 2001b, La-Porta et al., 2002, Unite and Sullivan, 2003, Sapienza, 2004, Dinc, 2005, Giannetti and Ongena, 2005, Mian, 2006, Detragiache et al., 2008, Cull and Peria, 2010, Giannetti and Ongena, 2012, Claessens and Horen, 2012.

[5] Stated differently, Mian (2003) describes the basis of the classification as the "identity of who owns the cash flow (ownership) and control rights of the banks".

Several authors also use the formal classification from the central banks of countries as the basis of categorisation (Sapienza, 2004, Berger et al., 2005, Mian, 2006).

Table 2.1 below reports the various bank ownership type classifications applied in studies conducted by various researchers.

Table 2.1 Bank Ownership Types: Categorisation and Criteria

No	Author and Year	Categorisation	Criteria	Samples and Period
1	Clarke et al. (2001)	Foreign Banks	Foreign Banks: if more than 50% of assets are foreign owned	38 developing and transition countries, 1998
2	Claessens et al. (2001)	Foreign Banks Domestic Banks	Foreign Banks: if foreigners have at least 50% ownership	80 countries, 1988-1995
3	La Porta et al. (2002)	Government Banks	Government Banks: if more than 20% of assets are government owned	92 countries in the world, 1970-1995
4	Montgomery (2003)	Foreign Banks	Foreign Banks: if foreigners hold more than 50% of total bank equity	Four countries most affected by Asian crisis in 1997: Indonesia, Malaysia, Korea and Thailand, 1998-2002
5	Mian (2003)	Foreign Banks Private Domestic Banks Government Banks	Government Banks: if a controlling percentage (more than 50%) of the shares is held by government	100 emerging economies, 1992-1999
6	Unite & Sullivan (2003)	Foreign Ownership	Foreign Ownership: Percentage of foreign ownership	The Philippines, 1990-1998
7	Barth et.al (2004)	Government-owned banks	Government Banks: if 50% or more of bank assets are government owned	107 countries, 1999
8	Sapienza (2004)	State-owned banks Private banks	Government Banks: if classified as government banks according to Bank of Italy legal classification prior to 1990	Italy, 1991-1995
9	Berger et al. (2005)	Domestic Ownership Foreign Ownership State ownership	Domestic Ownership: if assigned as domestic banks by Banco Central de la República Argentina (BCRA)	Argentina, 1990s
10	Bonin et al. (2005)	Majority Government Ownership Majority Domestic Private Ownership Strategic Foreign Ownership (single majority owner/ single controlling owner) Other Foreign Majority Ownership	Strategic Foreign Ownership: if foreign owners together hold more than 50% of the shares	11 advanced transition countries, 1996-2000

Table 2.1 Bank Ownership Types: Categorisation and Criteria (continued)

No	Author and Year	Categorisation	Criteria	Samples and Period
11	Dinc (2005)	Government Banks	Government Banks: if government ownership is at least 20%	36 countries in the world (19 emerging markets and 17 developed economies), 1994-2000
12	Giannetti and Ongena (2005)	Foreign Banks	Foreign Banks: if foreign individuals, corporations, financial institutions or even foreign governments combined owned more than 50% shares	14 Eastern European transition countries,1993-2002
13	Laeven and Levine (2006)	State Banks Family (individual) Other Shareholders Widely held	Government Banks: if government is the controlling owner (holds voting rights of more than 10%)	48 countries, 2001
14	Mian (2006)	Foreign Banks Domestic Banks	Foreign Banks: if classified as foreign by State Bank of Pakistan	Pakistan, 1996-2002
15	Iannotta et al. (2007)	Government owned Banks Mutual owned Banks Private owned Banks	Government Banks: If a national or local government is the banks ultimate owner (owns more than 24.9% of bank's equity capital)	15 European countries, 1999-2004
16	Micco et al.(2007)	Domestic Private Banks Public Banks Foreign Banks	Foreign Banks: if foreigners owned more than 50% of shares Public Banks: if public sector ownership is above 50%	179 countries around the world, 1995-2002
17	Tandelilin et al. (2007)	Foreign-owned Banks Joint Venture-owned Banks Private Domestic-owned Banks State-owned Banks	Foreign Banks: if majority shareholders are foreigners	Indonesia, 1999-2004
18	Detragiache et al. (2008)	Foreign Banks	Foreign Banks: if more than 50% capital is in the hands of non-residents	89 Poor countries (low income and lower middle income), 1995-2002
19	Cull and Peria (2010)	Foreign Banks	Foreign Banks: if share of banking sector assets held by foreigners is more than 50%	100 developing countries, 1995-2002

Table 2.1 Bank Ownership Types: Categorisation and Criteria (continued)

No	Author and Year	Categorisation	Criteria	Samples and Period
20	De-Haas et al. (2010)	Greenfield Foreign Banks Privatised Foreign Banks State Banks Private Domestic Banks	Greenfield Foreign Banks: Foreign bank subsidiaries that have been newly established by parent banks	20 transition countries, 2005
21	Haw et al. (2010)	Family Banks State Banks Widely held corporations Financial Institutions Miscellaneous: Unlisted companies, cross-holdings, etc	State (Government Banks): if state owns 20% or more of control rights	9 East Asia and 13 Western European countries, 1990-1996
22	Beck et al. (2011)	Foreign Banks Domestic Private Banks Government-owned Banks	Foreign Banks: if the owners are foreigners	45 countries (38 developing and 7 developed), 2007
23	Chen and Liao (2011)	Foreign Banks Domestic Banks	Foreign Banks: if foreigners own shares of more than 50%	70 countries, 1992-2006
24	Taboada (2011)	Government-owned banks Foreign-owned banks Domestic-owned banks	Government Banks: if government equity ownership exceeds 20% threshold	63 countries around the world, 1995 and 2005
25	Claessens and Horen, 2012	Foreign Banks	Foreign Banks: if more than 50% shares are owned by foreigners	137 countries, 1995-2009
26	Degryse et al. (2012)	State owned banks Foreign (takeover) banks Foreign (greenfield) banks	Foreign (take-over) banks: if more than 50% of the banks has been acquired by foreign investors	Poland, December 1996- December 2006
27	Giannetti and Ongena (2012)	Foreign Banks	Foreign Banks: if foreign individuals, corporations, financial institutions or government combined owned more than 50% of the bank	13 Eastern European economies, 2000 and 2005

Despite similar bank ownership types, the fourth column of Table 2.1 shows that the criteria used to classify bank types differ. For example, Detragiache et al. (2008) use a broad description of non-residents as foreigners, whereas Giannetti and Ongena (2012) provide a more detailed description of foreign entities. Considering the aforementioned differences in the specific shareholder thresholds and criteria used to describe different groups of shareholders, the bank type classifications applied by different researchers can, to a certain extent, be considered similar; however, their

findings may not be directly comparable because of differences in classification criteria.

Agency, social and political theories form the basis for the majority of research on different bank ownership types presented in Table 2.1. Agency theory is the most prominently addressed in the literature. Jensen and Meckling (1976) suggest that the essence of agency theory is the conflict between the goals of owners (principals) and those of managers (agents) when they engage in a cooperative effort bound by contract. The severity of a conflict depends on whether the cash flow right (ownership) and the control right reside with the same or different parties.

Agency conflicts are more severe in the case of government-owned banks because the cash flow rights and the control rights always reside with different parties (Shleifer and Vishny, 1997, Sapienza, 2004). The cash flow rights reside with the public (taxpayers), whereas the control rights are in the hands of government bureaucrats. As a result, the bureaucrats, as agents, have weak incentives to serve the interests of the taxpayers (the shareholders). Agency conflict is less common among private domestic-owned banks because the domestic shareholders possess both the cash flow and control rights (Mian, 2003). The condition is similar for foreign-owned banks, in which foreign shareholders hold both the cash flow and control rights. Both domestic-owned and foreign-owned banks operate their businesses based on the profit maximisation principle and expect their bank managers, acting as their agents, to pursue shareholder interests (Berger et al., 2005).

Conversely, government-owned banks, particularly in developing countries (Mian, 2003) and poorer countries (Barth et al., 2001), base their business on social and political motives, as indicated by La-Porta et al. (2002) and Sapienza (2004). It is evident that social and political theories are intertwined and thereby underpin government-bank ownership. In this regard, social theory relates to the government function of improving economic welfare. According to La-Porta et al. (2002), a major proponent of social theory is Russian economist Alexander Gerschenkron, whose 1962 study emphasises the importance of government presence in financial markets to channel funds to certain industries not served by private banks. Other supporters of this theory include Atkinson and Stiglitz (1980), Sapienza (2004) and Shleifer and Vishny (1997), who base their support on the economic theory of

institutions (institutional economics) and affirm the need for government-owned banks to contribute to economic development and improve social welfare.

According to political theory, government control of enterprises and banks is based on motives to obtain votes, political contributions and bribes (La-Porta et al., 2002). Shleifer and Vishny (1994), quoted in Sapienza (2004), suggest that state-owned enterprises (including government-owned banks) are frequently used as tools to pursue the individual goals of politicians, including the creation of new employment opportunities. Berger et al. (2005) suggest that it is common practice for government-owned banks to apply directed lending for political purposes rather than for profit-maximisation purposes. Interestingly, numerous studies confirm this political view (Barth et al., 2001, La-Porta et al., 2002, Barth et al., 2004, Sapienza, 2004, Dinc, 2005, Micco and Panizza, 2006). Dinc (2005) reports that government-owned banks are more lenient with respect to loan defaults, loan restructuring and the issuance of new loans in election years to enable politicians to reward their supporters. The findings of Mian (2003) also support the agency and political theories regarding reckless lending decisions based on poor incentives, political intervention and moral hazard behaviour by the bureaucrats who serve as the managers of government-owned banks.

Unlike government-owned banks, foreign-owned banks are generally established when they follow their home country's multinational customers and/or pursue opportunities in host countries (Cull and Martinez Peria, 2010)[6]. Foreign-owned banks often expand their presence to non-local geographical areas by either acquiring "domestic institutions with extensive branch networks" or by establishing "isolated representative offices aimed at serving niche market segments" (Cerutti et al. (2007) 1670). Purchasing branch networks represents a way of establishing a subsidiary that can conduct business similar to all other banks in the non-local geographical area. In the majority of cases, host country regulations do not permit offices or branches that are not registered as full subsidiaries to conduct all bank activities. Based on Cerutti et al. (2007), who study Latin America and Eastern Europe, branch establishment is the preferred method when host country taxes are high and foreign banks do not

[6] Another reason relates to institutional and regulatory similarities between the parent bank country of origin and its subsidiary (foreign branch) country. In some cases, economic and cultural bounds between home and host countries serve as another consideration (Cull and Peria, 2010)

target retail segments. [7] In essence, the choice between branches or subsidiaries largely depends on a parent bank's desired activity in a foreign country. In a host country in which there is a substantial possibility of expropriation, foreign banks prefer branches to subsidiaries.

By relaxing the regulations regarding foreign bank entry and operation, many countries have facilitated the establishment of foreign banks. Advances in technology, the integration of financial systems and increased liberalisation also have driven foreign bank presence in many countries (Claessens and Horen, 2012). Both the presence and the significant role of foreign banks have increased in many middle-income and developing countries such as Hungary, Poland, Chile, and Argentina because of the financial liberalisation that has been occurring for more than twenty years (Clarke et al., 2001b, Cerutti et al., 2007).

Neoclassical theory on financial integration suggests that the capital mobility resulting from financial integration allows capital providers from developed countries to lend directly to entrepreneurs in developing countries (Giannetti and Ongena, 2005). This scenario, which allows banks to conduct business in other countries without establishing any offices, branches or subsidiaries, is known as institutional mobility resulting from capital mobility (Mian, 2006).

Foreign banks face distance constraints, which depend on the mode and level of entry selected. The three types of these constraints, which are primarily caused by a combination of information and agency costs, are geographical and cultural distance; hierarchical distance; and institutional distance (Mian, 2006). The reasons for geographical and cultural distance are obvious: foreign-owned banks must operate outside of their home countries, with the possibility that the cultures in other countries might differ from those in their home countries. Hierarchical distance exists because there are generally large numbers of organisational layers or hierarchies between home country chief executive officers (CEOs) and foreign loan officers. Finally, institutional distance refers to differences in the legal and regulatory frameworks of the home and host countries. Distance constraints can affect the achievement of shareholder goals by requiring managers in the foreign country to

[7] This empirical literature is consistent with the prediction of the model for bank organisational forms by Dell' Ariccia and Marquez (2010)

comply with either fewer or additional regulations. This constraint is particularly notable in the case of fewer requirements, wherein the relevance of agency theory concerning foreign-owned banks is important.

2.2.2 Empirical Research Findings

The performance of government-owned banks in developing countries is generally characterised by the following: low efficiency; low profit; limited credit availability to borrowers; poor lending decisions reflected in high non-performing loans (NPLs); and inefficient capital allocation.[8] La-Porta et al. (2002) and Sapienza (2004) suggest that the poor performance of government-owned banks is primarily related to political issues because government banks are used as mechanisms to provide political patronage and political advantage to governing entities.

Berger et al. (2005) apply three criteria as indicators of government-owned bank performance, namely, credit availability, portfolio allocation and efficiency. These criteria are addressed within the context of the social objective of government-owned banks to direct lending to unprofitable regions or industries to support economic development while forgoing profit maximisation objectives. Berger et al. (2005) find that government-owned banks often receive excessive subsidies from the government to support their financial requirements and provide loans with political motives. As a result, this type of bank experiences low efficiency and high levels of non-performing loans. Studies conducted by Mian (2003), Sapienza (2004) and Dinc (2005) use profitability and lending decisions as indicators of government-owned bank performance, whereas Taboada (2011) focuses on capital allocation. These researchers' findings indicate that lending decisions are based on political motives and that government-owned banks increase loans before elections for such purposes.

A slightly different indicator is used by Barth et al. (2001) and Laeven and Levine (2006), who emphasise regulation and supervision in their studies. The findings of Barth et al. (2001) indicate that government-owned banks tend to generate corruption, whereas Laeven and Levine (2006) indicate that capital requirement

[8] Findings reported in La-Porta (2002), Barth et al. (2004), Mian (2003), Beck et al. (2004), Sapienza (2004), Berger et al. (2005a), Dinc (2005), Micco and Panizza (2006), and Taboada (2011).

regulations and official supervision do not affect risk-taking by government-owned banks.

Researchers also use macroeconomic factors such as countries' financial development, access to credit and economic growth as measures of government-owned bank performance (La-Porta et al., 2002, Barth et al., 2004, Giannetti and Ongena, 2005, De-Haas and Naaborg, 2006, Beck et al., 2011). Previous studies generally indicate that when government-owned banks dominate the market, the misallocation of capital to borrowers who receive special advantages from government-owned banks reduces access to credit for other authentic borrowers and contributes to slow financial system development and economic growth.

Profitability and cost efficiency are commonly used as indicators to assess the performance of government-owned banks when comparing different bank ownership types (Berger et al., 2005, Iannotta et al., 2007, Berger et al., 2009a, Taboada, 2011). Using ordinary least squares regression, Berger et al. (2005) found that after the privatisation of government-owned banks in developing countries, the privatised banks (now domestic-owned banks) apply greater prudence in lending and therefore experience lower levels of NPLs. In addition, according to Taboada (2011), government-owned banks that have been privatised and have become domestic-owned banks perform better than non-privatised government-owned banks in terms of capital allocation efficiency because they provide more credit to industries that contribute to gross domestic product (GDP). According to Berger et al. (2005), government-owned banks that have been privatised outperform non-privatised government-owned banks in terms of profits, efficiency and lending in countries such as Australia, Portugal, Italy, Brazil, Mexico, Nigeria, Pakistan, OECD countries and developing countries. Using regression analysis, Iannotta et al. (2007) confirm the low performance of government-owned banks relative to domestic banks in terms of profitability, loan quality and insolvency risk. The research was conducted in 15 European countries over the period 1999-2004.

Research on domestic-owned banks that did not include comparisons with other bank ownership types has primarily focused on the massive wave of mergers and acquisitions of domestic-owned banks in the United States (Berger et al., 2005) and the role of domestic blockholders (Taboada, 2011). The findings of Berger et al.

(2005), based on data from the 1980s, provide evidence that there is little or no cost efficiency improvement following the consolidation of domestic-owned banks. However, cost efficiency changed in the 1990s, with certain studies reporting gains in cost efficiency after consolidation (Berger et al., 2005). Despite the lack of cost efficiency improvement in the 1980s, other improvements occurred, including profit efficiency resulting from mergers and acquisitions during both the 1980s and the 1990s. Improvements in profit efficiency often resulted from loan portfolio changes. For example, large U.S. banks focused on large firms and moved away from small and medium-sized enterprises to improve their risk-return frontiers (Berger et al., 2005).

Other findings obtained by Taboada (2011) indicate that domestic banks in countries such as Belgium, Colombia, and Germany experienced a significant increase in domestic blockholder ownership. Blockholder domination applied by major shareholders leads to ineffective capital allocation because in some cases, loans are provided to unproductive economic sectors and therefore reduce credit for industries that lack access to external finance.

Numerous studies have compared domestic-owned banks and foreign-owned banks. In Eastern European transition countries (countries experiencing a transition from planned economies to market economies), domestic-owned banks generally are more efficient, are more aggressive in lending, hold fewer liquid assets, and have lower levels of non-performing loans than foreign-owned banks (Bonin et al., 2005, Mian, 2003). [9] In addition, Chen and Liao (2011) demonstrated that based on individual country analysis, domestic banks outperform foreign banks in countries such as Croatia, Luxembourg, Hong Kong and Thailand. In terms of profitability, Berger et al. (2005) also found that domestic-owned banks are more efficient than foreign-owned banks in developed countries. Foreign-owned bank entry causes a decrease in the profit and interest margins of domestic-owned banks, although the latter remain more efficient. Research conducted in other countries has not provided similar findings. Mian (2006), researching Pakistan, suggests that the profitability and productivity of domestic-owned bank lending are similar to that of foreign-owned banks. Further, research in low-income countries by Detragiache et al. (2008)

[9] See De-Haas et al. (2010)

indicates that domestic-owned banks have riskier loan portfolios than foreign-owned banks, as well as higher levels of loan loss provisions and larger loan loss reserves because of competition from foreign-owned banks. The research of Clarke et al. (2001a), conducted in eight regions, indicates that foreign-owned banks outperform domestic-owned banks. Clarke et al.'s perspective is supported by Claessens et al. (2001), Bonin et al. (2005), Micco and Panizza (2006), and Berger et al. (2009b). [10]

Foreign-owned banks are more profitable than domestic-owned banks, particularly when they operate in less-competitive host countries and when their parent banks are highly profitable (Chen and Liao, 2011). Countries in which foreign-owned banks perform better than domestic-owned banks in terms of profits include Austria, Indonesia, Poland and Italy. Using financial ratios to compare foreign-owned and domestic-owned bank performance, Claessens et al. (2001) demonstrate that foreign-owned banks in developing countries such as Egypt, Argentina, Indonesia and Venezuela realise higher profits than domestic-owned banks because of higher interest margins.

Mian (2003), referring to Stein (2002), suggests that domestic-owned banks are able to lend to "soft information firms" (firms with a lack of credible and publicly verifiable information) because domestic-owned banks possess flatter organisations with little distance between local managers and top managers. As such, local managers are generally allowed to exercise greater discretion concerning the inclusion of soft information when making loan decisions. Moreover, De-Haas et al. (2010) indicate that the tendency of domestic banks to serve local "soft information" customers is based on their relationship-based lending ability. Because of their long-term relationships with local customers, these banks accumulate sufficient information regarding customers' repayment capacity, thereby reducing formal credit assessment activity and lending costs.

The competitive advantage of domestic banks in serving "soft information" customers is based on their expertise in and knowledge of the specific market segments that they focus on in lending (Stein, 2002). However, the downside risk of

[10] The regions are the Caribbean, Central and Eastern Europe, the Commonwealth of Independent States, East Asia and China, Latin America, Middle East and North Africa, South Asia and sub-Saharan Africa.

this strategy is the high level of concentration when external macroeconomic shocks affect their target market. This issue is also raised by Mian (2003), who indicates that foreign-owned banks tend to devote greater attention to the possible effect of macroeconomic shocks than do domestic-owned banks. However, a study of less-developed countries in five regions (sub-Saharan Africa, Latin America, the Middle East and North Africa, Europe and Central Asia, and Southeast Asia) by Detragiache et al. (2008) found that when foreign-owned banks enter the market, their loan portfolios are focused on sectors/segments that differ from the soft information sectors/segments that domestic-owned banks tend to include. This finding supports the "cream-skimming" argument, according to which foreign-owned banks focus on large and transparent firms, thus creating a disproportional decrease in loans to small and opaque firms (Detragiache et al., 2008).

Foreign-owned banks often employ asset-backed lending criteria rather than credit scoring methods when providing loans to borrowers to overcome problems associated with the insufficient availability of hard information (De-Haas et al., 2010). However, recent studies by Beck et al. (2011) demonstrate that the exclusive use of arm's-length lending based on hard information (credible and verifiable information) is no longer the only method applied by foreign-owned banks. These findings are also evident in the studies by La-Torre et al. (2010) and Berger and Black (2011), who find that foreign-owned banks do not deliberately discriminate against small and opaque firms with soft information characteristics; instead, the banks value both arm's-length lending and relationship lending. According to De-Haas et al. (2010), foreign-owned banks serve customers in the host country by relying on their home country experience in the retail market. Thus, it is evident that foreign-owned banks exclude or limit certain lending services to certain market segments exclusively based on their previous risk experience in their home countries or in other countries in which they operate.

The hesitancy of foreign-owned banks to engage in the soft information borrower market is related to their risk-averse profile (Mian, 2006). These banks establish higher and more prudent standards in evaluating credit. Mian's research findings in Pakistan indicate that the quality of soft information loans is generally poor; thus, foreign-owned banks do not expose themselves to these loans, whereas domestic-

owned banks tend to do so. Foreign-owned banks must comply with host country regulations and home country supervision, which place greater pressure on foreign-owned banks than on domestic-owned banks.

Notwithstanding these findings, certain forms of foreign-owned bank credit exist for small and medium-sized enterprises in other countries where the risk is lower (Beck et al., 2004, Berger and Udell, 2005, De-Haas et al., 2010).This finding is also supported by Giannetti and Ongena (2012), who indicate that foreign banks improve credit access to all firms in emerging markets.

Taboada (2011) suggests that the superiority of foreign-owned banks is demonstrated by their profitability and efficiency, primarily in emerging markets. High interest margins may result from foreign-owned banks' exemption from credit allocation regulations and restrictions that typically hamper margins. Domestic market inefficiencies and outdated banking practices implemented in host countries are other possible reasons for the higher profitability of foreign-owned banks, as observed by Claessens et al. (2001). Micco et al. (2007) also reported higher foreign-owned bank profitability using a simple regression method based on data from 119 countries over the 1995 to 2002 periods.

Focusing on efficiency, Micco and Panizza (2006) also found that foreign-owned banks are generally more cost efficient than state-owned banks and domestic-owned banks. The findings of Bonin et al. (2005) are similar. Based on their study in transition countries such as Bulgaria, the Czech Republic, Estonia, Poland and Hungary, Bonin et al. (2005) indicate that foreign-owned banks are more cost efficient than domestic-owned and government-owned banks in providing services, particularly when they have strategic foreign owners (single majority foreign owners or single controlling foreign owners).

Countries in which foreign-owned banks operate often receive economic benefits. The banks' contribution to financial sector development and financial stability depends on host country, home country and bank characteristics (Claessens and Horen, 2012). Foreign-owned bank entry may foster competition, efficiency and stability in the banking industry and may positively affect capital allocation (Taboada, 2011). Foreign-owned banks possess better access to capital markets

(Berger et al., 2005) and external liquidity from their parent banks, relative to domestic-owned banks (Mian, 2003). In crisis periods, foreign banks do not reduce the supply of credit to the same extent as domestic-owned banks do (De-Haas and Van Lelyveld, 2003).

Foreign-owned banks possess superior ability in risk management, technology (mostly in collecting and assessing hard information) and innovation (Berger et al., 2005). Giannetti and Ongena (2005) indicate that foreign lending eliminates the problem of "related" lending, thereby improving capital allocation in host countries. Furthermore, foreign-owned bank entry improves domestic bank skills and technology (Clarke et al., 2001a).

The empirical findings concerning bank ownership and its relationship with bank performance and the characteristics of government-, domestic-, and foreign-owned banks extracted from the literature are summarised in Tables 2.2 and 2.3.

Table 2.2 Effect of Bank Ownership Types on Bank Performance: Empirical Research Findings

Ownership Types	Author	Ownership Variables	Performance Variables	Main Findings
Government Banks	La-Porta et al. (2002)	Government ownership of banks	Commercial bank costs to Total Bank Assets	Poor Government Bank performance: • declining financial system development • slower economic growth • reduced access to credit • lending based on political motives • low efficiency • high non- performing loan ratios
	Barth et al. (2004)	Regulatory and supervisory practices	Banking sector development, efficiency and fragility	
	Sapienza (2004)	Government ownership	Bank Lending	
	Berger et al. (2005)	Static and dynamic of domestic, foreign and state change	Profit efficiency rank, ROE, Cost efficiency rank, Costs/Assets, NPL	
	Berger et al. (2005)	Static and dynamic domestic, foreign and state change	Profit efficiency rank, ROE, Cost Efficiency Rank, Costs/Assets, NPL	Better performance after privatisation • greater prudence in lending • lower level of NPLs • more efficient capital allocation
	Taboada (2011)	Bank ownership	Allocation of capital	
Domestic Banks	Bonin et al. (2005)	Bank ownership	Financial Ratios : ROE, NIM, etc	More efficient performance compared to foreign banks: • More aggressive in lending • hold less liquid assets • have a lower level of non-performing loans Less efficient performance compared to foreign banks: • riskier loans • higher level of loan loss provisions • larger loan loss reserves due to competition
	Detragiache et al. (2008)	Foreign Bank	Private Credit	
	Taboada (2011)	Bank Ownership	Allocation of Capital	Less efficient performance compared to foreign banks: • providing loans to unproductive economic sectors • reducing credit availability for industries with lack of access to external finance

Table 2.2 Effect of Bank Ownership Types on Bank Performance: Empirical Research Findings (continued)

Ownership Types	Author	Ownership Variables	Performance Variables	Main Findings
Foreign Banks	Mian (2003)	Bank Ownership Types	Profitability	• Less profitable than domestic-owned banks
	Clarke et al. (2001a)	Foreign Bank	Access to Credit	• Better performance than domestic banks
	Bonin et al. (2005)	Bank Ownership Types	Efficiency	• More cost-efficient and provide better services
	Micco and Panizza (2006)	Bank ownership	Profitability and Cost	• Higher profitability and lower cost
	Unite and Sullivan (2003)	Foreign, insider, government and other ownership	Interest Rate spreads, profit, non interest income, operating expense and risk	• Alleviation of related lending problems
	Giannetti and Ongena (2005)	Foreign Bank	Lending	• Mitigate problems of related lending and allocate the capital to more efficient projects
	Berger, Hasan and Zhou (2009)	Bank Ownership: big four, non-big four majority state-owned, majority private domestic, majority foreign	Profit and Cost Efficiency	• Foreign banks are the most efficient, the big four government banks are the least efficient, and minority foreign ownership is associated with significantly improved efficiency
	Cull and Peria (2010)	Foreign Bank	Private Credit	• Foreign participation did not coincide with increased credit to private sectors
	Claessens and Horen (2012)	Foreign Bank	Private Credit	• Foreign banks have higher capital, more liquidity, and lower profitability

Table 2.3 Bank Ownership Types : A Comparison of Characteristics

No	Characteristics	Government-owned Banks	Private -owned Banks	Foreign-owned Banks	Source
1	Objective/Motives	Social welfare and political goals	Profit Maximisation	Profit Maximisation for entire international organisation	Berger et al. (2005)
2	Organisational Design and Type of borrower information used	Hierarchical/ Hard Information	Flat/ Soft Information	Hierarchical/ Hard Information + soft information	Stein (2002), Mian (2003), Beck (2011), Berger and Black (2011)
3	Agency Problem • Type • Degree	 I (taxpayers vs. bureaucrat managers) Highest	 II (Major/blockholders vs. minor shareholders) Medium	 I (shareholders vs. professional managers) Lowest	Mian(2003); Taboada (2011)
4	Nature of Corporate Governance • Cash Flow vs. Control Rights • Manager Incentives to achieve objective	 Cash Flow Rights = taxpayers Control Rights = bureaucrats Low	 Cash Flow Rights = Control Rights= domestic shareholders High	 Cash Flow Rights = Control Rights= Foreign shareholders High	Mian (2003)
5	Degree of monitoring by shareholders	Low	High	High	Mian (2003)
6	Degree of Information Asymmetry • Moral Hazard • Adverse Selection	 High High	 Medium Medium	 Medium Medium	Dell'Ariccia and Marquez (2004)
7	Compliance to regulation	Low, due to its dual role as owner and regulator	High, due to maintaining reputation	High, due to supervision and reputation (at home and host countries)	Mian (2006)
8	Response to competition	Slow	Quicker, as a response to foreign bank entry	Quickest, to penetrate host country market	Dell' Ariccia and Marquez (2004)

Table 2.3 Bank Ownership Types : A Comparison of Characteristics (continued)

No	Characteristics	Government-owned Banks	Private -owned Banks	Foreign-owned Banks	Source
9	Lending Decision	Poor (mostly based on political motives)	Better (mostly based on soft information)	Better (mostly based on hard information)	La-Porta et al. (2002), Mian (2003), Sapienza (2004), Dinc (2005),Micco and Panizza, 2006, Detragiache (2008) Berger et al. (2005), De-Haas (2010)
	• Loan Portfolio Allocation	Specific sectors for social welfare , government- related projects and institutions	Retail market (small domestic firms and customer for mortgage lending)	Large firms and government (corporate sector/ wholesale market), starting to serve retail as well	
	• Loan Portfolio Strategy	Focus (on certain unprofitable industries)	Focus (on opaque borrowers)	Focus (on large borrowers)	Berger et al. (2005), Degryse et al. (2012)
	• Loan Pricing	Low interest rate due to government subsidy	Higher interest rate but in narrowing spread due to competition pressure and increasing efficiency	Lower interest rate due to specific portfolio composition	Sapienza (2004), Detragiache (2008), Unite and Sullivan (2003), Degryse et al. (2012)
10	Risk Taking Behaviour (for bad risk)				
	• Degree	High	Higher than Foreign Bank	Low	Mian (2003)
	• Risk Management	Low	Medium	High	
11	Performance				Berger et al. (2005), Bonin et al. (2005), Micco et al. (2007), and Iannotta (2007)
	• Profit	Low	Inconclusive*	Inconclusive*	
	• Efficiency	Low	Inconclusive*	Inconclusive*	
12	Impact on Macroeconomic Factors				
	• Financial Development	Better after privatisation	Better after foreign bank entry and privatisation	Positive	La Porta et al. (2002), Montgomery (2003) Berger et al. (2005), Giannetti and Ongena (2005)
	• Access to credit	Better after privatisation	Better after foreign bank entry	Better, start to serve soft-information borrowers	Unite and Sullivan (2003), Dinc (2005), Mian (2006), Micco and Panizza (2006), Detragiache et al. (2008), Taboada (2011)
	• Economic growth	Low	Low (due to block-holders)	Better	Taboada (2011), La-Porta et al. (2002), Giannetti and Ongena (2005)

*= inconclusive refers to a condition where the results are mixed; some indicate positive results whereas the others indicate the other way around

2.3 Loan Portfolios

Loan portfolios, similarly to stock or bond portfolios, consist of combinations of loans that have been issued or purchased and are being held for repayment (Scott, 2003). The composition of loan portfolios results from the allocation of loans into various categories, taking into account interest rates, loss probability (Scott, 2003), cash flows and maturities (Sathye et al., 2003) and central bank regulations (Rossi et al., 2009). The allocation may be focused or diversified across products and sectors/segments.

Although a focus strategy may create concentration risk, in certain cases risk is minimised by selecting high-quality individual loans with low default rate (Deutsche Bundesbank, 2006). Conversely, diversifying portfolios according to modern portfolio theory to contain individual loan transactions with low correlations reduces the credit risk of a portfolio (but also the return), similar to stock and bond portfolios. When combining individual loans into portfolios, the relationship among the individual loan transaction risks must be observed because it affects loan portfolio risk and its subsequent return (Cronje, 2013).

Traditionally, loans were allocated to categories based on loan types, such as commercial and industrial loans, real estate loans, and consumer loans. Other categorisation criteria such as industries and geographical areas were subsequently included for bank risk profiling and segmentation purposes (Cronje, 2013).

The classification of loans according to geographic regions, products and industry categories is described by Cronje (2013) as follows:

- **Regions** represent different geographical areas such as local, regional, national and international. Classifying loans by region is important because different areas may have different economic activity or prosperity and may be affected differently by macro-environmental factors such as economic cycles, competition, technological changes, etc.
- **Products** relate to market segments served by banks. Different market segments require different types of bank products. For example, residential mortgage loans serve consumer markets, whereas industrial loans serve business/corporate

markets. The type of products and their application by users may represent different credit risks.

- **Industrial** analysis is important because changes in the macro-environment and market environment typically affect the credit risk applicable to specific industries differently.

By diversifying loans across different regions, products, and industries, banks are expected to have lower default risk (Cronje, 2013), thereby being less vulnerable to external macro implications such as economic downturns. [11]

2.3.1 Loan Portfolio Structures

2.3.1.1 Loan Portfolio Composition

The composition of loan portfolios reflects the extent to which banks apply focus or diversification strategies.[12] The diversification strategy is based on the modern portfolio theory of Markowitz (1952) and is largely followed by experts in financial institutions (Winton, 1999). According to the idiosyncratic risk hypothesis, diversification eliminates the specific (idiosyncratic) risk, which enables banks to reduce their monitoring efforts and, therefore, their operating costs, which ceteris paribus should lead to greater cost efficiency (Rossi et al., 2009). Furthermore, the benefit of diversification stems from employing economies of scope across different categories such as economic sectors and geographical areas (Laeven and Levine, 2007). Numerous benefits and costs of diversification have been identified, as indicated in Table 2.4.

[11] For research on geographic diversification and bank value, see, Elyasiani and Deng, 2008

[12]The construction should consider factors such as the asset mix, loan types, diversification, geographic limits, expertise, policy formulation and environmental issues, see, e.g., Sathye et al., 2003

Table 2.4 The Benefits and Cost of Diversification: Overview of Key Literature

Author (Year)	Diversification Benefits	Diversification Costs
Hayden et al. (2006)	• Reduce risks of bank failure • Reduce cost to achieve credibility of bank role as screeners or monitors of borrowers	• Agency Problems • Inefficient allocation of resources • Loss in bank value
Rossi et al. (2009)	• Reduce the cost of financial intermediation • Increase the incentive to monitor	• Increased systematic risk
Berger et al. (2010)	• Reduce chance of financial distress • Provide to achieve credibility of banks as monitors of borrowers • Leverage of managerial skills and abilities across products and geographic regions • Gain economies of scope and economies of scale • Provide financial supermarket ability in terms of multiple products	• Dilution of management comparative advantage • Inducing competition • Increased agency costs
Elsas et al. (2010)	• Economies of scope • Improve resource allocation • Lower tax burden due to higher financial leverage • Ability to use firm-specific resources to extend competitive advantage from various markets	• Agency problems • Inefficient internal resource allocation • Informational asymmetries between head office and divisional managers • Increased incentive for rent-seeking behaviour by managers
Tabak et al. (2011)	• Reduce bank probability of default • Reduce financial intermediation costs • Reduce vulnerability to economic downturns	• Increased competition • Unable to reap benefits from business expertise in specific sector

As shown in the summarised information in Table 2.4, researchers indicate that risk is reduced in different contexts by diversification but that agency problems and other costs emanate from diversification. In addition, diversification does not always reduce risks and/or improve returns. [13] Diversification has been shown to increase banking sector risk in Brazil and Italy and to reduce the performance of banks in China, Germany and small European countries (Tabak et al., 2011a). In terms of diversification across industries, Acharya et al. (2002) found that diversification produces riskier loan portfolios for high-risk banks and reduces the returns of these banks. Laeven and Levine (2007) found that diversification premiums, in terms of the economies of scope that a bank should obtain from engaging in multiple activities, are insufficient because of the increasing agency problems associated with product diversification.

Despite the negative findings concerning diversification, a study by Elsas et al. (2010) provides empirical evidence supporting the efficiency of diversification. Examining nine countries over the period 1996-2008, the study found that diversification creates market value and increases bank profitability based on economies of scope. [14] Mixed results were reported by Behr et al. (2007) in the German banking sector, where diversification is more effective in reducing risk than in improving returns.

The negative results from loan portfolio diversification emanate from factors such as loan monitoring and loan portfolio quality (Acharya et al., 2002, Elyasiani and Deng, 2004, Rossi et al., 2009). The lack of loan monitoring by bank managers in a diversified loan portfolio may result in increased loan loss provisioning. This phenomenon is explained by the lack of expertise hypothesis, which states that the loan portfolios may consist of low-quality individual loans based on a lack of expertise in areas targeted for diversification. Therefore, although highly diversified, the loan portfolios may also create above-average loan loss provisions. These loan quality problems may require banks to incorporate additional economic capital as a safeguard for risk-weighted assets (Rossi et al., 2009). This requirement may

[13] These include Winton (1999), Acharya (2002), and Hayden (2006).

[14] The different results obtained by Laeven and Levine might relate to differences in how they measured diversification: different measures, explanatory variables, regression frameworks, and samples (Elsas et al., 2010).

substantially reduce the financial return of the banks, as supported by the findings of Behr et al. (2007) in the German banking industry.

Some governing rules, such as the lending limits that central banks impose on banks, encourage diversification. Conversely, other restrictive regulations regarding branching, entry, and asset investment often encourage focus strategies (Berger et al., 2010). However, the existence of regulatory guidelines encouraging diversification, which result in a large number of individual clients and industries, may increase monitoring costs and reduce cost efficiency (Rossi et al., 2009). Furthermore, because managers may be risk averse, they may incur additional costs in searching for high-quality loans for diversification. These factors may reduce diversification's risk/return efficiency.

A focus strategy, as opposed to a loan portfolio diversification strategy, suggests concentrating on specific segments for which a bank has superior knowledge and monitoring ability. Focusing on a specific segment is effective when banks face information asymmetry (Acharya et al., 2002, Kamp et al., 2005, Berger et al., 2010, Tabak et al., 2011b). Based on different degrees of asymmetric information concerning borrowers, the composition of bank loans across sectors may differ (Dell' Ariccia and Marquez, 2004). The reallocation of loans (commonly known as the flight to captivity) to sectors in which greater adverse selection problems exist may result when banks face merely intrinsic overall competition from other outside lenders entering the market.[15] This finding implies that more lenders may attract borrowers in sectors subject to low information asymmetries. The existing informed lenders may therefore face more captured (but also higher risk) borrowers that did not previously form part of their market but that operate in sectors to which the bank reallocates loans (Dell' Ariccia and Marquez, 2004).

Specifically, Winton (1999) suggests that a loan focus strategy is effective amid low and high downside-risk conditions because the benefits of monitoring outweigh the risks of poor diversification. Employing a focus strategy leads to a low probability of failure when risks are low. When risks are high, the monitoring benefit will outweigh

[15] The flight to captivity implies that banks reallocate their portfolios towards more captive borrowers when shocks to their balance sheets, or from their competitive environment, force them to alter their lending patterns.

the cost because the bank will only expose itself to a few sectors that can be monitored well enough to sufficiently counteract the impact of a downturn to evade bankruptcy. Thus, this line of thought implies that the relationship between risk and return for a focus strategy is U-shaped. Loan portfolios' credit risk is affected by loan monitoring quality, as shown by the work of Winton (1999) suggesting the endogenous nature of the relationship between credit risk and monitoring ability. This finding differs from the assumption of the general loan portfolio model (CreditMetrics, CreditRisk+ or CreditPortfolio View) in which the credit risk of individual and group loans is exogenously affected by a bank's monitoring ability (Winton, 1999).

Implementing a focus strategy can assist banks in retaining the comparative advantage of existing expertise, resulting in organisational efficiency (Klein and Saidenberg (1997) quoted in (Berger et al., 2010)). However, increased competition in the markets in which focus strategies are applied may force banks to diversify. This scenario may result in a "winner's curse" problem when banks are forced to apply such diversification to markets in which strong competition may exist. They may often incur substantial costs associated with such diversification and the selection of low-quality borrowers (Winton, 1999). Finally, the strategy (diversified or focussed) adopted by a bank depends on the risk-return trade-off (Tabak et al., 2011a).

2.3.1.2 Measuring Bank Loan Portfolio Concentration

Bank loan portfolio concentration levels have been used in studies to comparatively analyse their effects on bank risk and performance. These concentration levels are important because they have been the cause of numerous past bank failures (Dullmann and Masschelein, 2006). In addition to simple, model-free procedures, relatively advanced modelling approaches can be used to measure both single-name concentration/granularity and sectoral concentration. [16]

[16] Single-name concentration: The firm-specific risk (idiosyncratic) in a credit portfolio that arises from the credit risk of large borrowers. Sectoral concentration: uneven distribution across sectors or industry or geographical regions (Deutsche Bundesbank, 2006).

The methods that are applied to measure single-name and sectoral concentration differ. The commonly applied model-free methods for single-name concentration measurement are ratios and the Gini coefficient. The Gini coefficient for a portfolio of N loans of proportion X_1, X_2, …,X_N can be calculated as follows (Bandyopadhyay, 2010):

$$G(X_1, X_2, \dots, X_N) = \frac{\sum_{i=1}^{N}(2n-1)x_i}{N} - 1 \quad \text{.....(2.1)}$$

Thus, the Gini coefficient is: $G = 1 - \sum p_i(Z_i + Z_{i-1})$ .....(2.2)

(p_i = probability of the number of borrowers and Zi is the loan share)

The values of the Gini coefficient range between 0 and 1. The larger the Gini coefficient is, the more concentrated the bank loan portfolios are.[17] However, the coefficient does not account for portfolio size, which has been regarded as a limitation (Bandyopadhyay, 2010).

The Herfindahl-Hirschman Index (HHI) is another model-free method that can be used to measure both single-name and sectoral concentration. [18] The formula for the HHI model-free method for measuring sectoral concentration is:

$$HHI = \sum_{i=1}^{N}\left(\frac{p_i}{Q}\right)^2 \quad \text{.....(2.3)}$$

Where: $Q = \sum_{i=1}^{N} p_i$; pi = the percentage of loans to each sector; and N = upper limit of the HHI.

The boundaries of the HHI are given by: $1/n \leq HHI \leq 1$, where *n* denotes the number of segments. The higher the index is, the more concentrated the bank loan portfolios are. The limitation of the HHI in measuring single-name concentration lies in its inability to incorporate the loan default probability as a proxy for loan quality. Based on the formula, the HHI is essentially a measure of portfolio composition because the index provides information on the relative composition of the loan portfolio, whether

[17]Bandyopadhyay (2010) further classifies the criteria as follows: A Gini coefficient of less than 0.3 indicates substantial equality; one between 0.3 and 0.4 indicates acceptable normality; and a value above 0.4 indicates high inequality or high concentration.

[18] A comparison of loan portfolio concentration for both aggregate and individual data using the HHI was performed by Avila (2006)

it is more focused or diversified (Acharya et al., 2002, Hayden et al., 2006, Tabak et al., 2011b). The HHI also assumes an equally distributed benchmark (Pfingsten and Rudolph (2002) and Kamp et al. (2005)). When used to measure sectoral concentration, the HHI ignores the interdependency of credit risk between sectors (Deutsche Bundesbank, 2006).

Another model-free sectoral concentration measure suggested by Pfingsten and Rudolph (2002) is the distance measure, which identifies the extent to which the structure of a bank's loan portfolio differs from a loan portfolio benchmark. The market loan portfolio is commonly used as the benchmark. Small deviations from the market loan portfolio (low value) indicate diversification, whereas high values indicate concentration. Distance measure is a better measure of loan portfolio concentration because it incorporates differences in the sizes of each sector (Kamp et al., 2005). According to Pfingsten and Rudolph (2002), the advantage of the distance measure lies in its simplicity and its independence from particular risk/return specifications.

The asymptotic single risk factor (ASRF) model is suitable for modelling systematic risk by assuming that in a well-diversified (infinitely granular) portfolio, the unsystematic (idiosyncratic) risk disappears. The weakness of this model is in the absence of single-name concentration risk. To overcome the problem, the ASFR integrates single-name concentration in its measurement using a granularity adjustment. This formula calculates the appropriate economic capital needed to cover the risk arising from the potential defaults of large borrowers. It is based on the difference between the unexpected loss in a real portfolio with that of a well-diversified or infinitely granular portfolio with the same risk characteristics (Deutsche Bundesbank, 2006).

The multi-factor model is used to determine the total risk of a loan portfolio, taking single-name and sectoral concentration into account (Deutsche Bundesbank, 2006). It combines several factors to explain or predict concentration risk. This model requires more inputs than the other methods. It is the ideal method to measure concentration risk in loan portfolios because it incorporates the probability of loan default; however, this model requires information such as the number of borrowers and the

probability of loan defaults that is not generally available to external bank researchers.

Migration analysis is another method used to measure the loan portfolio credit risk concentration (Lange et al., 2010). This method measures loan concentration risk by tracking firm credit ratings in particular sectors or ratings classes to identify unusual declines. The ratings information is obtained from external rating agencies such as Standard & Poor's, Moody's and Fitch and from internal credit rating divisions. As a benchmark for comparing new loans, a loan migration matrix can be used. In essence, the loan migration matrix measures the probability of changes in the loan condition (downgraded, upgraded or default) based on historical data.

Migration analysis is used in conjunction with concentration limits set to the maximum loan size that can be issued to an individual borrower (Lange et al., 2010). By using migration analysis, banks are able to decrease (increase) loans to specific sectors if the credit ratings of several firms in the specific sectors decrease (increase) faster than before. Banks adjust their loans accordingly by establishing concentration limits for single borrowers or for specific sectors to limit exposures to acceptable levels.

In cases in which banks possess loan volume data for different products, markets or segments, they can apply portfolio theory, partially based on the loan volume and the loan-loss ratio (Lange et al., 2010). The loan volume model is used to measure the diversity of a bank's loan portfolio by comparing the portfolio to the market average that serves as a benchmark. The assumption is that the market average benchmark is the desired or least risky structure. The benchmark can be constructed from published central bank data. For example, central banks publish aggregated amounts of loans to various sectors and for different bank products. Thus, banks can use the benchmark to compare the deviation of their own loan allocation across various industries or sectors with the benchmark. The greater the deviation from the benchmark is, the riskier the loan portfolio is. The assumption of this measure is that the national average serves as the expected spread. However, according to Cronje (2013), substantial deviations may be retained in special cases in which the targeted segments consist of less risky forms of finance (for example, fully secured housing

loans), if there are derivative instruments to hedge the potential losses or when the associated costs to diversify exceed the benefit.

The loan-loss ratio model is an approach to estimate "**the systematic loan-loss risk of a particular sector relative to the loan-loss risk of a bank's total loan portfolio**" (Lange et al., 2010 396).

By evaluating individual loans and assigning credit ratings to both the individual loans and segment portfolios, a bank is able to identify differences in the loan quality of segments and of the total loan portfolio. This ability allows bank managers to make adjustments to the composition of the bank loan portfolio. In cases in which there is excessive concentration in total loan portfolios, banks may use loan sales, securitisation and derivatives as risk transfer methods (Cronje, 2013) to adjust loan portfolio risks after loan origination (Pfingsten and Rudolph, 2002). However, these methods are not intended to be the sole means of managing extremely high-risk loans, as their primary purpose is to hedge against total credit risk and manage loan portfolios effectively (Cronje, 2013).

2.3.2 Loan Portfolio Performance

Loan portfolio performance, as commonly measured by income (return) and cost (risk), is the ultimate output of loan portfolio composition.

2.3.2.1 Loan Portfolio Risks

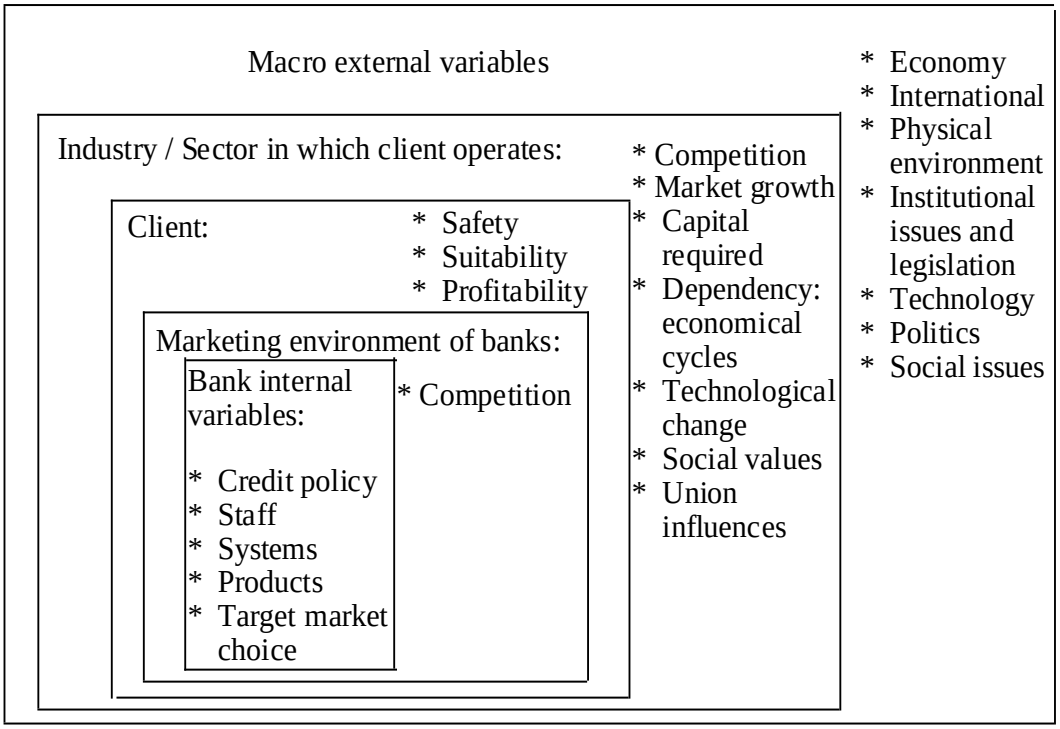
A portfolio's credit risk is essentially composed of loan defaults and arises from two sources, systematic and idiosyncratic (unsystematic) risk. Systematic risk represents the effect of unexpected changes in macroeconomic and financial market conditions on the performance of borrowers. Although borrowers may differ in their degree of sensitivity to systematic risk, few firms are entirely indifferent to the broader economic conditions in which they operate. Therefore, the systematic component of portfolio risk is unavoidable and only partially diversifiable. Idiosyncratic risk represents the effects of risks that are particular to individual borrowers (Csongor and Curtis, 2005).

Aver (2008) identifies several factors that influence systematic credit risk: macroeconomic factors, changes in economic policies, political changes and the goals of leading political parties. Macroeconomic factors include the inflation rate, the employment rate, the growth in gross domestic product, the stock index and exchange rate movements. Changes in economic policies include changes in monetary and tax policies, economic legislation, import restrictions and export stimulation policies.

Unsystematic credit risk refers primarily to the loan default probability of single entities within the loan portfolios. In the case of individual customers, this type of risk includes aspects such as their integrity, their financial solvency and capital, credit insurance and general terms and conditions applicable to their loan agreements. Mramor (1996) suggests that in the case of companies, specific aspects pertaining to both the industry/sector and the company are important (Aver, 2008). Industry aspects include the maturity of the industry, the structure and economic success of that industry, and its stability, whereas company aspects include the general characteristics of the company, its management, its financial position, its sources of funds and financial reporting (Aver, 2008). In contrast to systematic risk, the unsystematic component of portfolio risk is diversifiable.

The interaction of systematic and unsystematic factors that affect credit default risk is depicted in Figure 2.1 below (Cronje, 2010). The figure indicates that credit default risk is primarily determined by banks themselves in terms of their credit criteria reflected in their credit policies; the competency of their staff; information available from their systems; the riskiness of their various loan products; and the sectors or segments that they focus on in providing loans. Competition among banks in the marketplace affects banks' credit default risk by influencing the supply/demand for loans, which again affects the lending criteria that banks apply in terms of the safety, suitability and profitability of loan transactions and the markets (sectors or industries) that banks choose to focus on. According to Cronje (2013), there is a different risk inherent in each industry, region or product of a bank; this concept is known as intrinsic risk. It is important to determine the intrinsic risk of industries, regions, and products. All of the aforementioned aspects are affected by macro-environmental factors such as the economy.

Figure 2.1 Factors Affecting Credit Risk



Source: Cronje (2010), p.7

Loan portfolio risk may change with macroeconomic conditions. During periods of economic stability, concentrations in an institution's portfolio are unlikely to have any noticeable adverse effects on loan performance. However, in an economic downturn, the risks of all connected exposures increase simultaneously (Bandyopadhyay, 2010).

There are several studies concerning macroeconomic effects on loan portfolio performance. Glen and Mondragon-Velez (2011) study on developing countries over the 1996-2008 period suggests that GDP growth and interest rates are the two macroeconomic variables that drive loan portfolio performance. According to Nickell et al. (2000) and Bandyopadhyay (2010), default probability strongly depends on the stage of the business cycle. Den Haan et al. (2007) examined the effect of monetary policy on bank loan portfolios in the United States, observing differences in the behaviour of loan portfolios during monetary and non-monetary shocks. When monetary policy is tight, real estate and consumer loans decrease sharply, whereas commercial and industrial (C&I) loans increase. Conversely, during a non-monetary shock, C&I loans decline sharply, whereas real estate and consumer loans do not exhibit a substantial response.

To absorb possible losses from loan defaults, banks conduct loan provisioning on a continuous basis. Central banks typically implement regulations concerning the minimum loan-loss provisions that banks should make. Such provisions generally consist of two types, namely, specific and general provisions. Specific provisions are intended to cover the possible losses that a bank would suffer from defaults of loans classified as impaired. These provisions are calculated by deducting the realisable value of collateral held against the loans plus other anticipated collectable payments from the face value of the loans. General provisions consist of fixed minimum provision percentages based on all of the loans held by a bank. The purpose of general provision regulations is to ensure that banks always hold sufficient capital to absorb loan losses that cannot be addressed by specific loan-loss provisions alone when unpredictable downside market situations occur (Cronje, 2013).

Research on the linkage between macroeconomic conditions and loan defaults has been conducted by, inter alia, Louzis et al. (2012), Nkusu (2011), and Quagliariello (2007). Relating loan defaults and macroeconomic variables determines the effect of the systemic risk of credit defaults. Business cycles and financial accelerator theory form the basis of such relationships (Nkusu, 2011). According to the theory, non-performing loan ratios tend to be low during economic upturns; as a result, loan-loss provisions are also low during such periods. This relation is supported by Bikker and Metzemakers (2005) and Laeven and Majnoni (2003). Their findings indicate that banks tend to make low loan provisions during favourable macroeconomic periods. Lending standards may be eased based on a favourable economic outlook, in conjunction with increased competition among banks to increase their loan growth during such periods. Research by Quagliariello (2007) confirms that loan-loss provisions are affected by the macroeconomic environment. As such, once economic downturns occur, the non-performing loans and loan-loss provisions increase and more strict lending standards are applied. This negative relationship between non-performing loans and economic growth is also supported by the findings of Marucci and Quagliariello (2008) in Italy and Espinoza and Prasad (2010) in the Gulf Cooperation Council.

Loan-loss provisions are considered to be the "**transmission channels of macroeconomic shocks to bank balance sheets**". The loan-loss provisions are

made against profits "**to adjust the (historical) value of loans to reflect their true value**". In relation to economic/business cycles, the loan-loss provisions may serve as earnings stabilisers. Banks may increase/decrease their loan-loss provisions when their performance deteriorates or improves (Quagliariello, 2007 120). Previous findings from Arpa et al. (2001) and Valckx (2003) provide evidence that banks use loan-loss provisions to smooth their income by creating more provisions when their earnings increase (Quagliariello, 2007). The way in which banks smooth their income using loan-loss provisions is also influenced by their ownership concentration and the regulatory environment in which they operate (Bouvatier et al. (2014). Bouvatier et al. (2014) suggest that banks with higher ownership concentration tend to smooth their income using loan-loss provisions to a greater extent than banks without similar ownership concentration. According to their findings, this behaviour is more common in countries with weaker supervisory regimes.

Shehzad et al. (2010) examine 50 countries from 2005 to 2007 to determine the impact of ownership concentration on non-performing loans. Their findings indicate a negative relationship between ownership concentration and non-performing loans. Thus, ownership concentration reduces banks' non-performing loans. According to Shehzad et al. (2010), one major reason is that the management of banks with high ownership concentration is more closely monitored to protect shareholder rights. Bank risks, as measured by non-performing loans, are therefore reduced.

Hu et al. (2004) examine the relationship between bank types and the non-performing loans of Taiwanese banks during the Asian financial crisis (1996-1999). Their findings show that the relationship between government shareholding in banks and non-performing loans is quadratic (U-shaped). An increase in the government shareholding of banks to as much as 63.51% decreases banks' non-performing loan ratios; however, when the shareholding exceeds 63.51%, the non-performing loan ratios increase.

2.3.2.2 Loan Portfolio Return

Loan interest rates and fees are based on the risk of loans, the cost of funds used to finance the loans, operational expenses and loan provisions (Hogan et al., 2004).

According to Cronje (2013), loan pricing is crucial because of its relationship with bank profitability, loan credit risk and bank capital adequacy. Thus, banks must adopt a loan pricing model that considers the different risk grades of loans. The consistent application of the pricing model/system enables banks to "**compare the risk-return relationship appropriate to different portfolio segments and changes in the pricing thereof could be made**" (Cronje, 2013 96).

The cost-plus method is one of the general methods that banks use to price loans. Recently, there has been a trend towards applying this method to a greater extent in the context of total customer relationship. The pricing is determined by several factors, such as the cost of funds, administrative costs and the borrowers' risk, and by other factors including strategic pricing by the bank to achieve economies of scale and a trade-off between price and volume. The stand-alone pricing model is based on the same consideration of all costs but within the context of a return on the asset (loan). This model considers the cost of reserves and capital, the cost of administering the loan and risk premium (full mark-up cost) and the demand elasticity of the loans (as a measure of market power). In addition to the cost and economies of scale considerations pertaining to the cost-plus and stand-alone pricing methods, other indirect factors such as collateral requirements, loan maturity limits and loan covenants also play important roles in loan pricing. For example, loans with shorter maturities, more restrictive covenants and increased collateral will be priced lower than loans with longer maturities, fewer covenants and less collateral (Hogan et al., 2004).

According to Cronje (2013), other methods include matching competition or adopting price leadership and risk-based pricing. Under matching competition, banks set prime or base rates (rates charged to a bank's most creditworthy customers on short-term loans) that serve as the benchmark for other types of loans. Risk-based pricing is widely known as the risk-adjusted return on capital (RAROC). Interest rates are determined by considering all costs, including the required equity return and loan losses.

The effect of risk on loan pricing has been examined by Repullo and Suarez (2004) and Ruthenberg and Landskroner (2008) in an attempt to assess the effect of the Basel II regulations on loan pricing by banks. Their findings reveal that the risk

profiles of borrowers affect the interest rates charged on loans. The interest rates of low-risk (high-quality) corporate and retail borrowers are lower than those of high-risk customers when they borrow from banks that apply the internal rating-based (IRB) approach in terms of Basel II.

Research on bank interest margins (the difference between interest revenue and interest expenses as a percentage of total assets) by Ho and Saunders (1981) extends and integrates the hedging hypothesis[19] and microeconomics of the (banking) firm model to analyse the determinants of bank margins. In their model, Ho and Saunders indicate that the bank margins or spreads always exist as a result of the uncertainty encountered by banks and depend on the degree of managerial risk aversion, the size of transactions undertaken by banks, bank market structure and the variance of interest rates. The findings indicate that bank interest margins are determined by the degree of competition in the market and interest rate risk.

Angbazo (1997) extends the Ho and Saunders model to include default risk and its interaction with interest rate risk. The findings suggest that default risk is a significant determinant of the net interest margins of large banks. Allen (1988) also extends the Ho and Saunders model by including loans and deposits with various maturities to analyse the impact of interest rate risk on the net interest margins for loan portfolios. Allen's theoretical approach is empirically applied to European banks by Valverde and Fernandez (2007) and to Asia by Lin et al. (2012). In both cases, the authors use the total interest income and expenses of the banks, not merely those applicable to loans. Lin et al. (2012) demonstrate that the diversification of income sources (not only loans) leads to more stable net interest income. This finding suggests that diversification reduces the net interest income shock from idiosyncratic risk.

The empirical research findings regarding loan portfolios discussed in this section are summarised in Table 2.5.

[19] The hedging hypothesis involves matching the maturities of assets and liabilities to hedge against interest rate fluctuations.

Table 2.5 Loan Portfolios: Empirical Research Findings

Author	Country and Period	Loan Portfolio Variables	Performance Variables	Main Results
Winton (1999): A Modelling Approach	US Banks, 1970-1990	Composition by sectors	Risk and Return	Institution's credit risk depends on diversification and monitoring incentives. It does not always result in reduced risk of failure
Acharya, Hasan and Saunders (2002)	105 Italian banks, 1993-1999	Portfolio composition by industrial sector, broad aset sector, and geographic	Return and Risk	Diversification of bank assets is not guaranteed to produce superior performance and/or greater safety for banks
Pfingsten and Rudolph (2002)	7 German bank groups, June 1970-June 2001	Concentration Risk/ diversification based on Industry	-	There is a trend toward diversification based on bank group analysis. A discrepancy exists in lending across sectors related to the ownership structure and size of group of banks under public law
Kamp et al. (2005)	2218 German banks, 1993-2002	Loan Portfolio Composition: Diversification	-	Majority of banks (credit cooperative and savings banks) increased loan portfolio diversification while regional banks and subsidiaries of foreign banks tend to be more focused
Den Haan et al. (2006)	US banks, Q1 1977-Q2 2004	Loan Portfolio Composition	Monetary Policy Transmission	Different loan portfolio behaviour exists between monetary and non-monetary downturn
Dullmann and Masschelein (2006)	2224 German banks, September 2004	Business-sector concentration	Economic Capital	Low granularity ceteris paribus causes the analytic approximation formulae to underestimate economic capital, whereas heterogeneity in individual probability of defaults causes over-estimation
Hayden (2006)	985 German banks, 1996-2002	Portfolio composition by industries, broad economic sectors, and geographical regions	Return and Risk	No large performance benefits can be associated with diversification since each type of diversification tends to reduce the banks' returns. Impact of diversification depends strongly on the risk level
Behr et al. (2007)	2231 German banks, 1993-2002	Portfolio composition based on economic sectors	-	Concentration increases banks' returns and decreases loan loss provision and non- performing loans
Berger et al. (2010)	88 Chinese banks, 1996-2006	Portfolio diversification based on geographic, loans, deposits and assets types	Profits, Costs and Efficiency	Diversification lower profits, increase costs, reduce profit and cost efficiency
Aver (2008)	Slovenian banks, 31 December 1995 -30 November 2002	Systematic risk	Macroeconomic Variable	Credit risk of the loan portfolio depends on the unemployment rate, interest rate and stock exchange index

Table 2.5 Loan Portfolios: Empirical Research Findings (continued)

Author	Country and Period	Loan Portfolio Variables	Performance Variables	Main Results
Dietsch and Petey (2009)	French SMEs, 1999-2008	Concentration loan on SMEs across sectors	Capital and Risk (Taboada)	Standard one factor model&internal-ratings based regulatory formula fail to capture concentration risk
Langrin and Roach (2009)	15 banking institutions in Jamaica, 2000-2007	Portfolio concentration	Risk and Return	Diversification does not imply lower risk and / or greater returns
Rossi et al. (2009)	125 large Austrian commercial banks, 1997-2003	Portfolio composition: diversification based on economic sectors and loan book granularity	Risk, cost and profit efficiency	Although diversification negatively affects cost efficiency, it increases profit efficiency and reduces realized bank risk. It seems to have a positive impact on banks' capitalization
Bandyopadhyay (2010)	2 Leading public sector Banks in India, 2002-2009	Portfolio Composition by industry, zone-wise, region wide, rating wide	Economic Capital (RAROC, EVA)	A large bank does not necessarily have risk diversification benefits in its credit portfolio compared to a mid-sized bank. The bank's portfolio risk depends upon sectoral and regional performance of credit
Tabak et al. (2011)	96 commercial banks, January 2003-February 2009	Portfolio composition: diversification strategy	ROA and ROE	Loan portfolio concentration increases returns and also reduces risks for foreign banks. State-owned banks seem to be less affected by the degree of diversification
Louzis et al. (2012)	9 largest Greek banks, Q1 2003-Q3 2009	Macroeconomic variables and bank specific variables	Non-Performing Loans (NPLs)	NPLs for all loan categories can be explained mainly by macroeconomic variables and management quality. Non-performing mortgage loans are the least responsive to changes in macroeconomic conditions
Mencia (2012)	Spain, Q4 1984- Q4 2008	Loan Composition	Risk and Return	Mean-Variance is empirically consistent with the maximisation of a constant relative risk aversion utility function

2.4 Bank Ownership Types and Loan Portfolios

Different bank ownership types may focus on different borrowers (De-Haas et al., 2010). Loan portfolio compositions depend, inter alia, on banks' organisational structures, access to liquidity, exposure to asymmetric information (Degryse et al., 2012), motives, technology and innovation capacity (Berger et al., 2005).

The research findings provided in Section 2.2.2 highlight significant differences in bank characteristics across the major bank ownership types (government-, domestic-, and foreign-owned banks).

Considering these findings, it is evident that:

a) Government-owned banks often engage in connected lending with low credit availability to other borrowers, have high risk exposure linked to non-performing loans, and exhibit low profit and cost efficiency. In addition, their loan portfolio compositions and performances differ from those of the other bank ownership types.
b) Domestic-owned banks generally engage in more aggressive lending, have higher portfolio risks than foreign banks, possess limited access to external liquidity, and possess better local market knowledge.
c) Foreign-owned banks apply stricter credit assessments than banks of other ownership types, have advanced risk management technology, and possess superior access to capital markets and technology.

Degryse et al. (2012) examined data from 110 Polish banks and observed differences in the loan portfolio composition for different bank ownership types. Their findings also indicate that foreign-owned banks charge lower interest rates and have lower interest rate spreads. The lending rate difference is caused by the differences in loan portfolio compositions across bank ownership types.

De-Haas et al. (2010) studied 220 banks in 20 transition countries. Using ordinary least squares regression, they confirmed differences in loan portfolio composition across different bank ownership types. Loan types such as consumer lending, small and medium enterprise lending, lending to large enterprises, and lending to state-owned enterprises were applied as variables. The results indicate that government-

owned banks lend more to government-owned enterprises than do domestic- and foreign-owned banks. Foreign-owned banks focus on mortgage lending and lending to the subsidiaries of international firms, whereas their focus on foreign customers is limited to the corporate segment. The research did not include an analysis of different economic sector categories; however, this may be because of a lack of available micro-level data to conduct such an analysis.

Other research concerning the relationship between bank ownership types and loan portfolio composition could not be retrieved, thus emphasising the importance of conducting further research in this regard.

2.4.1 Specific Research Findings in Asia and Indonesia

Authors who have conducted research on bank ownership types in Asia include Montgomery (2003), Unite and Sullivan (2003), Mian (2006), and Tandelilin et al. (2007), whereas Berger et al. (2010), Bandyopadhyay (2010), and Pennathur et al. (2012) focused on portfolio composition and risk.

Montgomery (2003) compared domestic and foreign banks in Asian countries and observed that foreign banks perform worse than their domestic counterparts with respect to return on equity, cost to income ratios and the percentage of non-performing loans. In addition, foreign banks tend to focus on niche markets such as foreign exchange and derivatives trading, the global underwriting of bonds and equities, cross-border mergers and acquisitions, trade finance and investment management services.

Focusing on foreign bank entry in the Philippines, Unite and Sullivan (2003) found that domestic-owned banks affiliated with a family business group experienced a decline in interest rate spreads and bank profits after the entry of foreign-owned banks. This finding indicates that the presence of foreign-owned banks increases competition and can affect the portfolio composition and pricing of domestic-owned banks.

Berger et al. (2010) examined the impact of loan, deposit, asset and geographic diversification on Chinese bank performance, confirming that diversification in all four areas reduced profits and increased costs. However, the negative impact of

diversification (reduced profits and increased costs) was less for foreign-owned banks, with even minority foreign ownership contributing significantly to efficiency. Another study by Pennathur et al. (2012) on Indian banks investigated the risk-return trade-offs from income diversification across different bank ownership types. Their findings indicate significant differences between bank ownership types with respect to non-interest income. Also focusing on Indian banks, Bandyopadhyay (2010) examined concentration risk and its impact on bank capital based on loan portfolio data for large and medium-sized public-sector banks. His findings confirm the feasibility of the economic capital approach in assessing the impact of regional, industry and individual concentration. Lin et al. (2012) study of nine Asian countries and loan portfolio risks suggests that the net interest margin shock linked to unsystematic risk can be reduced by diversifying bank income sources.

Tandelilin et al. (2007), who studied the relationship among bank ownership structures and types, risk management and bank performance in Indonesia, found that the risk management and bank performance of Indonesian banks are sensitive to bank ownership types.

Other research on the Indonesian banking sector focused on bank efficiency and market discipline. Focusing on bank efficiency and productivity, Hadad et al. (2011) found that the average bank efficiency was reasonably stable during the sample period (from Q1 2003 to Q2 2007) and that technological progress was the main driver of productivity improvements, as indicated by Malmquist's results. Other research by Hadad et al. (2011) considered the impact of regulatory changes on market discipline during the period 1995–2009. The study found a decline in market discipline following the introduction of the blanket guarantee scheme and the adoption of limited guarantees in a recovering economy that mitigate the role of market discipline. Market discipline is more pronounced among listed banks than unlisted banks and among foreign-owned banks than among domestic-owned banks.

Based on the aforementioned review, there is no study to date that has empirically analysed the relationship between bank ownership types and their loan portfolio compositions in Indonesia, despite the fact that Indonesia experienced massive changes in its bank structures after the financial crises and underwent a substantial

banking reform process. This research gap provides a meaningful opportunity to conduct such a study concerning Indonesia.

2.5 Summary

The literature reviewed in this chapter provides evidence of dissimilarities in the performance and loan portfolio compositions of banks of different ownership types. Research findings concerning the risks of loan portfolio compositions also differ, with some findings indicating that loan portfolio diversification need not lead to improved risk-return relationships and that focussed portfolios could perform better.

Although the abovementioned research examined numerous developed and emerging countries, no such studies on Asian countries could be retrieved. To measure bank performance, the majority of the studies use bank financial data that can be accessed from a database such as Bankscope or OSIRIS.

Although researchers have conducted comprehensive studies on the impact of ownership types on bank performance, they have not compared these effects in terms of loan portfolio composition such as products or sectoral market segments. This study extends the literature to determine the impact of ownership types, loan portfolio composition and loan risk on bank performance. To date, no such study has been performed in Indonesia, despite the country's substantial banking reforms after the devastation of the 1997/1998 financial crisis.

Accordingly, this research contributes to the body of academic literature by considering bank-level information on loan portfolio composition and performance and relating it to bank ownership types. This type of micro-data will contribute to an understanding of the internal decisions of different bank types and the resulting performance thereof. This research will also serve as a source of empirical evidence of changes in bank loan portfolios and performance in Indonesia over the period 2003-2011. It is expected to enhance regulation regarding bank risk management and capital requirements, accounting for the differences among bank ownership types in Indonesia, as well as individual bank loan portfolios and performance. This study provides input toward the improvement of portfolio strategies by considering risk and return findings and recommendations emanating from the results. Moreover, the

research will provide information that could assist in the implementation of measures to enhance required financial intermediation in sectors of the economy in which inadequacies exist or specific growth is required.

The next chapter will provide an overview of the Indonesian banking industry and discuss the stages of Indonesian deregulation and reregulation with a focus on banking ownership structures and loan portfolio regulations.

Chapter 3

THE INDONESIAN BANKING INDUSTRY

3.1 Introduction

A thorough overview of research conducted on different bank ownership types and bank loan portfolio management was provided in the previous chapter.

The Indonesian banking industry is a major component of the financial system, holding 80% of the Indonesian financial system's total assets in 2009 (PwC Indonesia, 2012). As the main provider of financing, the industry serves as the country's economic driver in accelerating economic growth. The banking industry has undergone significant changes since its establishment in 1953 (eight years after Indonesian independence in 1945). From a legal heritage perspective, the prevailing banking system is based on civil law[20]. The legal system was established with the Dutch colonisation of Indonesia at the beginning of the eighteenth century and was retained as the official law system after independence in 1945.

As the official supervisor of banks, the central bank must ensure that banks apply prudential principles. According to Ciancanelli and Gonzales (2000), banks are highly leveraged institutions with low equity levels. Because the majority of bank funding originates from small depositors, it is unsurprising that banks are subject to numerous government regulations, which are primarily intended to protect the interests of small depositors. Strong banking regulatory and supervisory policies are important because they ensure the viability and health of the banking industry and provide a means of conducting interest rate liberalisation (Villanueva and Mirakhor, 1990). To monitor the banking industry, Indonesia employs a system of public regulation in the hands of the government (Adiningsih, 1996).

[20]Civil law, a legal system that originated in Western Europe, is intellectualised within the framework of late Roman law. Its most prevalent feature is that the core principles are codified into a referable system that serves as the primary source of law (http://en.wikipedia.org/wiki/Civil_law_(legal_system)).

The present central bank, Bank Indonesia[21], officially began operations in 1968. The central bank is responsible for maintaining the stability of the Indonesian Rupiah (IDR), controlling the circulation of money in Indonesia, and improving the development and supervision of credit affairs (Bennet, 1995). Bank Indonesia establishes interest rates for loans and deposits and controls the lending activities of government-owned banks by setting credit ceilings. It operates independently from the government, as stated in all of the following central bank acts: Acts No. 11/1953, 84/1958, 13/1968, 23/1999, 3/2004, and 6/2009 (Republik Indonesia, 1953, Republik Indonesia, 1958, Republik Indonesia, 1968, Republik Indonesia, 1999b, Republik Indonesia, 2004, Republik Indonesia, 2009). Bank Indonesia also has the authority to licence banks based on Act No. 23/1999 (Republik Indonesia, 1999b). Before 1999, this authority rested with the Indonesian Ministry of Finance.

The duties of Bank Indonesia entail the formulation of regulations, the granting and suspending of bank licences, the supervision of banks and the imposition of sanctions on banks. To conduct these duties, Bank Indonesia has the right to regulate, licence, control and sanction. Bank Indonesia's supervisory role consists of compliance-based supervision and risk-based supervision. Bank Indonesia is gradually shifting its emphasis from compliance-based supervision towards risk-based supervision because the latter is considered to be more appropriate for responding to the present turbulent economic environment (Bank Indonesia, 2011b).

As of 1 January 2014, Bank Indonesia's supervisory role was transferred to another party, the financial service authority (OJK), in accordance with Act 21/2011. The OJK supervises banks and other financial institutions, whereas Bank Indonesia retains all roles except supervision. These roles emphasise the importance of close integration between Bank Indonesia and the OJK (PwC Indonesia, 2012).

Since its post-colonial establishment in 1953, the Indonesian banking sector has undergone tremendous deregulation and reregulation, liberalisation and de-liberalisation. In this chapter, the way in which regulation and deregulation affect different bank ownership types and bank loan portfolios will be discussed in the

[21]Bank Indonesia is the central bank in terms of Act No.13 of 1968. It replaced the De Javasche Bank, which was established on October 10, 1827, and nationalized in 1951 by Law No. 24 of 1951. Through Law No. 11 Year 1953 (Basic Law of Bank Indonesia, 1953), The De Javasche Bank Act of 1922 was repealed, and Bank Indonesia became the central bank (Suyatno et al., 1999).

following sequence, with a primary focus on the post-Asian crisis period (2002 onwards):

- The Policy Regime and Structure Before the 1980s
- Reform Packages in the 1980s
- Bank Laws and the Asian Financial Crisis in the 1990s
- Prudential Regulations in the 2000s

3.2 Policy Regime and Structure before the 1980s

Based on Banking Act No. 14/1967 (Republik Indonesia, 1967), banks in Indonesia were classified into groups using the ownership and functions of the banks as the primary classification criteria. Classification based on ownership consisted of the following: national government banks; regional development banks; private (domestic and foreign) banks; and cooperative banks[22]. Based on functions, the five types of banks included the central bank, commercial banks, savings banks, development banks, and rural banks[23]. Table 3.1 below summarises the categorisation of Indonesian banks based on Banking Act No. 14/1967.

[22]Local government-owned banks were regional development banks at the provincial level that were established in terms of Law No.13/1962. Private-domestic banks were banks with shares owned by Indonesian citizens and/or Indonesian legal entities, which were owned and governed by Indonesian citizens, based on Minister of Finance Decree No. Kep/603/M/IV/12/1968. Some of these banks were foreign exchange banks that were allowed to conduct foreign-exchange transactions (buying and selling foreign exchange and overseas collection and transfers including letters of credit (L/C) activities). Privately owned foreign banks were branches of foreign banks or banks of which the shares were owned jointly by foreign and Indonesian entities, based on Minister of Finance Decree No. Kep/034/MK/IV/2/1968. Cooperative banks were the banks for which funds originated from cooperative groups, based on Minister of Finance Decree No. Kep.800/MK/IV/II/1969.

[23]The central bank is Bank Indonesia, established under Law No.13/1968, whereas commercial banks are the banks that collected funds in the form of chequing accounts and savings deposits and provided short-term loans. Saving banks include banks that accumulate funds received from savings and, particularly, in the form of securities. Development banks include banks that collect funds, especially in the form of deposits or securities, and provide medium- and long-term loans for development purposes. Rural banks accept deposits in the form of money and natura (rice, corn, etc.) and provide short-term loans in the form of money or in natura to agricultural sectors and rural areas (Suyatno et al., 1999).

Table 3.1 Categorisation of Indonesian Banks Based on Banking Act No.14/1967 Introduced in Year 1968

No	Bank Ownership Types	Functions	Legal Foundation	Number of Banks*	Activities Performed	Remarks
1	National Government –owned banks • Bank Negara Indonesia 1946 • Bank Dagang Negara • Bank Bumi Daya • Bank Rakyat Indonesia • Bank Ekspor Impor Indonesia	Commercial bank Commercial bank Commercial bank Commercial bank Commercial bank	Act No 17/1968 Act No 18/1968 Act No 19/1968 Act No 21/1968 Act No 22/1968	7	Commercial banks • taking deposits • giving credit • moving money • payment • buying and selling securities • bank guarantees • storage of valuables • others	
	• Bank Tabungan Negara	Savings Bank	Act No 20/1968		Savings banks • taking deposits • investments • granting credit up to certain amounts as percentage of total deposits • disburse mortgage loans	
	• Bank Pembangunan Indonesia	Development Bank	Act No 21/1960		Development banks • taking deposits • issuing medium and long term securities • granting medium and long-term loans (and short-term, under special consideration) • granting investment loans • granting domestic loans • generating foreign loans, denominated both in domestic and foreign currency • others	

Table 3.1 Categorisation of Indonesian Banks Based on Banking Act No.14/1967 Introduced in Year 1968 (continued)

No	Bank Ownership Types	Functions	Legal Foundation	Number of Banks*	Activities Performed	Remarks
2	Regional Government-owned banks	Development Bank	Act No 13/1962	27	Similar to national government-development banks, but limited to local areas (its own province)	Each province has its own bank
3	Private- owned banks • Domestic	May take the form of: • Commercial Bank • Savings Bank • Development Bank	Minister of Finance Decree No.Kep/603/M/IV/12/1968	70	Similar to national government-banks	10 banks obtained the licence to perform foreign exchange operation
	• Foreign	May take the form of: • Commercial Bank • Savings Bank • Development Bank	Minister of Finance Decree No. Kep/034/MK/IV/2/1968	10	Notes for foreign and joint-venture banks: • No deposit taking • Focus on medium and large business Act as supplementary lenders	Foreign banks were restricted to only operate in Jakarta
	• Joint Venture	May take the form of: • Commercial Bank • Savings Bank • Development Bank	Minister of Finance Decree No. J.A 5/15/11	1		On 26 September 1965, there was one partnership bank between an Indonesian and Japanese bank: Bank Perdagangan Indonesia (Perdania)
4	Cooperative banks	May take the form of: • Commercial Bank • Savings Bank • Development Bank	Minister of Finance Decree No. Kep. 800/MK/IV/II/1969	1	Similar to national government-banks	Bank Umum Koperasi (BUKOPIN) is the only cooperative bank which was established in 1987

* As of 1968, Source: Suyatno et al. (1999), with further adjustments

Major reform of the banking industry commenced with the enactment of Banking Act No 14/1967. This legislation enabled foreign-owned banks to access the Indonesian market, in the form of branches and representative offices, after they had been expelled in the 1950s (McLeod (1996) and Montgomery (2003)). Ten foreign-owned banks established branches in Indonesia; however, their operations were restricted to the Indonesian capital city and only two offices with no deposit-taking activities (McLeod, 1996). Their presence was primarily allowed to supplement the supply of capital to medium-sized and large businesses (Suyatno, 1999). The permission for foreign-owned bank entry did not last long. In 1969, the government again banned new foreign-owned bank entries (Montgomery, 2003) and continued the ban until 1988 (Harun, 2008).

From 1965 to 1968, the Indonesian system followed a mono-bank model, wherein Bank Indonesia performed the combined roles of central and commercial banking[24]. One year after reforms began in 1967, seven separate government-owned banks were established, each governed by its own law (see Table 3.1). These banks were established to develop specific sectors of the national economy[25] with a specific segment allocation for each one.

Government-owned banks dominated banking throughout the 1970s. Although the foreign-owned bank branches that had been established in 1968 continued to exist, the industry remained closed to new entrants. As a result, government-owned banks did not face competition from other banks (Bennet, 1999). Policy makers often required these banks to direct their loans to certain customers. This requirement was known as "**memo lending**" or "**lending on the basis of a recommendation from a prominent or politically well-connected person**" (Bennet, 1995 447). Senior politicians appointed the high-ranking officials of the state-owned banks. Thus, to maintain their job security, the officials compromised

[24]This integration was based on Presidential Decree No. 17 of 1965, and the subsequent disintegration occurred with the enactment of Law No. 13 of 1968 (Suyatno et al., 1999).

[25]The specific sectors/activities served by each of the seven newly formed government-owned banks were as follows: Bank Negara Indonesia - manufacturing, Bank Dagang Negara - mining, Bank Bumi Daya - agriculture and forestry, Bank Rakyat Indonesia - agriculture and fishing, Bank Ekspor Impor - foreign trade, Bank Tabungan Negara - national savings, and Bapindo - national development (see Bennet, 1995).

bank loan portfolio quality. Memo lending resulted in improper loan assessment, which led to the provision of loans to non-credible companies that did not have the capacity to repay the loans. Further, McLeod (1996) notes that the lending policy of government-owned banks targeted government enterprises that were obliged to rely on government-owned banks not only for their financing but also for their investments.

In 1974, the government introduced control over bank lending as a major element of the banking policy regime (Arndt 1974, quoted in McLeod (1996)), establishing interest rate ceilings for different economic sectors. Bank Indonesia therefore directed the allocation of bank credit to different sectors (Chant and Pangestu, 1994).

During the oil boom, state-owned banks received funding from Bank Indonesia at low interest rates, enabling the banks to grant loans to economic sectors at a low rate. The government intended for the mechanism to spread the income generated from oil to certain designated sectors. This approach enhanced the fulfilment of social motives by government banks (McLeod, 1996).

Increasing inflation (from 7 % in 1978 to 30 % in 1979)[26], in conjunction with destabilising capital outflows resulting from expectations of currency devaluation, led to high and volatile domestic interest rates that exceeded the return on other investment alternatives. This type of economic environment was followed by a deterioration in the financial performance of entities in the private sector.

3.3 Reform Packages in the 1980s

During the 1980s, two deregulation packages were introduced, namely, the June 1983 reform package and the October 1988 package. Both were intended to increase the level of competition in the Indonesian banking industry. In addition, the packages were introduced to reduce direct government control over interest rates and loan allocations (Bennet, 1999). The result was an increase in the number of banks and growth in total bank assets.

[26] See McLeod (1996, p. 4)

The ‘June 1983 Package’

Before 1983, Indonesia experienced ‘financial repression’ because of the imposition of interest rate ceilings, high reserve requirements and selective credit ceilings. These regulations resulted in the distortion of the capital market (Harun, 2008). This situation, combined with a sharp decline in oil prices (the primary source of Indonesian export income) in 1982, required actions from the government to create more efficient banking. To solve the problem, Bank Indonesia eliminated interest rate ceilings on bank deposits and loans in 1983. However, Adiningsih (1996) and Bennet (1999) indicate that the liberalisation was implemented during unstable macroeconomic conditions, resulting in financial instability that led to banking panics in the early 1990s.

The primary objectives of the reforms were to cease the government-subsidised lending programme and to create a more market-oriented banking system. The reform process consisted of terminating government-owned bank liquidity credit, removing interest rate controls (as a consequence of the termination of the subsidised lending programme), and abandoning lending controls (Mc Leod, 1996).

Lending control was abandoned in an attempt to enable government-owned banks to make independent loan portfolio decisions based on their ability to attract deposits. The new approach also forced government-owned banks to compete with other banks because subsidised interest rates no longer existed. However, the government-owned banks applied a higher interest rate margin. As a result, their loan market share fell from 71 % to 62 % between 1983 and 1987 (Mc Leod, 1996).

Furthermore, Bank Indonesia continued to provide a high volume of loans to government-owned banks (Mc Leod, 1996). There was little improvement in the efficiency of government-owned banks, which maintained their focus on serving government-owned enterprises and neglected retail markets (Cole and McLeod, quoted in McLeod, 1996).

The 'October 1988 Package'

The October 27, 1988 policy package, known as "Paket Kebijakan Oktober 1988" or PAKTO 1988, deregulated the bank entry and licencing requirements by relaxing the requirements to become a foreign exchange bank[27] and open bank branches. The primary aims of this deregulation scheme were to increase the level of competition in the banking sector and to enhance credit availability throughout the country. Bank Indonesia's reserve requirement for banks decreased from 15 % to 2 %. The capital requirement for establishing a new bank was reduced to only 10 billion IDR, the equivalent of US $ 4.33 million at that time (Harun, 2008). Many of Indonesia's business conglomerates opened private-owned banks to extend loans to affiliated companies (Mc Leod, 1996). Although new bank establishment requirements were deregulated, the government continued to impose control on lending through lending limit[28]regulations (Harun, 2008).

The 1988 deregulation granted foreign banks permission to open sub-branches in seven major cities/islands in Indonesia: Surabaya, Semarang, Bandung, Medan, Ujung Pandang, Denpasar, and Batam. Furthermore, the government allowed foreigners and Indonesian citizens to establish joint-venture banks. Within one year after bank establishment, loans allocated to support export activities had to constitute at least 50 % of the joint-venture bank's total loan portfolio.

The 1988 package relaxed numerous bank establishment regulations to foster competition in the banking industry. As a result, the Indonesian banking industry experienced an accelerated increase in the number of banks. During the 1988-1991 period, 58 new banks were established. The 61 banks that had existed in

[27] A foreign-exchange bank is licenced to conduct foreign exchange transactions. A bank must satisfy certain capital requirements to become a foreign-exchange bank

[28] The legal lending limits were as follows: to an individual borrower, 20 % of a bank's capital; to an affiliated group of companies, 50 % of the bank's capital; to a member of the bank's board of directors or supervisory board who is not a shareholder of the bank, 5 % of bank capital; to a member of the bank's board directors or supervisory board who is not a shareholder of the bank and to an affiliated group of companies owned by such a board member, 15 % of the bank's capital; to a shareholder of the bank or a company owned by a shareholder, 10 % of the shareholder's equity holding in the bank; to a shareholder of an affiliated group of companies owned by a shareholder, 25 % of the shareholder's equity holding in the bank; and to directors or employees of the bank, various percentages based on the individual's remuneration from the bank and ability to repay.

1988 increased to 119 by 1991. Domestic-owned bank branches increased dramatically, from 559 in 1988 to 2,639 at the end of 1991 (Pangestu, 2003). These domestic-owned banks were better able to perform intermediary functions than government-owned banks. Government-owned banks no longer dominated the market.

Foreign-owned banks also became more prominent after the 1988 reforms. Their number increased from 11 in 1988 to 29 in 1991 (Pangestu, 2003). These banks began to offer retail-banking services in addition to their former focus on corporate accounts.

Indonesian banks engaged in risky lending practices following the deregulations. Government-owned banks provided politically motivated loans, whereas domestic-owned banks engaged in intra-group lending. In many cases, there were inadequate loan assessments (Bennet, 1999).

Domestic-owned banks primarily made loans to affiliated companies, which led to high-risk exposure arising from highly correlated risk between the bank and the borrowers, all of which were in the same corporate groups. These banks used various means to fund affiliated companies in excess of the lending limit regulations. The types of credit support provided by such domestic-owned banks to their affiliates included direct loan guarantees and more sophisticated financial instruments such as total return swaps and credit default swaps, under which the risks of the loans were passed from an unrelated third-party lender to the affiliated bank. In many cases, inadequate loan assessment was conducted (Bennet, 1999).

3.4 Bank Laws and the Asian Financial Crisis in the 1990s

The period from the introduction of the 1988 banking package until the 1997 Asian financial crisis was characterised by the application of orthodox free-market economic principles, according to which the government liberalised the market to increase competition, reduce government-owned bank domination and employ market mechanisms to set interest rates and loan allocations (Bennet, 1999). The extensive growth in the number of banks during this period was accompanied by

challenges. The majority of the government- and domestic-owned banks did not perform adequate risk management and thus tended to engage in risky lending practices. As a result, banks experienced high levels of non-performing loans (Bennet, 1999). The asset quality of both government-owned and private-owned banks deteriorated significantly. At the end of 1993, the non-performing loans of the largest government-owned banks reached 21 % of total loans (Bennet, 1999). There were no deposit insurance schemes in Indonesia at that time. Bank Indonesia served as the lender of last resort and protected the large government-owned banks under the "too-big-to-fail" policy.

From a regulatory perspective, the accelerated growth in the number of banks after the 1988 reform was not accompanied by effective supervision. The combination of prevailing bank practices and the lack of regulatory supervision resulted in imprudent behaviour by the banking industry.

In a retrospective response, the government announced two banking policies (the Improvement of Bank Supervision of February 28, 1991 and the Improved Banking Regulation of May 25, 1993) that changed existing bank legislation.

The primary goal of the February 1991 policy was to slow credit market expansion. The policy regulated risk-adjusted capital adequacy ratios, loan-loss provisions, and discount rates for open market instruments. In addition, it addressed the requirements regarding the establishment of new bank branches and offices (including overseas branches) and introduced stricter requirements for persons/entities to become bank managers, members of boards of commissioners and bank owners (Adiningsih, 1996). Banks were also asked to merge or consolidate; however, because of the lack of enforcement by Bank Indonesia, a wide-scale banking consolidation did not occur at this stage (Batunanggar, 2002).

Banking Act No. 7/1992 shifted the classification of banks in terms of functions to three groups, namely, the central bank, commercial banks and rural credit banks[29] (Republik Indonesia, 1992). Commercial and rural credit banks were allowed to

[29]Rural credit banks do not participate in the payment system and do not operate similarly to commercial banks.

conduct conventional (non-sharia) business and sharia-based business.[30]The former saving banks were integrated into the central bank, and development banks were regarded as commercial banks.

Banking Act No. 7/ 1992 was introduced in October 1992. Regulations for government-owned banks and non-government-owned banks were aligned to create a more competitive banking industry. The legal status of government-owned banks was transformed to limited liability companies to become private corporations (Pangestu, 2003). In addition, foreigners were now allowed to directly purchase all types of available bank shares in the capital market.

Banking Act No. 7/1992 limited bank lending activities by imposing new maximum lending limits. It also contained tighter requirements for bank licencing and abolished government-owned bank obligations to allocate credit to support government projects (Harun, 2008). Strict penalties for violating the law were introduced and applied to bank owners, managers and commissioners. Pangestu (2003) suggests that notwithstanding the strict penalties, law enforcement efforts were unsuccessful because of the limited capacity and capability of bank supervisors. Corruption and political interference by certain bank owners who had close connections/relationships with the supervising authorities also hampered the enforcement efforts.

Capital requirements were increased for the establishment of new domestic banks (five times the original capital requirements) and for joint venture banks (double the original capital requirements) in October 1992 (Republik Indonesia, 1992) in an effort to temper the increase in bank numbers (Pangestu, 2003).

In the second quarter of 1993, the non-performing loans of all banks represented between 5 and 20 % of their total loan exposures, with government-owned banks experiencing a 360-per-cent increase in their non-performing loans since 1990 (Adiningsih, 1996). To resolve this problem, the government needed to formulate policies to create strong and credible stabilisation programmes that could

[30]Sharia banks apply Islamic principles in banking.

stimulate the private sector and strengthen the prudential supervision of the banking sector (Villanueva and Mirakhor, 1990). The May 1993 policy changes eased the capital requirements for new banks but increased the required portion of retained earnings in core capital and tightened the legal lending limits to single entities/groups of entities to reduce banks' concentration risk. Notwithstanding these changes, the financial indicators did not show improvement because of the effect of previous imprudent behaviour (Harun, 2008).

The ownership of domestic banks could often be regarded as highly concentrated. Table 3.2 depicts data from 10 major domestic banks whose owners were single families or company groups. Further, government-owned banks were affiliated with other banks and financial institutions through cross-shareholding and management (Kameyama et al., 2005).

Concentration also existed in bank sizes. Seventy-five % of total bank assets were held by 16 banks, including 10 non-government-owned domestic banks and 6 government-owned banks (Pangestu, 2003). The ownership concentration for both government-owned and non-government-owned domestic banks created conflicts between majority shareholders (families or company groups) and minority shareholders (Pangestu, 2003). In addition, banks did not always provide accurate information disclosure as required by the supervisor. The problem worsened because of the weak capacity and capability of supervisors, who engaged in collusive practices and political interference (Pangestu, 2003).

Table 3.2 Ownership of Ten Major Domestic-owned Banks at 31 December 1996 (Assets in Trillion IDR)

Banks	Total Assets	Owner	Core Business
Bank Central Asia	35.3	Salim Family (Salim Group)	Cement, Automotive, Food
Bank Danamon	21.9	Usman Admadjaja Family (Danamon Group)	Property, Bank
Bank Internasional Indonesia	16.7	Eka Tjipta Widjaja Family (Sinar Mas Group)	Paper, Food
Bank Dagang Negara Indonesia	16.5	Sjamsul Nursalim Family (Gajah Tunggal Group)	Property, Finance, and Tyre
Lippobank	10.2	Mochtar Riyadi Family (Lippo Group)	Finance, Property
Bank Bali	7.6	BaliFinancial Business Group	Finance
Bank Niaga	7.3	Tirtamas Group	Cement, Finance
Bank Umum Nasional	7.1	Bob Hasan/ Ongko Group	Agrobusiness and Property
Panin Bank	5.4	Mu'Min Ali Gunawan	Property and Finance
Bank Duta	5.2	Bob Hasan/ Sigit H Soeharto (Berdikari Group)	Agrobusiness and Plywood

Source: Alijoyo et al. (2004)

The vulnerability of banks triggered a banking crisis when Indonesia experienced a currency crisis following the implementation of a free-floating exchange rate for the IDR on August, 14 1997 (Batunanggar, 2002). The decision to completely float the IDR was taken after a series of interventions by Bank Indonesia from June, 13 1996 until July, 11 1997 to gradually widen the exchange rate movement of the IDR from 3% to 11%. These gradual interventions failed to strengthen the IDR's value (Harun, 2008). As the currency crisis spread, banks that had already suffered liquidity problems experienced a further increase in their liquidity risk based on substantial maturity mismatches of assets and liabilities resulting from the use of short-term foreign currency borrowings for medium-term and long-term IDR loans. Banks were unable to repay their foreign currency loans as the IDR depreciated sharply. Moreover, the market liquidity continued to tighten because of the introduction of tighter monetary policy. The banking system soon faced a severe liquidity crisis with overnight interest rates that increased to 300 % per annum. The condition exerted further pressure on small domestic-owned banks as

customer confidence in the small banks deteriorated. For safety reasons, the customers began to transfer their deposits from the small domestic-owned banks to government-owned banks and foreign-owned banks (Batunanggar, 2002).

Sixteen banks were closed in November 1997. On January 27, 1998, in an effort to address the country's financial crisis, the government established the Indonesian Banking Restructuring Agency (IBRA)[31], under Presidential Decree No. 27/1998, to supervise the bank restructuring process (Alijoyo et al., 2004). The restructuring of the banking sector that followed took the form of bank liquidations, bank mergers, bank closures, and bank recapitalisation at a substantial cost to the government (Alijoyo et al. (2004) and Batunanggar (2002)). Having been severely affected by the 1997 financial crisis, Indonesia also raised the limit of foreign ownership in non-government-owned domestic banks to 99 % through regulation No 29/1999 because many of the private-owned domestic Indonesian banks were not financially able to participate in the recapitalisation programme (Montgomery, 2003).

Batunanggar (2002) summarises the government's restructuring intervention between November 1997–2000 as follows: (i) the closure of 16 small banks in November 1997; (ii) intervention[32] to address the problems of 54 banks in February 1998; (iii) the takeover of 7 banks and the closure of another 7 in April 1998; (iv) the closure of four banks previously taken over in April 1998 and August 1998; (v) the closure of 38 banks together with a takeover of 7 banks and joint recapitalisation of 7 banks in March 1999; and (vi) a recapitalisation of six government-owned banks and 12 regional government-owned banks during the period 1999–2000. The results of bank restructuring actions conducted during the 1997-1999 period are contained in Table 3.3 below (McLeod, 1996):

[31] IBRA then was closed on 27 February 2004 (Alijoyo et al, 2004)

[32]The intervention took the form of efforts by officials from Bank Indonesia and related agencies who assisted banks in resolving their over-borrowing of liquidity credit from Bank Indonesia (such borrowing by banks was on average more than 200 % of their own capital) and improving capital adequacy ratios of the banks to more than 5 %.

Table 3.3 Bank Restructuring During Crisis Period

	Initial	Lost		Remaining		
		Closed	Merged	Private and JV	Nationalized	State & Regional
Government-owned banks	7		3			4
Regional government-owned development banks	26					26
Non-government-owned banks	157	65	9	79	4	0
Closed in 1997	16	16				
Nationalized in 1998	4		2		2	
Closed in 1998	10	10				
Audited in March 1999						
Category A	73	1		72		
Category B						
Closed in March 1999	21	21				
Eligible for recapitalization	9			7*	2	
Nationalized	7		7			
Category C	17	17				
Joint-Venture banks	32	2		30		
Audited in March 1999						
Category A	15			15		
Category B	17	2		15		
Total	**222**	**67**	**12**	**109**	**4**	**30**

Source: McLeod (1996)

*The seven non-government-owned domestic banks nationalized in 1999 were subsequently merged with Bank Danamon, which had already been nationalized in 1998

3.5 Prudential Regulation: 2002 Onwards

Among the Asian countries that were affected by the crisis, Indonesia suffered the most significant impact, with a fiscal cost of more than 50 % of its GDP. This statistic demonstrates the devastating effect of the crisis on the Indonesian economy and its banking sector (Batunanggar, 2002). However, the performance of Indonesian banks improved substantially following the restructuring conducted after the 1997 banking crisis, as seen in Table 3.4.

Table 3.4 Performance of the Indonesian Banking Sector: 1997 - 2001 (in Trillion IDR)

	Dec-97	Dec-98	Dec-99	Dec-00	Dec-01
Total Assets	715.2	895.5	1006.71	1030.5	1099.7
Credits	378.1	487.4	225.1	269	307.6
Deposits	357.6	573.5	625.6	699.1	797.4
Equity	46.7	-98.5	-41.2	52.3	62.3
Capital Adequacy Ratio (CAR in %)	9.19	-15.7	-8.12	123.4	19.28
Non Performing Loans (Gross in %)	32.18	48.6	32.8	18.8	12.1
Return on Equity (ROE in %)	19.6	-437.23	-110.8	9.65	13.6
Loan to Deposit Ratio (LDR in %)	105.7	85	36	38.5	38.6
Number of Commercial Banks	222	208	173	164	159

Source: Batunanggar, 2002

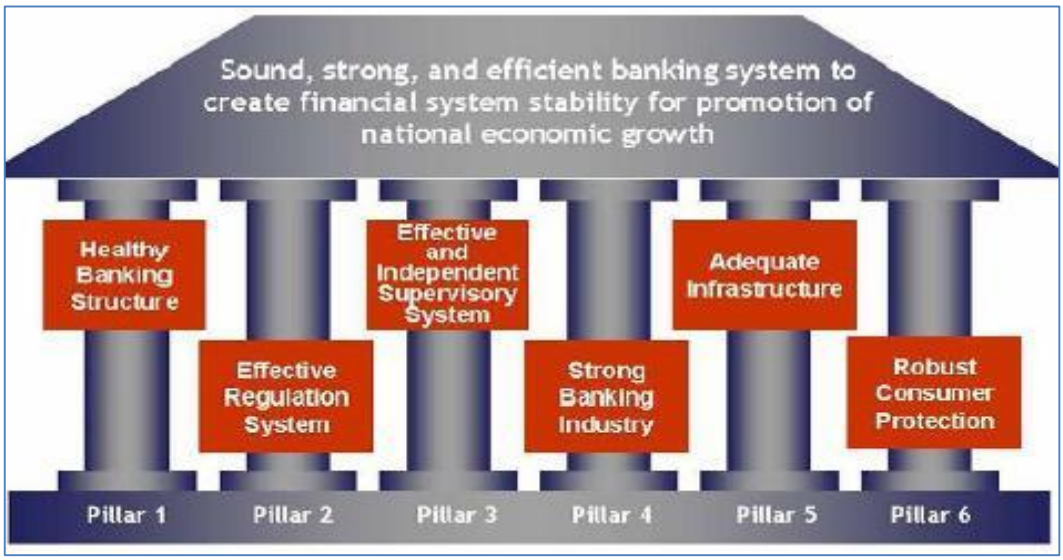
The table indicates that after the restructuring, improvements occurred in several ratios: loan to deposit ratios, capital adequacy ratios, and non-performing loan ratios. The year 1999 can be considered to be the reconciliation period, with definite improvement commencing in 2000. For example, movement in the loan to deposit ratio between 1999 and 2000 demonstrates the improvement in bank liquidity, whereas the return of capital adequacy ratio positions from negative to positive reflect a definite downward shift in bank risk. Increases also occurred in customer deposits, reflecting greater depositor confidence in the banks' loan disbursements and a decline in non-performing loans.

3.5.1 The Supervision Framework

After the Asian financial crisis, major changes were made to Indonesian banking regulations. The changes primarily focused on restructuring the banking sector and enforcing prudential standards. The Indonesian banking architecture (API) scheme, constructed by Bank Indonesia, became applicable on January 9, 2004. It was designed to reinforce the fundamentals of the banking system in response to internal and external shocks and to serve as the framework for future banking development. The API was based on a government white paper drafted under Presidential Instruction 5/2003, which expected the API to promote national economic recovery through the creation of a sound, strong, and efficient banking

sector as part of a stable financial system (www.bi.go.id). Figure 3.1 depicts the complete API framework.

Figure 3.1 Indonesian Banking Architecture (API) Scheme



Source: www.bi.go.id

The API consisted of six pillars, namely, a healthy banking structure, an effective regulatory system, an effective and independent supervisory system, a strong banking industry, adequate infrastructure, and robust consumer protection (www.bi.go.id). The scheme was implemented through 19 policies, including two to five policies per pillar.

The first pillar focused on strengthening the banking structure by increasing bank capital, empowering banks that provide rural credit and increasing access to credit. The emphasis of the second pillar was the implementation of 25 core Basel principles for effective banking supervision to ensure national financial stability. The third pillar focused on risk-based supervision and the competence of supervisors, whereas the fourth pillar addressed corporate governance and risk management issues. The fifth pillar established a credit bureau and a credit rating agency to enhance the quality of credit decisions. Finally, the last pillar focused on the establishment of structures to address customer complaints and customer education (Prastomiyono, 2008).

After the API was launched, the scheme was evaluated and redesigned to incorporate global development in banking and to improve the integration of API with national economic programmes.

3.5.2 Safety and Soundness Regulations

In Indonesia, as surveyed by Pricewaterhouse Coopers in 2012, bankers still perceived credit risk as the major risk faced by the banking sector. Bank Indonesia addressed the problem by introducing the following regulations from 2005 onwards to minimise credit risk: the imposition of loan-loss reserves (Bank Indonesia, 2005a); legal lending limits (Bank Indonesia, 2006a); capital adequacy requirements (Bank Indonesia, 2007, Bank Indonesia, 2008b); and reserve requirements (Bank Indonesia, 2010).

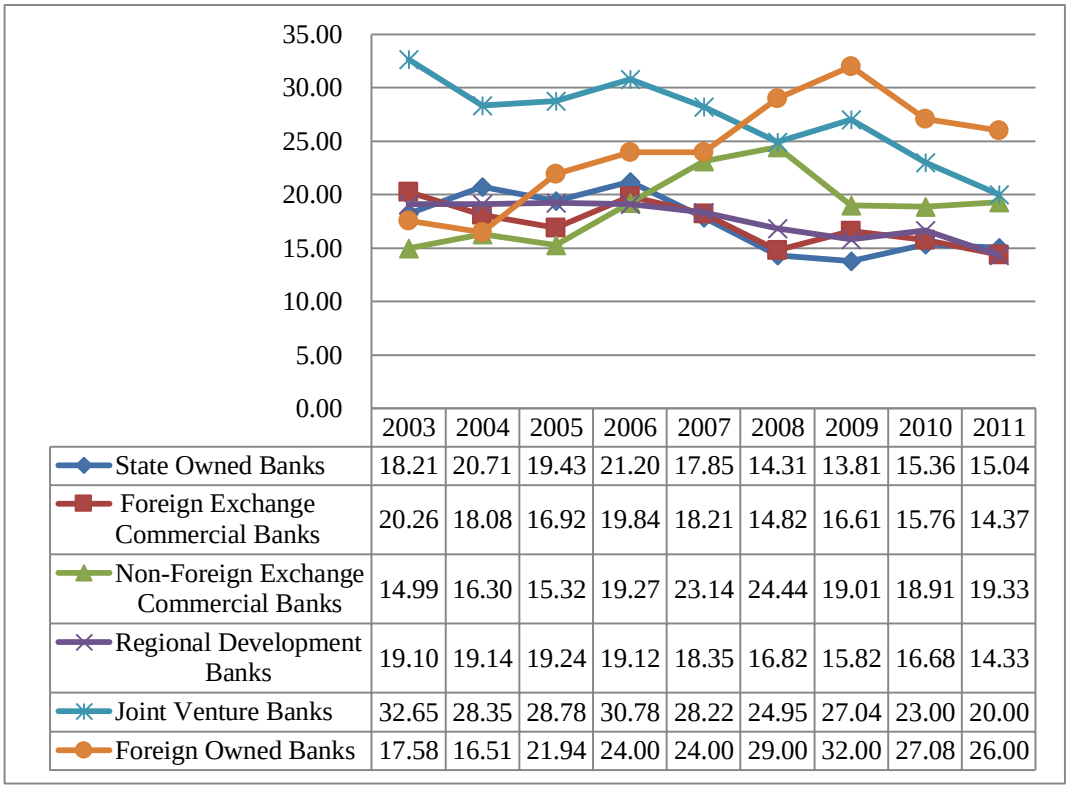
The implementation of Basel II in Indonesia was initially planned to begin in 2007 (Bank Indonesia, 2011a). However, the schedule was shifted to enable the implementation of Pillar 1 in 2011, Pillar 2 over the period 2012-2014 and Pillar 3 over the period 2011-2014 (International Monetary Fund, 2010). One of the main requirements established by the Basel Committee[33] is that proper risk management implementation must exist before the implementation of Basel II. Full implementation of Basel III is scheduled for completion by January 2019.

Figure 3.2 reflects the average capital adequacy ratios of Indonesian banks over the period 2003-2011[34]. Joint-venture banks exhibited the highest average capital adequacy over the 2003-2007 period; however, in the following years, foreign-owned banks occupied this position. Foreign-owned banks CAR ratio exceed that of joint venture banks in the 2008-2011 period since Indonesian central bank released a new regulation regarding minimum capital adequacy requirement for commercial banks which implies a stricter and higher capital requirements for foreign banks (See: Chapter 5 of Bank Indonesia Regulation No: 10/15/PBI/2008 (Bank Indonesia, 2008)). The 2011 capital adequacy of all bank types except that

[33] For additional information on Basel II implementation in Indonesia, see Implementasi Basel II di Indonesia, published by the Banking Research and Regulation Directorate under Bank Indonesia (accessible through www.bi.go.id).
[34]Since 2010, the calculation of CAR has incorporated operational risk.

of the foreign-owned banks and non-foreign exchange domestic banks decreased relative to their capital adequacy in 2003, although they remained sufficiently above the general standard of 8 %.

Figure 3.2 Capital Adequacy Ratios of Banks by Ownership Groups: 2003- 2011



	2003	2004	2005	2006	2007	2008	2009	2010	2011
State Owned Banks	18.21	20.71	19.43	21.20	17.85	14.31	13.81	15.36	15.04
Foreign Exchange Commercial Banks	20.26	18.08	16.92	19.84	18.21	14.82	16.61	15.76	14.37
Non-Foreign Exchange Commercial Banks	14.99	16.30	15.32	19.27	23.14	24.44	19.01	18.91	19.33
Regional Development Banks	19.10	19.14	19.24	19.12	18.35	16.82	15.82	16.68	14.33
Joint Venture Banks	32.65	28.35	28.78	30.78	28.22	24.95	27.04	23.00	20.00
Foreign Owned Banks	17.58	16.51	21.94	24.00	24.00	29.00	32.00	27.08	26.00

Source: Indonesian Banking Statistics, 2011

As the licencing authority under Bank Indonesia Regulation No. 11/1/PBI/2009 (Bank Indonesia, 2009a), Bank Indonesia has the right to accept or decline an application to establish a new bank. Effective in March 2011, the regulations regarding bank licencing, ownership and management have been expanded to cover changes in the Indonesian banking landscape (Bank Indonesia, 2011a).

According to Bank Indonesia Regulation No. 9/16/PBI/2007 (Bank Indonesia, 2007) of December 3, 2007, commercial banks were required to possess a minimum of 80 trillion IDR in core capital before December 31, 2007 but to increase this amount to 100 trillion IDR before December 31, 2010. For commercial banks that were unable to comply with the regulation of 100 trillion

IDR in capital, the option according to PBI No. 10/9/PBI/2008 was to become rural credit banks (Bank Indonesia, 2008a). Mergers and/or acquisitions were the other option for banks that possessed 80 trillion IDR in capital by the end of December 2010 but that were unable to achieve the 100-trillion-IDR level.

The policy essentially curbed the establishment of new banks and encouraged banks to conduct mergers, consolidations and acquisitions (Prastomiyono, 2008). As a result, there were no applications to establish new banks in Indonesia between 1999 and 2010 (International Monetary Fund, 2010). However, there were a number of ownership transfers among existing banks and transitions from conventional commercial banks into either rural credit banks or Islamic banks.

The single presence policy, Bank Indonesia Regulation No. 8/16/PBI/2006 (Bank Indonesia, 2006b), was introduced to regulate ownership (referred to as significant ownership in the policy) that exists when a single entity owns shares of a bank equal to or exceeding 25 %. The policy also stipulates that significant ownership may include a combination of entities that could be regarded as single because of close collaboration or that are otherwise connected. In the event that significant ownership of a single entity is observed in more than one bank, the significant owner may reduce its holdings in one of the banks, merge the banks or form a bank holding company. In addition, based on Bank Indonesia Regulation No. 11/15/PBI/2009(Bank Indonesia, 2009c), one of the banks could be transformed into an Islamic bank. The policy was intended to strengthen the ownership structure of the national banking industry (Prastomiyono, 2008).

3.5.3 Banking Structures in the 2000s: Consolidation Phase

The Asian financial crisis led to massive bank restructuring with the assistance of the International Monetary Fund and the World Bank. The restructuring consisted of the closure of insolvent institutions, the provision of liquidity support to commercial banks through overdraft facilities, the establishment of the IBRA, the merging and privatisation of state-owned banks, the relaxation of limitations on private ownership of banks, and the external audits of overseas auditors (Harada and Ito, 2006, Hadad et al., 2011). As a result, the number of commercial banks in

Indonesia decreased from 239 before the crisis to 164 in 1999 and continued to decrease to 120 banks by October 2011 (see Chapter 1, Figure 1.2).

Comparative figures on the number of Indonesian banks in 2003 and 2011, based on ownership classification, are presented in Table 3.5. The number of banks in 2011 (120 commercial banks[35] and 1669 rural credit banks) is less than that in 2003 (138 commercial banks and 2141 rural credit banks). However, the number of bank branches increased significantly for both commercial and rural credit banks, with the highest increase observed for non-foreign-exchange commercial banks.

Table 3.5 Number of Banks and Bank Offices in Indonesia, 2003 and 2011

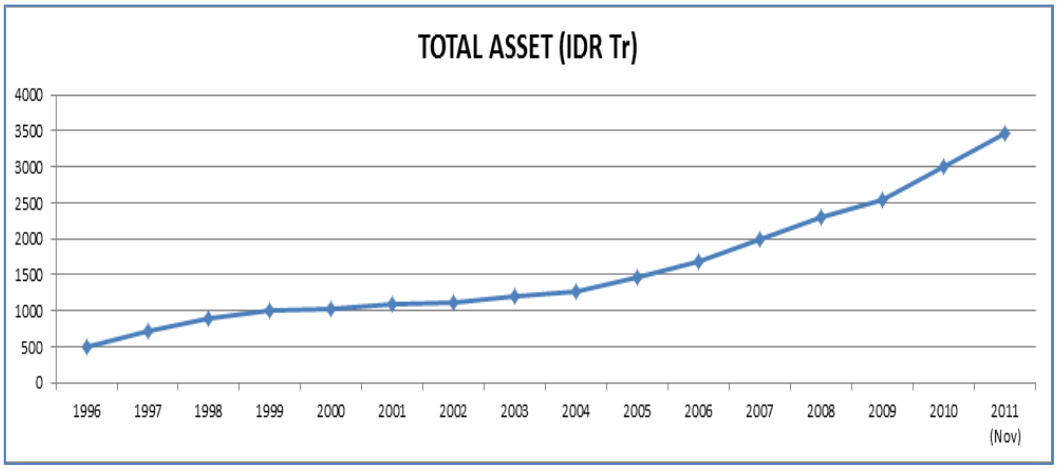
	December 2003		December 2011	
	No of Banks	No of Branches	No of Banks	No of Branches
1. Commercial Banks	**138**	**7730**	**120**	**14840**
a. State-owned Banks	5	2072	4	4363
b. Foreign Exchange Commercial Banks	36	3829	36	7254
c. Non Foreign Exchange Commercial Banks	40	700	30	1303
d. Regional Development Banks	26	1003	26	1479
e. Joint Venture Banks	20	57	14	260
f. Foreign Banks	11	69	10	181
2. **Rural Credit Banks**	**2141**	**3299**	**1669**	**4172**

Source: Indonesian Banking Statistics, 2003 and 2011

In October 2011, commercial bank assets constituted 95 % of all bank assets, which left rural credit banks with a market share of only 5 %, notwithstanding the comparatively large number of rural credit banks. Rural credit banks are microfinance institutions with a local market focus. Total commercial bank assets continued to increase (see Figure 3.3).

[35] Commercial banks in Indonesia consist of government-, domestic-, and foreign-owned banks.

Figure 3.3 Total Assets of Indonesian Commercial Banks: 1996 – November 2011 (in Trillion IDR)



Source: Indonesian Banking Statistics, Bank Indonesia

Bank Indonesia divides commercial banks into six groups based on ownership[36]: government (owned by the central government); regional (owned by provincial governments); private-foreign exchange (privately owned and allowed to conduct foreign exchange transactions); private non-foreign exchange (privately owned and not allowed to conduct foreign exchange transactions); joint venture (privately owned by foreign banks and domestic investors); and foreign (subsidiaries of foreign banks). These banks are allowed to open branch offices in any vicinity in the country under Banking Act No. 7/1992. The number of banks categorised according to ownership groups is as follows:

Table 3.6 Number of Banks According to Bank Indonesia Ownership Group Classification over the period 2003-2011

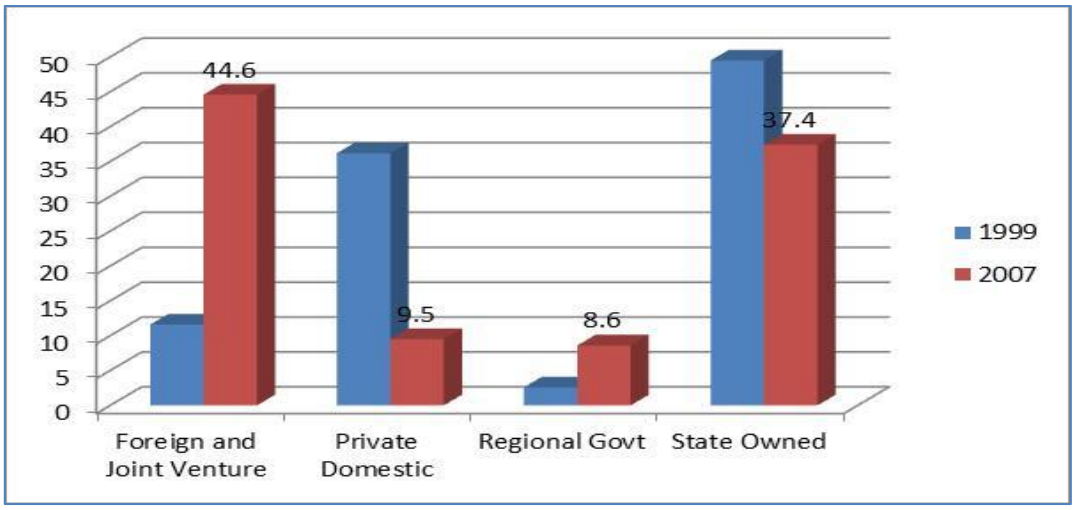
Bank Ownership Group	2003	2004	2005	2006	2007	2008	2009	2010	2011
State-owned Banks	5	5	5	5	5	5	4	4	4
Foreign Exchange Commercial Banks	36	35	34	35	35	35	34	36	36
Non-Foreign Exchange Commercial Banks	40	38	37	36	36	33	31	31	30
Regional Development Banks	26	26	26	26	26	26	26	26	26
Joint Venture Banks	20	19	18	17	17	15	16	15	14
Foreign Owned Banks	11	11	11	11	11	10	10	10	10
All Banks	138	134	131	130	130	124	121	122	120

Source: Indonesian Banking Statistics, Bank Indonesia

[36]The origin of the classification is BL 14/1967 with further adjustment.

The market share of foreign-owned banks[37] increased, particularly after the abolition of foreign bank branch limitations and the relaxation of foreign ownership limits in 1999 through government regulation No. 29/1999 (Republik Indonesia, 1999a). This legislation was followed by the termination of the restrictions on the number of foreign-owned bank branches in Indonesia by the Decree of Bank Indonesia Director No. 32/37/KEP/DIR/1999[38] (Hadad et al., 2004), and Bank Indonesia regulation No. 2/27/PBI/2000 (Bank Indonesia, 2000) abolishing the restrictions that prevented foreign-owned banks from financing export loans. The relaxation of limitations enabled foreign investors to obtain ownership in Indonesian banks of up to 99 %, either through the capital market or mergers and acquisitions. The formerly non-government-owned domestic banks, which were to be nationalised by the government under the Indonesian Bank Restructuring Agency, had their ownership transferred to foreigners because many domestic Indonesian banks were not financially able to participate in the recapitalisation programme. As such, the ownership share of foreign investors in the Indonesian banking sector increased, as can be observed in Figures 3.4 and 3.5 below.

Figure 3.4 Total Assets by Bank Ownership Types: 1999 and 2007



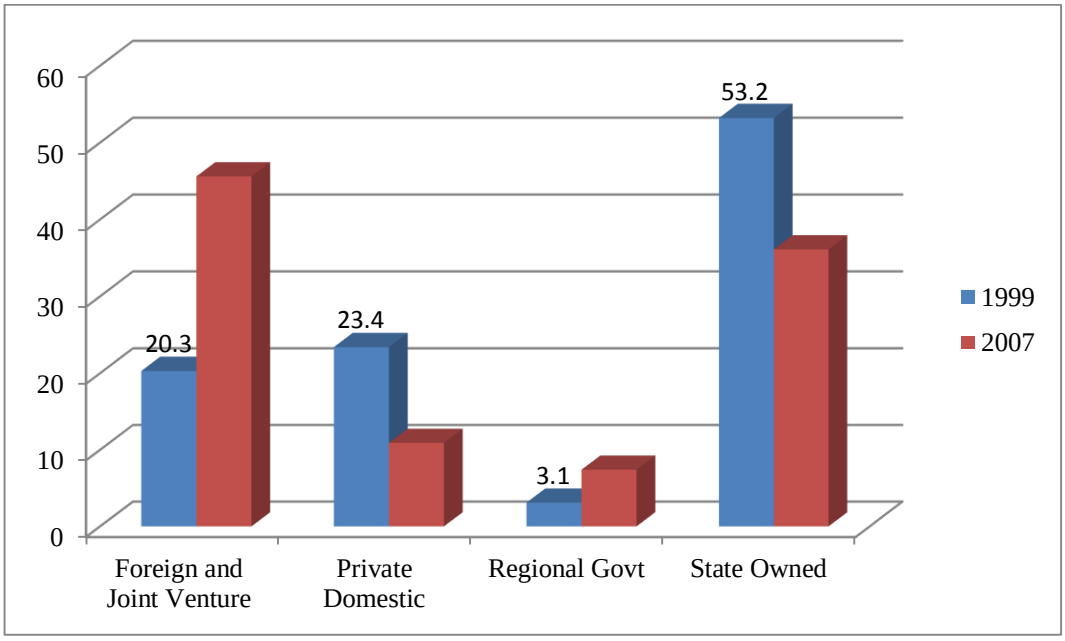
Source: Prastomiyono, 2008

[37]Consists of foreign-owned bank subsidiaries, joint-venture banks and foreign bank branches.

[38] The Bank Indonesia regulation issued in the following year (2/27/PBI/2000) provides a level playing field for all types of banks. Since then, the regulation restricting foreign-owned banks to financing export loans also has been abolished.

The figure indicates that during the period 1999-2007, the total assets of foreign-owned banks and joint-venture banks increased significantly. Regional development banks exhibited a similar trend, although their asset growth was far less than that of the former group. Conversely, non-government-owned domestic banks and government-owned banks experienced a decline in total assets, with the most significant decrease observed for non-government-owned domestic banks. This result reflects the transfer of market share from domestic and government-owned banks to foreign-owned and joint-venture banks. Therefore, the role of foreign and joint-venture banks in the Indonesian banking industry became increasingly prominent. Loan disbursements, measured by total loans in Figure 3.5, provide similar information.

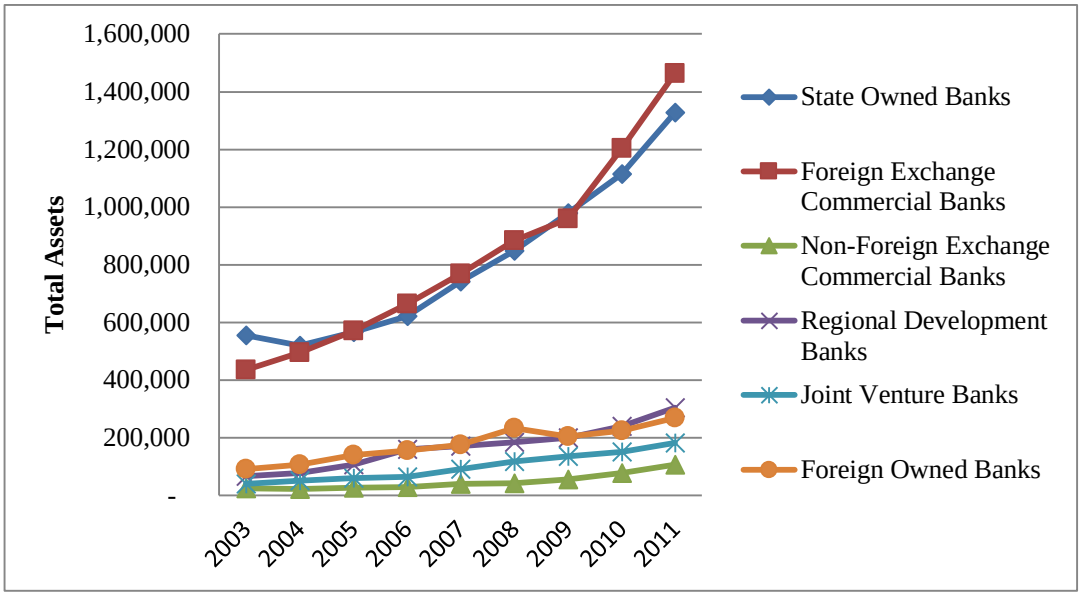
Figure 3.5 Total Loans Provided by Indonesian Banks: 1999 and 2007



Source: Prastomiyono, 2008

Although few state-owned banks existed, these banks held the largest market share until 2009. From 2010 onwards, foreign-exchange commercial banks attained the largest market share. The different types of banks did not experience similar growth or increases in asset size over the 2003 to 2011 period (refer to Figure 3.6).

Figure 3.6 Total Assets of Commercial Banks Based on Bank Indonesia Ownership Group Classification: 2003-2011(in Trillion IDR)



Source: Banking Statistics of Bank Indonesia (2003-2011)

According to Table 3.7, the state-owned banks were on average the largest banks in 2003 and maintained this position in 2011. Non-foreign-exchange commercial banks and regional development banks were the groups with the largest number of small banks (smaller than 1 trillion IDR in total assets). The sizes of all commercial bank sub-groups increased substantially over the period 2003-2011, except for non-foreign-exchange banks, which experienced the least growth in total assets, with no banks having assets in excess of 50 trillion IDR in 2011.

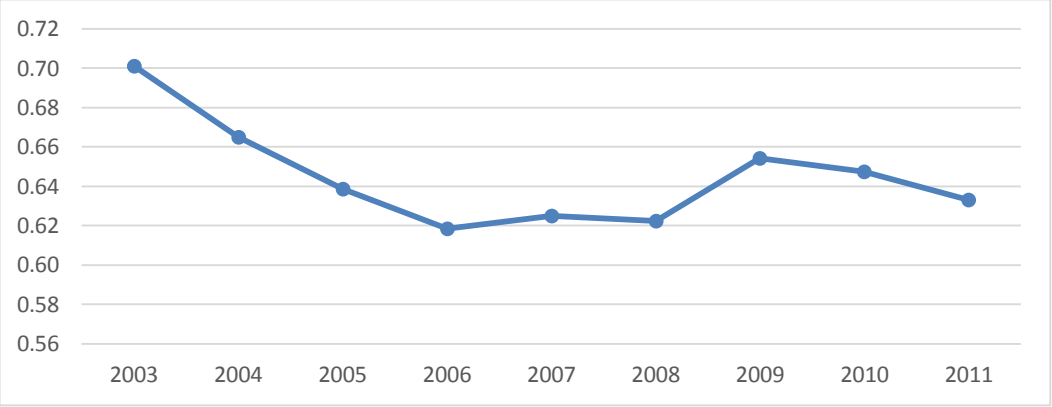
Table 3.7 Indonesian Bank Ownership Types: Asset Size Based on Central Bank Ownership Classification in 2003 and 2011

Bank Ownership Group	December 2003					December 2011				
	< 1 Trillion IDR	1-10 Trillion IDR	10-50 Trillion IDR	>50 Trillion IDR	Total	< 1 Trillion IDR	1-10 Trillion IDR	10-50 Trillion IDR	>50 Trillion IDR	Total
State-owned Banks	0	1	1	3	5	0	0	0	4	4
Foreign Exchange Commercial Banks	8	17	9	2	36	1	18	7	10	36
Non-Foreign Exchange Commercial Banks	31	9	0	0	40	12	15	3	0	30
Regional Development Banks	10	15	1	0	26	0	14	11	1	26
Joint Venture Banks	7	13	0	0	20	0	6	8	0	14
Foreign Owned Banks	3	3	5	0	11	0	4	3	3	10
Total	59	58	16	5	138	13	57	32	18	120
% of Total	0.43	0.42	0.12	0.04	1	0.11	0.48	0.27	0.15	1

Source: Banking Statistics of Bank Indonesia (2003 and 2011)

A further analysis of the total assets of banks indicates that the combined assets of the ten largest banks represented 70 % of all bank assets in 2003 (see Figure 3.7) but decreased to 63 % in 2011. This figure indicates an overall increase in competition.

Figure 3.7 Ten Largest Commercial Banks: Total Asset Market Share for the Period of 2003- 2011



Source: Banking Statistics of Bank Indonesia (2003-2011)

In terms of asset size, all four government-owned banks (Bank Mandiri, Bank Negara Indonesia (BNI), Bank Rakyat Indonesia (BRI) and Bank Tabungan Negara (BTN)) were amongst the top ten banks in both 2003 and 2011 (Table 3.8). However, their relative asset size differences declined.

Table 3.8 Ten Largest Indonesian Commercial Bank Assets, 2003 and 2011

Rating	December 2003			December 2011		
	Bank Name	Assets		Bank Name	Assets	
		(In Million IDR)	(In %)		(In Million IDR)	(In %)
1	Bank Mandiri (Persero) Tbk*	293,205	24	Bank Mandiri (Persero) Tbk*	493,050	13.5
2	Bank Central Asia Tbk	132,797	11	Bank Rakyat Indonesia (Persero) Tbk*	456,383	12.49
3	Bank Negara Indonesia (Persero) Tbk *	131,890	11	Bank Central Asia Tbk	380,927	10.43
4	Bank Rakyat Indonesia (Persero) Tbk*	99,216	8	Bank Negara Indonesia (Persero) Tbk *	289,458	7.92
5	Bank Danamon Indonesia Tbk	52,752	4	Bank CIMB Niaga Tbk	164,247	4.50
6	Bank Internasional Indonesia	34,600	3	Bank Danamon Indonesia Tbk	127,128	3.48
7	Bank Permata Tbk	29,082	2	Pan Indonesia Tbk	118,991	3.26
8	Bank Tabungan Negara (Persero) Tbk*	26,866	2	Bank Permata Tbk	101,540	2.78
9	Lippo Bank Tbk	26,418	2	Bank Internasional Indonesia Tbk	91,335	2.50
10	Citibank NA	23,746	2	Bank Tabungan Negara (Persero) Tbk*	89,277	2.44
Sub Total	State-owned Banks	551,177	45	State-owned Banks	1,264,975	36.35
Total		850,572	70		2,312,336	63.30

*: state-owned banks

Source: Banking Statistics of Bank Indonesia (2003 and 2011)

The dominant position of government-owned banks resulted from past interest rate subsidies received from the government and target markets identified by the government for each of the state-owned banks (Adiningsih, 1996). These banks were given special treatment relative to other banks because of their role as government development agents in identified economic areas. Nonetheless, their share of the banking industry decreased relative to other banks because of the 1983 deregulation policy and Bank Act No. 7/1992, which created a level playing field for both government-owned and non-government-owned banks. Prior to deregulation (August 1965), their assets comprised 90 % of total bank assets in Indonesia. Subsequently, the massive restructuring of the Indonesian banking industry led to a decline in the market share of government-owned banks and an increase in the market share of other bank types. As such, the market share of the remaining government-owned banks decreased to 36.4 % in December 2011 (Table 3.8).

3.5.4 Loan Portfolio Regulations

In addition to capital requirements and deposit insurance, Bank Indonesia also imposes limitations/restrictions on bank lending exposures to single borrowers, borrower groups and related parties. The latest regulation (PBI No. 8/13/PBI/2006) establishes 20% of bank capital as a maximum threshold for exposure to non-related single borrowers, a threshold of 25% for non-related group borrowers and one of 10% for related party borrowers (Bank Indonesia, 2006a).

Despite the quantitative restrictions on bank lending in the form of legal lending limits, Bank Indonesia regulates loan-loss provision through PBI No. 7/2/PBI/2005 (Bank Indonesia, 2005a). The general provision is established at one % of the current liquid assets, and the special provision varies according to loan collectability: five % for the special mention category, 15 % for the sub-standard category, 50 % for the doubtful category and 100 % for the loss category. The calculation must be performed by first deducting the realisable collateral value

from the asset under provision in any of the aforementioned categories of collectability.

An evaluation conducted by the International Monetary Fund in 2009 found that despite the sufficiency of Bank Indonesia's regulations and bank compliance with respect to credit risk management, gaps existed concerning aspects such as large exposures, related party exposures, asset classification and provisioning requirements, and country risk. Further, several problems related to non-performing loans persisted. The report suggested the need for Bank Indonesia to review and revise its regulations (International Monetary Fund, 2010).

3.6 Summary

The Indonesian banking industry has undergone a series of deregulation and reregulation processes since 1967. Beginning with the enactment of Banking Act No. 14/1967, deregulation continued, with the most significant changes occurring during the 1980s. The deregulation programme was intended to reduce the role of government-owned banks by levelling the playing field for all banks. In this regard, regulations concerning direct government control over lending practices (interest rate ceilings and the allocation of loans) were relaxed.

The liberalisation of the Indonesian banking industry increased the number of banks (both private-owned domestic and foreign-owned) and reduced the dominance of government-owned banks in the banking industry. However, banks' low capital levels and risky lending practices, coupled with a lack of effective supervision from Bank Indonesia, forced reregulation. As such, the new banking law of 1992 was an effort to reduce bank expansion and improve the prudential operation of banks. However, the problems that existed in the banking sector at that stage could not be resolved. This situation left Indonesia vulnerable to severe implications from the Asian financial crisis in the late 1990s.

The government implemented an intensive restructuring programme following the Asian financial crisis. The de-liberalisation of the banking sector after the crisis took the form of bank consolidation and numerous prudential policies, followed

by a new banking architecture scheme designed to reinforce the fundamentals of the banking system in response to internal and external shocks and to serve as the framework for future banking development.

The increasing role of foreign and private-domestic banks in the Indonesian banking industry in the post-crisis era from 2003 to 2011, in conjunction with the prudential regulations introduced by Bank Indonesia regarding lending practices, may have influenced the loan portfolio compositions of different bank types. Therefore, it is important to explore whether differences exist and whether bank performance changed. The next chapter will discuss the methods to be employed in addressing the research questions posed in the first chapter.

Chapter 4

RESEARCH METHODOLOGY

4.1 Introduction

The previous chapter provided an overview of the Indonesian banking industry with a focus on regulatory implementation phases pertaining to banking industry structures and loan portfolios. This chapter describes the research methodology employed in this study. First, an overview of the research framework, sample selection and data collection is provided. Thereafter, details are provided on the methodology applied to determine loan changes and differences in portfolio composition and concentration, loan repayment default risk and performance for different bank ownership types in Indonesia during the period 2003-2011. The methodology employed to determine the combined impact of bank ownership types, loan portfolio concentration and loan repayment default risk on the performance of banks is also provided.

4.2 Research Framework

The framework for this research is derived from the research objective to determine:

- the changes and differences in the loan portfolio composition and in the concentration of Indonesian commercial banks with respect to ownership type and differences and changes in loan portfolio risk and returns; and

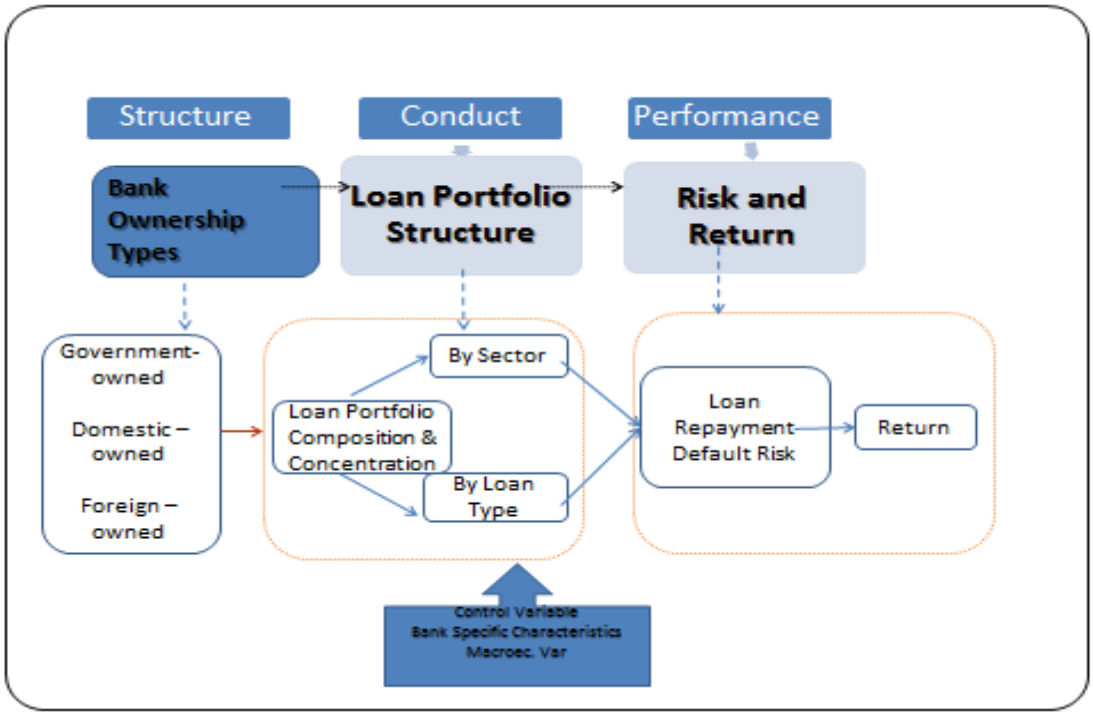
- the impact of the different bank ownership types, loan portfolio concentration and risk on the return of such portfolios over the period 2003-2011.

As indicated in Chapter 2, Section 2.4, researchers such as De-Haas et al. (2010) indicate that banks with different ownership types may focus on different borrowers; thus, the portfolio structures (composition and concentration) of banks with different ownership types may differ. These differences in loan portfolio composition and concentration may imply different levels of loan repayment default risk. As such, differences in loan repayment default risk, combined with differences in loan

portfolio composition and concentration for the various bank ownership types, may result in different loan portfolio returns. The assumed relationship among the aforementioned variables may, however, be substantially implicated by other aspects such as bank size, bank liquidity and bank equity levels and the prevailing macro-economic environment (refer to Chapter 2, Section 2.3.2.1). Therefore, these aspects are used as control variables to exclude the effect of differences across banks in terms of these aspects and the effect of the macro-economic environment in the model (refer to Berger et al. (2005) and Tabak et al. (2011a)).

The conceptual framework for the research is depicted in Figure 4.1 below.

Figure 4.1 Conceptual Framework



4.3 Research Period, Sample Selection and Data Collection

The following sections provide details on the research period, the research sample and the data collection process.

4.3.1 Period of Analysis

This research focuses on the period from 2003 to 2011. This period encompasses the post-Asian financial crisis period from 2003 to the commencement of the global financial crisis (GFC) in 2007 and the post-GFC situation from 2007 onwards.

The selection of 2003 as the starting point provides all banks included in this research with a five-year recovery period after the 1997 Asian financial crisis. The massive restructuring of the Indonesian banking industry following the Asian financial crisis not only reduced the number of banks but also changed the composition of bank ownership structures (see Chapter 1, Section 1.1). The selection of a five-year lag is supported by the average loan to deposit ratios (LDR), capital adequacy ratios (CAR) and return on assets (ROA) of Indonesian banks (see Chapter 1, Figure 1.1) because this lag provides evidence of stability commencing in 2001. In addition, the year 2003 is chosen as the start year since it represents the commencement of the post Asian Financial Crisis period marked by the commencement of the banking industry recovery and the implementation of comprehensive bank regulatory requirement changes that were designed to reinforce the fundamentals of the banking system in response to internal and external shocks and to serve as the framework for future banking development. These regulatory requirement changes relate to corporate governance (PBI 5/8/PBI/2003), risk management implementation (PBI 5/8/PBI/2003) and changes to Bank Indonesia liquidity credit management (5/20/PBI/2003). This was followed by the Indonesian banking architecture (API) scheme, constructed by Bank Indonesia, which became applicable in 2004.

According to Dell Ariccia et al. (2012), it is evident that banks relaxed their lending standards during this pre-GFC period. This tendency increased the risk of loan portfolios as measured by non-performing loans (NPLs). Therefore, the year 2007 is treated as the final year of the pre-GFC period because the GFC began in the latter half of this year and only then triggered preventive and/or resolving actions on the part of banks (Brunnermeier, 2009, Balakrishnan, 2009, Claessens, 2010, Gambacorta and Marques-Ibanez, 2011). Using this year as the cut-off point between the pre- and post-GFC periods is important because the serious financial distress that

the GFC generated for economies and banks has been clearly established (Gambacorta and Marques-Ibanez (2011)).

The year 2008 is commonly regarded as the year in which the crisis began and spread to other countries beyond the advanced economies (Claessens, 2010). Therefore, the consequences of preventive and/or resolving actions taken by banks based on GFC implications, which had already occurred or were anticipated because of their awareness of the crisis, are reflected from 2008 onwards.

The year 2007 is selected to represent the end of the pre-GFC period since preliminary data analysis about bank restructuring, insolvencies, loan risks and profit generation of banks in the sample did not show any evidence of GFC impact at this stage. The year 2011 represents the final year of the post-GFC period in this study since it was the latest complete bank data that could be retrieved when the study was conducted. Furthermore, a different reporting format on sectoral loan allocation and NPLs became applicable in January 2012 (PBI 10/40/PBI/2008). These changes would impact the comparison of findings from 2012 onwards compared with previous years due to the dissimilarity of the data.

Examining the key years of 2003, 2007 and 2011 enables specific comparisons of the extent of differences and changes over the periods 2003 to 2007 (post-Asian crisis and pre-GFC period) and 2007 to 2011 (GFC and post-GFC period), and the overall 2003 to 2011 period.

4.3.2 Selection of Banks

All non-Islamic Indonesian commercial banks constitute the population of the study. Islamic commercial banks are excluded because they are not considered to be comparable to conventional banks in terms of loan portfolios and risk and return measures based on the underlying religious principles forming the basis of their operations. According to Karim (2001) and Faturohman (2013), no interest charges apply in Islamic commercial banks. Islamic banks earn income through profit and loss sharing, trading, leasing, charging fees for services rendered, and using other sharia-based contracts of exchange (Jamaldeen, 2012).

All non-Islamic commercial banks that existed over the full research period are included. All banks that only existed for a portion of the research period (new banks that began to operate after 2003 and banks that discontinued operations before 2011) are excluded. From 2003 to 2011, only 8 banks discontinued their operations. For banks involved in mergers or acquisitions between 2003 and 2011, the financial statements of the individual banks are considered prior to the time of the merger or acquisition, and thereafter, the merged financial statements are used for both banks. Research data (such as total loan and total assets data) on banks that merge at any stage during the 2003 to 2011 period are also combined in the pre-merger year/s, analogous to the case of mergers. The weighted average approach, based on pre-merger proportions retrieved from the separate financial reports of the banks, is used to calculate relevant combined ratios (such as the non-performing loan ratios) of the banks in such pre-merger years. This treatment is similar to that applied by Hayden et al. (2006) and Micco et al. (2007). Eleven banks merged between 2003 and 2011 (see Table 4.3).

As a result, the number of banks selected is 109, yielding a total number of observations of 981 (109 banks over 9 years). The value of the assets of the banks in the sample constitutes approximately 89% of total Indonesian banking assets (Islamic and non-Islamic) in 2003 and 97% in 2011. Regarding the number of banks, the sample represents 78.9% of all Indonesian banks in 2003 and 90.8% in 2011. The sample is therefore representative of Indonesian banking.

Table 4.1 summarises how the sample is derived for this research. Appendix A contains a list of the sample banks.

Table 4.1 Sample-Selection Procedures

Description	Number of Banks	
	2003	2011
Number of Commercial Banks in Indonesia	138	120
Less Banks liquidated	(8)	-
Less Banks that merged or were acquired by other banks	(11)	-
Less Islamic banks	(10)	(11)*
Number of Banks in Final Sample	**109**	**109**

*: One new Islamic bank established in 2010

Details concerning the eight liquidated banks excluded from the research are provided in Table 4.2 below.

Table 4.2 List of Banks Liquidated during the 2003-2011 Research Period

Date liquidated	Number of banks	Bank(s) Name
8 April 2004	2	Bank Dagang Bali
		Bank Asiatic
13 May 2005	1	Global International Bank
5 October 2006	1	Bank UFJ Indonesia
1 September 2009	1	Bank Ekspor Indonesia
17 April 2009	1	Bank IFI
24 February 2009	1	American Express Bank
2011	1	Barclay Bank
TOTAL	**8**	

*: Self-liquidated by Mitsubishi Tokyo Financial Group

Table 4.3 lists the banks that merged or were acquired by other banks during the 2003-2011 research period.

Table 4.3 List of Banks Merged or Acquired by Other Banks During the 2003-2011 Research Period

YEAR	NAME OF BANKS				
	Before Merger and Acquisitions			**After merger and/or Acquisitions**	**Number of Affected Banks**
2004	Danpac	CIC	Pikko	CIC (Century-Mutiara)	2
2005	Artha Graha	Inter Pacific		Artha Graha International	1
2007	Windu Kentjana	Multicor		Windu Kentjana International	1
	Artha Niaga Kencana	Commonwealth		Commonwealth	1
2008	Harmoni	Index Selindo		Index Selindo	1
2008	Haga	Hagakita	Rabobank Duta	Rabobank International Indonesia	2
	Lippobank	Niaga		CIMB Niaga	1
2010	UOB Indonesia	UOB Buana		UOB Indonesia	1
2011	OCBC Indonesia	NISP		OCBC NISP	1
	Total				**11**

Source: Primary data based on information from Infobank Research and Development

The list of the eleven Islamic banks excluded from the sample because of their differences from conventional, non-Islamic banks is provided in the table below.

Table 4.4 List of Islamic Banks in Indonesia Excluded from the Sample

No	BANK NAME	BANK INDONESIA OWNERSHIP CLASSIFICATION
1	Mega Syariah	Foreign- exchange Private bank
2	Mandiri Syariah	Foreign- exchange Private bank
3	Bank Muamalat	Foreign- exchange Private bank
4	BNI Syariah*	Non-foreign exchange private bank
5	BCA Syariah	Non-foreign exchange private bank
6	BUKOPIN Syariah	Non-foreign exchange private bank
7	Jabar Banten Syariah	Non-foreign exchange private bank
8	Panin Syariah	Non-foreign exchange private bank
9	Victoria Syariah	Non-foreign exchange private bank
10	BRI Syariah	Non-foreign exchange private bank
11	Maybank Syariah	Joint- venture bank

*Newly established in 2010

4.3.3 Data Collection Process

This research uses secondary data from the Bank Indonesia library, Infobank Magazine and the library of The Indonesian Banking Development Institute (LPPI); data were not available from a single database provider such as Bankscope or ORBIS. Bank Indonesia provides individual bank ownership data and financial statements (balance sheets and income statements) for the 2003 to 2011 calendar years, whereas the Infobank Magazine[39] provides information that permits the retrieval of loan type and loan portfolio composition with respect to economic sector and interest income from loans. However, Infobank Magazine does not provide all information for certain banks. In such instances, the information is obtained from LPPI and individual bank websites.

However, 14 observations concerning the loan portfolio compositions of 11 banks in the sample cannot be retrieved - primarily for 2003 but also for 2004 and 2005 (see Table 4.5). To retain the banks in the sample, the missing data were simulated in three alternative ways. In instances in which the missing data came from 2003 (the

[39] Bank Indonesia does not provide additional information because of its confidentiality policy. However, according to PBI 3/22/PBI/2001, there are other institutions such as Infobank and LPPI to which individual banks submit their annual reports, thus eliminating the need to obtain annual reports individually from banks.

first year considered), the loan proportion allocated to each economic sector (type) for a bank in 2004 was multiplied by the total loans of the corresponding bank in 2003 to provide a 2003 loan portfolio composition similar to that in 2004. When the data were missing for either 2004 or 2005 (see Table 4.5), the average loan portfolio compositions in one preceding year and one subsequent year were used to calculate the loan portfolio composition for the year for which the data were missing. For one bank with three consecutive missing years (from 2003 to 2005), the loan portfolio composition for all missing years was assumed to be identical to the composition in the first available year (2006). Therefore, the loan proportion allocated to each economic sector (type) for the bank in 2006 was multiplied by the total loans of the corresponding bank in 2003, 2004 and 2005 to provide a loan portfolio composition similar to that in 2006. The actual total loan data of the individual banks (obtained from the Indonesian Banking Directory of Bank Indonesia) were used as criteria in the calculations.

The likely consequences of these adjustments are the underestimation (overestimation) of loan portfolio allocation when the base year(s) data is lower (higher) than the actual year data. This discrepancy will be very minor since the number of observations implicated by this adjustment represents 14 of 981, thus 1.43%.

Table 4.5 Lists of Banks with Missing Loan Allocation Data

No	Bank	Year
1	PT BPD KALBAR	2003
2	BPD KALIMANTAN TIMUR	2004
3	PT BPD LAMPUNG	2005
4	BPD SULAWESI TENGGARA	2003
5	PT BANK ANTAR DAERAH	2003, 2004, 2005
6	PT BANK ARTHA GRAHA INTERNASIONAL	2003
7	PT BANK MASPION INDONESIA	2003
8	PT BANK INA PERDANA	2003, 2004
9	PT BANK PUNDI INDONESIA, Tbk	2004
10	CITIBANK NA	2003
11	THE HONGKONG & SHANGHAI BC	2003

The compilation of individual bank loan portfolio data from the annual report information requires discretionary adjustments. In certain cases, the banks list the types of loans they provide without classifying them in accordance with the Bank Indonesia classification. Therefore, the researcher must perform a discretionary classification to convert the loans of such banks into Bank Indonesia classification as stated in Bank Indonesia circular letter No. 14/5/DSM[40] (Bank Indonesia, 2009d). Table 4.6 contains examples of such loan re-classifications.

Table 4.6 Examples of Judgemental Loan Re-Classifications

BANK	YEAR	Type of Loan	Re-Classification based on Bank Indonesia Category	Justification
PT ANZ PANIN	2004	Credit Cards	Consumption	Notwithstanding the fact that credit cards are also used for business purposes, it is assumed that the majority of credit cards are for consumption purposes
PT Bank Harda International	2004	Banker Acceptances	Working Capital	Banker Acceptances are commonly applied as a short term form of funding
PT. Bank Ina Perdana	2006-2008	Employee loans	Consumption	Employee loans are used for private purposes by employees of banks like inter alia the purchase of residential properties, motor vehicles and for other consumption purposes

The final issue relates to the use of data from either consolidated or unconsolidated bank financial statements. For example, in 2003, nine banks (8.25% of the 109 banks) provided both consolidated and unconsolidated financial reports. Bank Indonesia Regulation (PBI) No. 7/50/PBI/2005 requires banks with subsidiaries to submit financial reporting in both consolidated and unconsolidated formats (Bank Indonesia, 2005b). Data from the unconsolidated financial statements are used in all cases because they represent direct and accurate information applicable to the individual banks included in the research sample.

[40] According to Bank Indonesia circular letter (14/5/DSM), there are three types of loans, based on the intended loan use: working capital loans (short-term loans to finance customer working capital requirements), investment loans (medium- or long-term loans to purchase capital goods and services related to rehabilitation, modernisation, expansion, and project relocation and for establishing start-up businesses), and consumption loans (loans for consumption purposes, by way of purchasing, renting/hiring or other means)

4.4. Main Variable Definitions and Measurement

Three main independent variables are applied in this research: bank ownership types, loan portfolio concentration and loan repayment default risk. A number of macroeconomic and bank-specific control variables are used in conjunction with the main independent variables. The macroeconomic variables are the Indonesian prevailing interest rate and GDP. The bank-specific control variables are the sizes of banks, bank equity ratios, and bank liquidity ratios. The dependent variable in this research is the loan portfolio return of banks. The control variables will be discussed in Section 4.5.

4.4.1 Determining and Quantifying Bank Ownership Types

For the purposes of analysis, banks are categorised into three ownership types (government-owned, foreign-owned, and domestic-owned) according to the criteria of Mian (2003), Magalhaes et al. (2010) and Claessens and Horen (2012). This categorisation is achieved by first calculating the government-, foreign- and domestic- ownership percentage of each bank[41]. This study then uses a 50% threshold, in line with the accounting principle that regards a share of 50% or more as dominant ownership (Kieso et al., 2010). It is also consistent with prior research conducted by La-Porta et al. (2002), Dinc (2005), Haw et al. (2010) and Taboada (2011). This research employs two dummy variables to identify the three bank ownership types. Domestic-owned banks are treated as the base case because they represent the largest number of banks; therefore, a dummy variable does not exist for these banks. Table 4.7 reports the details of the dummy variables used for government-owned and foreign-owned banks.

Table 4.7 Dummy Variables Used for Government-owned and Foreign-owned Banks

Dummy Variables	Bank Ownership Types
D1:GB	1=Government-owned Banks; 0=Others
D2:FB	1=Foreign-owned Banks; 0=Others

[41] For certain banks, total ownership exceeds 100%; hence, the approach in these cases is to assume that the maximum ownership is 100%.

4.4.2 Measuring and Quantifying Loan Portfolio Structures: Composition and Concentration

a. Loan Portfolio Composition

Two types of loan portfolio composition are considered in this research. The first is composition with respect to sectors based on the classification stated in Bank Indonesia circular letter No. 14/5/DSM (Bank Indonesia, 2009d). The sectors are based on the Indonesian Standard Industrial Classification of 2005, as follows: agriculture; hunting and agricultural facilities; mining; manufacturing; electricity, gas and water; construction; trade, restaurants and hotels; transportation, warehousing and communications; business services; social services; and others.

The second type of loan composition is based on loan types as also reflected in Bank Indonesia circular letter (14/5/DSM), namely, working capital loans, investment loans and consumption loans (Bank Indonesia, 2009d).

The loan portfolio composition for individual banks is measured by the portion of loans allocated to each sector/type of loan relative to total loans.

$$p_{i,t} = \left[\frac{X\ i,t}{TL\ i,t}\right] \quad \text{.....(1)}$$

Where:

$p_{i,t}$ = the percentage of loans to sector *i* (loan type *i*) in year t

$X_{i,t}$ = the loan allocation to sector *i* (loan type *i*) in year t

$TL_{i,t}$ = the total loans of bank *i* in year *t*

Because composition is measured as a proportion, the values are between 0 and 100. Other researchers, such as De-Haas et al. (2010), overcome the potential problem of having the proportion bounded between 0 and 100 by using log-transformed proportions of lending to specific sectors/loan types. This procedure is a common, mathematically convenient approach for considering data when the values vary between 0 and 1. In this research, the log-transformed result is compared to the non-log-transformed result. If the same conclusion holds, the non-log-transformed data are applied in further analysis.

b. Loan Portfolio Concentration

Loan portfolio concentration is measured using the Herfindahl-Hirschman Index (HHI), similarly to the approach followed by other researchers such as Winton (1999), Acharya et al. (2002), Hayden et al. (2006), and Tabak et al. (2011a). The formula is as follows:

$$HHI = \sum_{i=1}^{N} \left(\frac{p_i}{Q}\right)^2 ; \text{Q}= \sum_{i=1}^{10} p_i \quad \text{.....(2)}$$

Where:

HHI = Herfindahl-Hirschman Index

pi = the percentage of loans to sector $(\text{type})_i$

N = 10 for E-HHI and 3 for THHI

The HHI, a model-free method, can be used to measure both firm-specific risk (idiosyncratic risk) and sectoral concentration. It assumes an equally distributed benchmark; see, e.g., Pfingsten and Rudolph (2002) and Kamp et al. (2005). Loan concentration denotes high exposure to one or a few sectors (Tabak et al., 2011a), and therefore the HHIs of banks serve as indicators of their comparative loan portfolio distribution.

The limitation of the HHI lies in its inability to incorporate loan default probability as a proxy for loan quality. The index also ignores the interdependency of credit risk between sectors when used to measure sectoral concentration (Deutsche Bundesbank, 2006). However, it is the most widely used formula because of its simplicity. Based on the formula, the HHI is essentially a measure of portfolio composition with respect to focus or diversification. In this research, there will be two types of HHIs, namely economic sector HHI (E-HHI) and loan type HHI (T-HHI). The boundaries of the HHI are given by: $1/n \leq HHI \leq 1$, where *n* denotes the number of segments (sectors or loan types). The higher the calculated HHI figure for a bank, the more concentrated is the loan portfolio of such a bank.

Research using EHHI (sectoral/industrial loan portfolio concentration) have been conducted by Winton (1999), Acharya et al. (2002), and Hayden et al. (2006) in

accordance with sectoral loan allocations published by the banks. The Indonesian sectoral classification used in this study is based on Bank Indonesia circular letter No. 2/21/PBI/2000 that is aligned with the Standard Industrial Classification used by the Indonesian Statistical Bureau and can be regarded globally generalised.

THHI is an extra measure of loan portfolio concentration which was not used in previous literature. It is used in this research to explore whether it may contribute in addition to the EHHI sectoral classification applied by other researchers. In essence it distinguishes between investment, working capital, and consumption loan application in Indonesia, and therefore combines sector allocation with loan purposes.

4.4.3 Measuring and Quantifying Loan Portfolio Repayment Default Risk

The loan portfolio risks were categorised in Chapter 2, Section 2.3.2.1 into two broad categories, intrinsic and concentration risk (Cronje, 2013). In the context of this study, intrinsic risk refers to the risk that is inherent to each sector and each loan type of a bank. It cannot be measured in this study because comparative risk information such as loan defaults for each sector and each loan type is not available, regardless of its superiority in measuring loan portfolio risk (see, e.g., Louzis et al. (2012)). Only loan repayment default information, provided in the form of non-performing loans for the total loan portfolio, is available for individual banks and is used as proxy for overall bank loan portfolio risk. Considering the comparative concentration measurement employed in this study, this information also serves as an indicator of the effect of both sector concentration and loan type concentration on loan repayment default risks. In this research, the ratio of gross NPLs to total loans is used as a direct measure of the loan repayment default risk to which banks are exposed – the higher the NPL percentage is, the higher the loan portfolio risk is.

According to the attachment of Decree of Bank Indonesia Director No. 31/147/KEP/DIR in 1998, loans are categorised as non-performing when they are classified into substandard (3-6 months in arrears), doubtful (6-9 months in arrears), or loss (more than 9 months in arrears) categories (Bank Indonesia, 1998). The formula is:

$$\text{gross NPL} = \frac{(\text{Substandard} + \text{Doubtful} + \text{Loss loans})}{\text{Total Loans}} \quad \text{...(3)}$$

In Indonesia, banks must comply with loan-loss provision regulations: PBI 7/2/PBI/2005 jo PBI 8/2/PBI/2006 jo PBI 11/2/PBI/2009 (Bank Indonesia, 2005a, Bank Indonesia, 2006a, Bank Indonesia, 2009a). These regulations are intended to establish uniformity in loan risk management with rules regarding the assessment of collateral held against loans and assigning values to loan-loss provisions. These regulations, inter alia, establish the loan-loss provisions required from banks at a minimum of 1% of banks' current liquid assets. Minimum specific provisions also exist for loans for which repayment defaults have already occurred: 5% for the special mention category of loans; 15% for the sub-standard category of loans; 50% for the doubtful category of loans; and 100% for the loss category of loans. The aforementioned minimum provisions apply to the net loan values after the realisable collateral values held against such loans have been deducted from the total outstanding loan values. According to regulation PBI 2/11/PBI/2000 jo PBI 15/2/PBI/2013, Bank Indonesia stipulates a total maximum net NPL threshold of 5% for commercial banks (Bank Indonesia, 2013a).

4.4.4 Measuring and Quantifying Loan Portfolio Return

To measure the loan portfolio return, this study uses the ratio of loan interest income to average total loans. Banks' interest income from loans (after loan repayment defaults) constitutes the actual achieved return.

Below is the formula:

$$\text{LIntinc} = \frac{(\text{Loan interest income })}{\text{Total Loans at start of year} + \text{Total Loans at year end})/2} \text{.................................(4)}$$

Although loan interest income does not provide absolute accuracy in comparing bank pricing because of the existence of loan repayment defaults, the effect of loan repayment defaults is not substantial; the gross NPLs of the different bank types (Figure 5.18) differed by less than 5% in 2003 and by less than 3% from 2005 to 2011. Therefore, the effect of interest not repaid has a minor effect on the loan interest income ratio as a measure of the comparative pricing of banks. For example,

the maximum effect of a 5% difference in NPLs on a loan interest income ratio of 10% in 2003 will be .05 x .10 = 0.0005. This value remains an accurate measure of banks' loan investment returns. The loan interest income figures of the different banks are sourced from Infobank Magazine, LPPI and individual bank websites containing bank annual reports.

Although the loan interest income ratio serves as an indicator of the loan portfolio return of banks, it may be dependent on other aspects in addition to loan portfolio composition and loan repayment defaults. Aspects such as the loan and deposit mixes of banks, which reflect their liquidity and equity levels, may affect loan portfolio returns. Therefore, for comprehensiveness, liquidity and equity measures will be used as control variables when analysing the loan portfolio return (see Section 4.5).

4.5 Control Variables

The control variables consist of macroeconomic variables that affect all banks and bank-specific control variables pertaining to the individual banks comprising the sample.

4.5.1 Macroeconomic Variables

Several macroeconomic factors influence systematic credit risk (Aver, 2008). These factors include the inflation rate, employment rate, gross domestic product growth, stock index and exchange rate movements, and conjuncture fluctuations in the economy. The macroeconomic variables considered in this research are the Indonesian interest rate and GDP. The selection of these macroeconomic variables is based on research conducted by Glen and Mondragon-Velez (2011), who indicate that economic growth is the primary driver of loan portfolio performance, followed by interest rates.

4.5.1.1 Measuring GDP

The Indonesian government publishes two types of year-end GDP figures: constant GDP and current GDP. Given the influence of inflation and other factors on current

GDP figures, this research uses constant year-end GDP figures, which aligns with Valverde and Fernandez (2007).

4.5.1.2 Measuring the Interest Rate

The Bank Indonesia (BI) rate is the official benchmark interest rate. However, it is only available from 2006 onwards. Because the research period commences in 2003, this research uses the average 1-month Bank Indonesia certificate rate (1-month SBI), which is available for all years until 2009. SBI is the Bank Indonesia certificate that serves as the central bank's tool for controlling liquidity in the banking system (www.bi.go.id). For the years 2010 and 2011, the average BI rate is used because the 1-month SBI rate is no longer available. Statistical analysis of the two different rates confirms that the transition between the two should have no significant effect because their rates are 98.15% correlated over the 2006 to 2009 period during which both rates exist.

4.5.2 Bank-specific Control Variables

The bank-specific characteristics selected as control variables in this research are bank size, bank liquidity and bank equity. The selection of these variables is based on their relationship with bank loan portfolio composition and return.

4.5.2.1 Measuring Size

Bank size is used as a control variable because previous research by De-Haas et al. (2010) reveals that size is a determinant of bank loan portfolios in addition to ownership. Other studies that focus on bank loan portfolios also use bank size as a control variable (Tabak et al., 2011b, Berger et al., 2010, Behr et al., 2007). In this study, bank size is expressed as the natural logarithm of total assets. Regarding the use of the natural logarithm of total assets as a control variable, Berger et al. (2010) 1423 explicitly state:

"The continuous variable such as ln(assets) is normally expected to be a superior regressor than some arbitrary size dummies, except in the case when there is a non-monotonic relationship between size and performance."

4.5.2.2 Measuring Equity

In addition to bank size, studies on loan portfolio composition conducted by Acharya et al. (2002), Hayden et al. (2006), Berger et al. (2010), Behr et al. (2007) use bank equity as a control variable. This research includes equity as a control variable given its potential impact on loan portfolio return, as indicated by these aforementioned researchers. The following formula is used:

equity ratio = total equity/ total assets……...(5)

To avoid capital risk, banks should maintain a sufficient level of capital. This risk will decrease if the probability of losses decreases or the proportion of capital increases (Hogan et al., 2004 248). By reducing capital risk, banks experience lower returns. In this context, when banks increase the proportion of capital to reduce capital risk, the expected return will decrease because the average cost of equity exceeds the cost of debt. Conversely, when banks increase their financial leverage, they may achieve higher returns despite the increase in risk.

Notwithstanding the risk-return trade-off, regulators' capital adequacy requirements serve as another factor that affects the percentage of bank capital. Flannery (1998) suggests that although capital regulations tend to induce banks to diversify their portfolios to a lesser extent than if they were unregulated, the regulations nevertheless reduce a bank's loan portfolio risk. Although banks typically reduce loans to improve their capital ratios, Hyun and Rhee (2011) found that banks tend to eliminate relatively high-risk weighted assets when they need to reduce loans to recover from weakened capital positions.

4.5.2.3 Measuring Liquidity

The financial fragility hypothesis advanced by Diamond and Rajan (2000) states that the higher the bank capital ratio, the lower is the liquidity creation because a higher capital ratio implies less monitoring, which in turn leads to less liquidity creation. Similarly to the financial fragility hypothesis, the crowding out of deposits hypothesis of Gordon and Winton (2000) states that there is a negative relationship between the capital ratio and liquidity creation; a higher capital ratio leads to the

potential for deposits to be crowded out, which reduces liquidity creation. Both hypotheses are discussed by Berger and Bouwman (2009). Conversely, the risk absorption hypothesis states that the higher the capital ratio, the greater is a bank's ability to create liquidity because a higher capital ratio acts as a buffer to absorb the greater risk created by higher liquidity (Distinguin et al., 2013). Maintaining high liquidity when the capital ratio is high is also very important because high liquidity normally serves as a means of reducing interest expenses as a response to support increased shareholder returns when financial leverage declines.

Milne (2002) suggests that the impact of risk-weighted capital on decisions concerning loan portfolio allocations depends on the liquidity of the assets involved. When assets can be traded in a liquid market or banks can realise the value of assets, portfolio allocations are unaffected by capital regulations.

It is evident from this statement that in addition to capital, liquidity is also an important factor affecting bank loan portfolios. This research includes liquidity as a control variable using the following formula:

liquidity ratio = total loans/ total deposits……...(6)

The typical interpretation of this ratio is that it is negatively related to bank liquidity. Thus, the lower the ratio, the more liquid a bank is.

4.6 Summary of All Variables Used

Table 4.8 reports all variables, their definitions and how they are measured.

Table 4.8 Variables Definition and Measurement

No	Variable	Definition	Measurement	Remarks
1 a.	Bank ownership Types: Government-owned Banks	Banks with government ownership of 50% or more of total bank shares	$GBi = \sum_{j=1}^{J} s_{ji}$	GB_i= the government's share in bank *i* S_{ji}=share of bank *i* owned by government, as shareholder j i=commercial banks in Indonesia $_j$=bank's shareholders
b.	Bank ownership Types: Domestic-owned Banks	Banks with private-domestic ownership of 50% or more of total bank shares	$DBi = \sum_{j=1}^{J} s_{ji}$	DB_i= the private-domestic's share in bank *i* S_{ji}=share of bank *i* owned by private-domestic, as shareholder j i=commercial banks in Indonesia $_j$=bank's shareholders
c.	Bank ownership Types: Foreign-owned Banks	Banks with foreign ownership of 50% or more of total bank shares	$FBi = \sum_{j=1}^{J} s_{ji}$	FB_i= the foreign's share in bank *i* S_{ji}=share of bank *i* owned by foreigners, as shareholder j i=commercial banks in Indonesia $_j$=bank's shareholders
2	Loan Portfolio Concentration (HHI)	The risk arising from an uneven distribution of counterparties in credit or any other business relationships or from a concentration in business sectors or geographical regions which is capable of generating losses large enough to jeopardise an institution's solvency (Deutsche Bundesbank, 2006)	$HHI = \sum_{i=1}^{N} \left(\frac{p_i}{Q}\right)^2$	HHI= Herfindahl- Hirschman Index Q= $\sum_{i=1}^{10} p_i$ pi = the percentage of credit to each sector N = 10 for E-HHI and 3 for THHI
3	Loan Repayment Default Risk (NPL)	A risk inherent to each industry, region or product of a bank (Cronje, 2013)	NPL/Total Loans	NPL=(Substandard+Doubtful+Loss)Loans
4	Loan Portfolio Return (LIntinc)	The interest income obtained from bank's loan portfolio	Loan Interest Income/ Average Total Loans	
5	GDP (GDP)	The market value of all officially recognized final goods and services produced within a country in a year, or other given period of time	Constant GDP	The end of year GDP is obtained from www.bi.go.id

Table 4.8 Variables Definition and Measurement (continued)

No	Variable	Definition	Measurement	Remarks
6	Interest Rate (INT.RATE)	The money paid by a borrower (debtor) for the use of money that they borrow from a lender (creditor)	1-month SBI Rate	The end of year SBI Rate is obtained from www.bi.go.id
7	Size (SIZE)	The total assets of each individual bank	Ln of Total Assets	
8	Equity (EQUITY)	Book value of shareholders' fund (Hogan et.al, 2004)	Total Equity/Total Assets	
9	Liquidity (LQDT)	Ability to convert an asset into cash readily (Hogan et.al, 2004)	Total Loans/Total Deposits	

4.7 Data Analysis

This research is based on the analysis of quantitative data, specifically numerical data in ratio scale of measurement. The descriptive statistics for all variables are provided for each of the nine years (2003 to 2011) to obtain an understanding of the trends and the extent of deviations in the data. The statistics consist of the annual means, medians, maximums, minimums and standard deviations for all variables.

Univariate statistical analysis is performed, specifically using tests of means. First, the univariate approach is used to assess the change in loan portfolio structures (concentration and composition), loan repayment default risk and loan portfolio return over the nine years spanning the 2003-2011 period covering the 2003-2007 post-Asian crisis and pre-GFC period and the 2008 -2011 post-GFC period. Second, it serves to determine the differences in each variable across the three bank ownership types in 2003, 2007 and 2011. Correlation matrix data on the Pearson correlation coefficients are used in association with the univariate statistical analysis to obtain information on the associations among dependent, independent and control variables and assess potential multicollinearity issues.

Preliminary analysis reveals that the data are not normally distributed; therefore, this research uses the non-parametric Mann-Whitney test (paired samples) and the Wilcoxon signed rank sum test (non-paired samples) to assess the significance of the difference over time for each bank ownership type (bank ownership types across

years). This approach entails a comparison of the loan portfolio structures (concentration and composition), loan repayment default risk and loan interest return for each bank ownership type (GBs, FBs, and DBs) at three key points in time: 2003, 2007 and 2011. This step is followed by the Kruskal-Wallis test to determine differences in loan portfolio concentration, loan repayment default risk and loan interest return across bank ownership types (government-, domestic – and foreign-owned banks) in each of the key years: 2003, 2007 and 2011 (years across bank ownership types).

Finally, this research applies multivariate statistics to determine the impact of different bank ownership types, their loan portfolio concentration and loan repayment default risk on their loan portfolio return. The tests involve the use of multiple regression and panel data regression.

The univariate statistical analysis and multiple regression approaches are applied for each of the three key years (2003, 2007 and 2011), whereas the panel data approach is applied to the full nine-year research period. The multiple regression results for each of the three key years reveal the effect of bank ownership types, their loan portfolio concentration and loan repayment default risk on banks' loan portfolio return at specific points in time (2003, 2007 and 2011). The panel data regression captures the variation in behaviour across all years and accounts for unobservable heterogeneity in the model, which would not be possible with a cross-sectional multivariate regression.

Prior to conducting the multiple regression model for 2003, 2007, and 2011, an assessment of model validity in terms of normality, linearity, homoscedasticity and multicollinearity is conducted because the use of multiple regression requires several assumptions.

In line with Aivazian et al. (2005), two tests are conducted to identify which empirical methodology, pooled regression (ordinary least squares) or fixed or random effects, is most appropriate. First, the Breusch-Pagan Lagrangian multiplier test is used to select between the pooled OLS and fixed-effects models. The null hypothesis is that the individual effect (μ) is equal to zero. The test determines

whether the estimated variance of the residuals from a regression depends on the values of the independent variables. If the test confirms that the variance of the residuals is dependent on the values of the independent variables, then the null hypothesis is rejected and OLS is not suitable for the model because of the existence of heteroscedasticity. Second, the Hausman specification test is performed to choose between fixed and random-effects models. The acceptance of the null hypothesis indicates that the individual effects are uncorrelated with the independent variables, and as a result, fixed- and random-effects models should not be significantly different. If the null hypothesis is rejected, then the fixed- effects model is preferable because it allows the model's error term to be correlated with the independent variables. The fixed-effects model is suitable for capturing time-invariant, individual-specific effects (heterogeneity) among individual banks.

The following panel data regression model is estimated to examine whether loan portfolio performance varies significantly across different bank ownership types:

$$Return_{it} = \alpha + \beta OWN_{it} + \lambda EHHI_{it} + \gamma THHI_{it} + \zeta NPL_{it} + \eta controls_{it} + \delta MACRO_t + \varepsilon_{it} \quad \ldots(7)$$

Where:

$Return_{it}$ = loan portfolio return for bank *i* in year *t*

OWN_{it} = vector of ownership structure variables (comprises of GB and FB as stated in Table 4.7)

$EHHI_{it}$ = loan portfolio concentration (based on economic sector) variables

$THHI_{it}$ = loan portfolio concentration (based on loan types) variables

NPL_{it} = loan portfolio repayment default risk for bank *i* in year *t*

$MACRO_t$ = vector of macroeconomic control variables

$Controls_{it}$ = vector of bank-specific control variables

$\alpha, \beta, \delta, \gamma, \lambda, \zeta$ = regression coefficients; and

ε_{it} = the disturbance term.

The model is first estimated by including year dummies to control for cyclical effects, followed by the application of the interaction of the main variables with the GFC to determine the effect of the GFC on loan portfolio returns.

The data analysis is conducted using the STATA software. When estimating a fixed-effects panel data regression in STATA, there are different ways to measure R^2. Based on Greene (2012) explanation concerning the difference between R^2 obtained from fixed effect (xtreg) and areg, the R^2 figure is obtained by first estimating the panel data model using the xtreg approach for statistical analysis and then using the areg approach to obtain the R^2 that includes the group effects.

4.8 Summary

This chapter describes the research methodology employed in this study. It first provides an overview of the research framework, the sample, the research period and the data collection process. The research emphasises the changes and differences in loan portfolio concentration, composition, risk and performance for different bank ownership types in Indonesia over the period 2003-2011.

All non-Islamic Indonesian commercial banks constitute the population of the study. The sample consists of 109 banks, yielding 981 observations over a 9-year research period from 2003 to 2011. This research employs secondary data collected from the Bank Indonesia library, the LPPI library, and Infobank Magazine.

Three main independent variables are applied in this research: bank ownership types, loan portfolio concentration and loan repayment default risk. A number of macroeconomic and bank-specific control variables are used in conjunction with the main independent variables. The macroeconomic variables are the prevailing Indonesian interest rate and GDP. The bank-specific control variables are bank size, bank liquidity ratios and bank equity ratios. The variable definitions and measures are summarised in Table 4.8.

The data analysis includes descriptive, univariate and multivariate statistical procedures. The descriptive statistics for all variables are provided for each of the three key years (2003, 2007, 2011) to obtain an understanding of the trends and the extent of deviations in the data.

Univariate statistical analysis in the form of tests of means is conducted. First, it is used to assess the change in loan portfolio structures (concentration and

composition), loan repayment default risk and loan portfolio return over the nine-year period from 2003 to 2011 and for the 2003-2007 post-Asian crisis and pre-GFC period and the 2007-2011 post-GFC period. Second, univariate analysis is applied to identify differences in each variable across the three bank ownership types in 2003, 2007 and 2011.

Finally, this research employs multivariate analysis to determine the impact of different bank ownership types, their loan portfolio concentration and loan repayment default risk on banks' loan portfolio returns. The tests involve the use of multiple regression and panel data regression.

The next chapter contains the findings, including the descriptive statistics, univariate analysis and multivariate analysis explained in this chapter.

Chapter 5
FINDINGS AND DISCUSSION

5.1 Introduction

The methodology applied in this study has been described in detail in Chapter 4. This chapter contains the analysis of the changes and differences in the loan portfolio structures (composition and concentration), loan repayment default risk, and loan portfolio returns between government-owned banks (GBs), foreign-owned banks (FBs) and domestic-owned banks (DBs) in Indonesia. First, descriptive and univariate statistics are provided to reveal how the aforementioned variables vary over the 2003–2011 study period and across bank types. These statistics are followed by regression analysis of the effect of different bank ownership types, loan portfolio concentration, and loan repayment default risk on loan portfolio returns.

5.2 Descriptive and Univariate Statistics

This section first provides information on the number of different bank types and their comparative loan exposures. Then, descriptive and univariate statistics are used to compare the loan portfolio structures (composition and concentration), loan repayment default risk, and loan portfolio returns of different bank types in each of the three key years (2003, 2007 and 2011).

5.2.1 Bank Ownership Types

As stated in Chapter 3, the number of Indonesian commercial banks has declined since the Asian financial crisis because of bank restructuring in the form of bank closures and mergers and acquisitions (see Chapter 1, Figure 1.2). Figure 5.1 depicts the number of banks in the sample based on ownership types. The number of FBs increased from 27 to 37, whereas the number of DBs declined by 10 over the 2003 to 2011 period. In contrast to FBs and DBs, the number of GBs remained unchanged (30 banks). The status of only one FB changed to a GB in 2008, but in the following year, it reverted to its previous ownership type - FB.

Figure 5.1 Number of Banks Based on Ownership Types

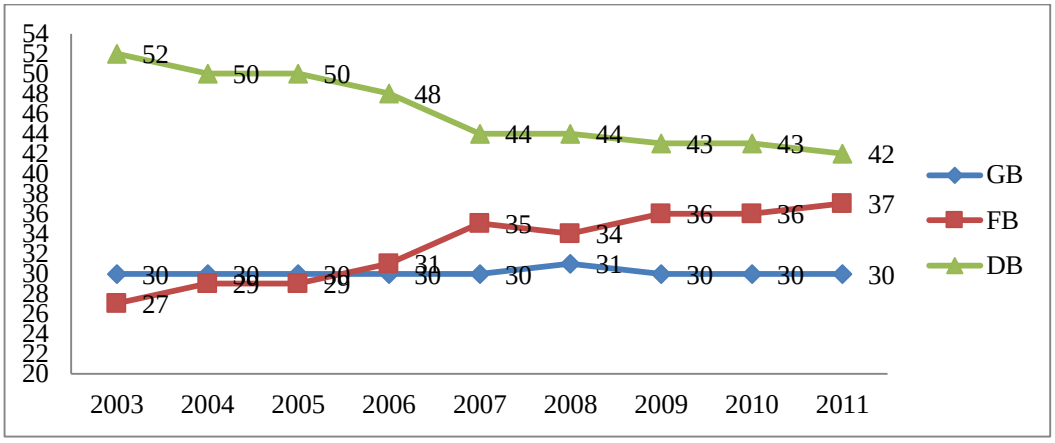
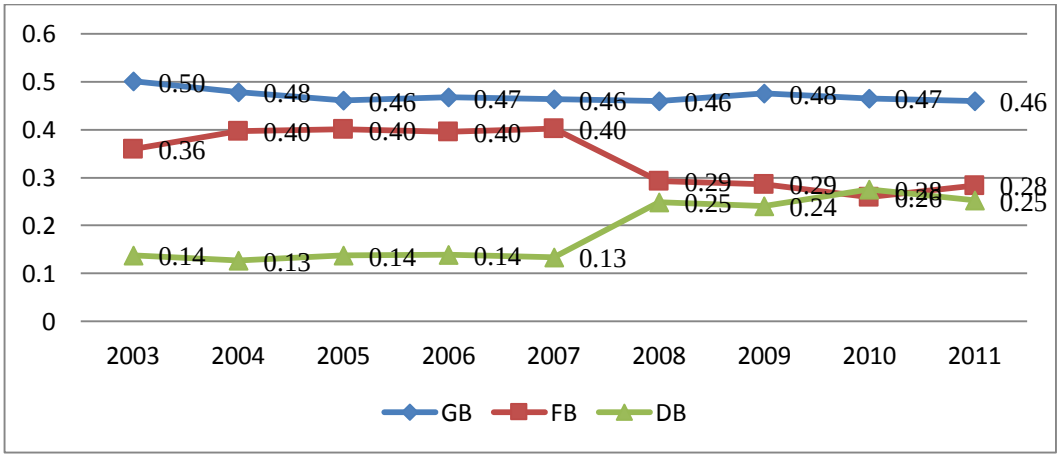


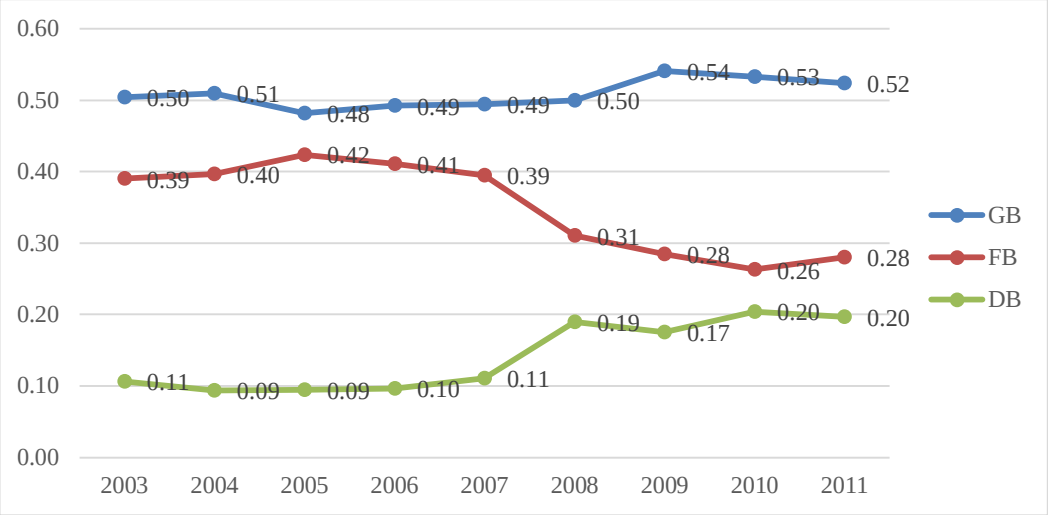
Figure 5.2 indicates that GBs are the largest type of bank, holding nearly 50% of the aggregate bank assets in Indonesia, although they represent only 25% of the total number of banks as indicated in Figure 5.1. It is also evident from a comparison of Figures 5.1 and 5.2 that the proportional assets of FBs declined over the study period amidst the increase in the number of FBs. The average size of FBs far exceeded that of DBs in 2003 but declined to a level close to that of DBs in 2011. However, the average size of DBs increased over the full study period. In 2003, they represented 48% of all banks (52/109) but only 14% of aggregate total assets. In 2011, these banks represented 39% of all banks (42/109) with a 25% share of aggregate total assets.

Figure 5.2 Market Share of Government-, Foreign-, and Domestic-owned Banks (as Percentage of Total Assets of all Banks)



The proportions of total loans attributable to the different bank types are reflected in Figure 5.3 for the period from 2003 to 2011. The total aggregate amount of bank loans in 2011 consisted of 52% GB loans, 28% FB loans and 20% DB loans. The differences in the amounts of the loan portfolios of all bank types are reasonably aligned with the differences in their total assets as depicted in Figure 5.2.

Figure 5.3 Proportional Total Loans of Government-, Foreign-, and Domestic-owned Banks



5.2.2 Bank Loan Portfolio Concentration

This section presents descriptive and univariate statistics regarding the loan portfolio concentration of the Indonesian GBs, FBs and DBs.

5.2.2.1 Bank Loan Portfolio Concentration Based on Economic Sector (EHHI)

Loan portfolio concentration is measured by the Herfindahl-Hirschman Index (HHI) (see Section 4.4.2 b). The portfolio concentration of GBs, FBs and DBs based on economic sectors (EHHI) and loan types (THHI) is graphically depicted in Figures 5.4 and 5.5.

The average sectoral concentration levels (EHHI) of the different bank types are depicted in Figure 5.4. The combined EHHI concentration levels of all banks decreased slightly over the total research period, which indicates an overall tendency for banks to diversify over time.

Figure 5.4 Loan Portfolio Concentrations of the Different Bank Ownership Types Based on Economic Sectors

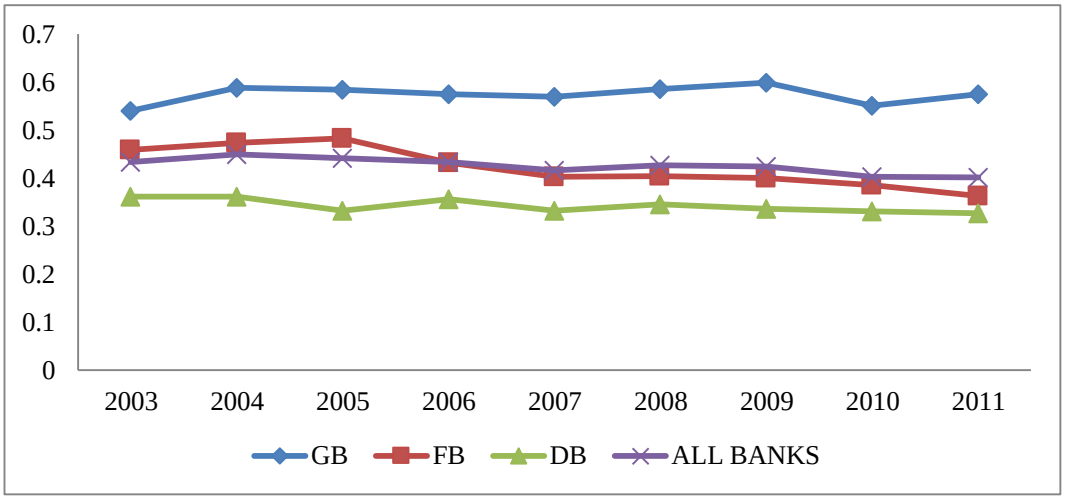


Table 5.1 contains the descriptive EHHI statistics for all the banks as a combined group and for the different bank ownership types. It is used to assess the change in bank loan portfolio concentration over the nine-year period within the context of the 2003-2007 post-Asian crisis and pre-GFC period, the 2007-2011 post-GFC period and the full 2003-2011 period. Therefore, the extent of bank loan portfolio concentration is compared in each of three key years (2003, 2007 and 2011) for the 109 banks constituting the sample (methodology described in Chapter 4, Section 4.3.1).

The EHHI mean for all bank ownership types as a combined group decreases from 43.4% in 2003 to 40.2% in 2011 and indicates overall EHHI diversification over the nine-year study period.

When considering the EHHIs of the different bank ownership types, it is evident that the loan portfolios of GBs are the most concentrated and that this concentration increased from 2003 to 2011. The increase is substantial in the first period, 2003–2007, followed by a slight increase during the 2007–2011 period. The concentration risk of FBs is 6.8% less than that of GBs in 2003 but exceeds that of DBs in all years, although it exhibits the largest decrease in concentration (11.8%) from 2003 to 2011. This substantial decline reduced the difference in the level of concentration between FBs and DBs from 10% in 2003 to 1.8% in 2011. The major decrease occurred between 2003 and 2007 and continued more slowly thereafter. The loan portfolio

concentration of DBs is the lowest of all bank types and exhibits a decrease in concentration of 3.6% over the full study period. This change is substantially smaller than that of FBs but follows the same trend, with a larger decrease between 2003 and 2007 than in the 2007 to 2011 period.

Table 5.1 Descriptive Statistics of the Loan Portfolio Concentration (EHHI) for the Different Bank Ownership Types

	2003	2007	2011
Panel A: All banks			
Mean	0.434	0.416	0.402
Std. Dev.	0.214	0.351	0.223
Minimum	0	0.164	0.144
Maximum	1	0.994	1
Kurtosis	3.664	3.270	3.311
Skewness	1.149	1.077	1.140
Panel B: Government-Owned Banks			
Mean	0.531	0.561	0.577
Std. Dev.	0.232	0.236	0.243
Minimum	0.233	0.164	0.144
Maximum	0.984	0.974	0.964
Kurtosis	2.027	1.860	1.966
Skewness	0.515	*-0.045*	-0.172
Panel C: Foreign-Owned Banks			
Mean	0.463	0.397	0.345
Std. Dev.	0.245	0.163	0.187
Minimum	0	0.192	0.145
Maximum	1	0.883	1
Kurtosis	3.017	4.752	8.019
Skewness	0.613	1.346	2.228
Panel D: Domestic-Owned Banks			
Mean	0.363	0.333	0.327
Std. Dev.	0.157	0.159	0.166
Minimum	0.186	0.173	0.169
Maximum	0.995	0.995	0.960
Kurtosis	9.266	8.780	6.783
Skewness	2.379	2.231	1.875

Legend: The descriptive statistics shown in Panel A-D are expressed in percentage. EHHI=Loan Portfolio Concentration based on Economic Sectors. The number in italic means that the data is normally distributed based on the value of skewness which reside in the range of -0.5 and +0.5. According to Bulmer (1979) "if the skewness is between -0.5 and +0.5, the distribution is approximately symmetric."

The Wilcoxon signed rank sum test (see Chapter 4, Section 4.7) is applied to verify the statistical significance of the EHHI changes for GBs and all banks combined, whereas the Mann-Whitney test is used for each of the remaining bank ownership types (FBs and DBs) to determine whether the differences across sub-periods are statistically significant (Table 5.2). The analysis reveals that for all bank types combined, the overall concentration (diversification) of banks in Indonesia decreased (increased) over the study period (p-values $\leq$.10). Certain regulations such as the legal lending limits that Bank Indonesia imposes on banks and other micro-organisational and macroeconomic factors may have contributed to the overall trend towards loan portfolio diversification.

Regarding individual bank types, the relevant applied tests do not indicate significant changes in concentration levels for GBs; however, the decreases in FB concentration from 2007 to 2011 and from 2003 to 2011 are significant at a p-value level of $\leq$.05. In the case of DBs, the decreases in concentration from 2003 to 2007 (p-value $\leq$.10) and over the full 2003 to 2011 period (p-value $\leq$.05) are significant. The decrease is not significant in the post-GFC period.

Panel B, Table 5.2 presents the Kruskal-Wallis results. The EHHI differences across bank ownership types (GBs, FBs and DBs) are statistically significant in 2003, 2007 and 2011. Thus, definite sectoral portfolio concentration differences exist among the different bank types in the key years. Previous research indicates that differences in organisational structures, access to liquidity, exposure to asymmetric information (Degryse, 2012), motives, technology and innovation capacity (Berger 2005a) across different bank ownership types may affect their loan portfolio strategies.

Based on the information from Figure 5.3, Table 5.1 and Table 5.2, it can be concluded that the average increase in the concentration levels of GBs during the 2003–2007 period and the 2007–2011 period results from a non-representative number of GBs, as indicated by the skewness and kurtosis of the distribution in Table 5.1. The increase in GB concentration therefore appears to primarily derive from bank-specific characteristics such as the sizes of the GBs. Furthermore, the differences between the concentration levels of GBs and those of FBs and DBs increased to the greatest extent from 2003 to 2007 but also increased further in the

2007 to 2011 period, albeit at a slower rate. This scenario resulted from the significant and rapid decline in concentration among FBs during the same period that GB concentration increased (2003 to 2007) and the continuing decrease of both FB and DB bank concentration over the post-GFC period from 2007 to 2011. The concentration levels of DBs remained the lowest in 2011, notwithstanding the large decrease in the concentration levels of FBs over the full study period.

Table 5.2 Univariate Statistics of the Loan Portfolio Concentration (EHHI) for the Different Bank Ownership Types

	2003-2007	2007-2011	2003-2011
Panel A: All banks			
Mean Difference	-0.018	-0.014	-0.032
Z	2.260	1.577	2.462
Prob> z	0.024**	0.115	0.014**
No. of Observations	109	109	109
Panel B: Government-Owned Banks			
Mean Difference	0.03	0.016	0.046
Z	0.554	0.384	0.843
Prob> z	0.579	0.701	0.399
No. of Observations	60	60	60
Panel C: Foreign-Owned Banks			
Mean Difference	-0.066	-0.052	-0.118
Z	-1.100	-2.112	-2.311
Prob> z	0.271	0.035**	0.021**
No. of Observations	62	72	64
Panel D: Domestic-Owned Banks			
Mean Difference	-0.03	-0.006	-0.036
Z	-1.890	-0.683	-2.160
Prob> z	0.059*	0.495	0.031**
No. of Observations	96	86	94
Panel E: Kruskal Wallis Test	**Year across Bank Ownership Types**		
	p-value		
2003	0.002***		
2007	0.000***		
2011	0.000***		

Legend: Wilcoxon-signed rank sum tests for the paired samples of all banks and GBs are performed by comparing 2003 with 2007, 2007 with 2011, and 2003 with 2011 since the number of banks in each time period is equal. The Mann-Whitney tests are conducted for FBs and DBs due to differences in the number of banks in the years of analysis. The percentage change in the means of EHHI ($EHHI_t$-$EHHI_{t-1}$) between two years is shown as mean difference. ***, **, and * respectively represent 1%, 5%, and 10% significance levels.

5.2.2.2 Bank Loan Portfolio Concentration Based on Loan Types (THHI)

The average loan type concentration levels of the different bank types are depicted in Figure 5.5. The THHIs of all bank types are very similar and do not change

substantially over the period from 2003 to 2008. Only from 2009 and beyond does the concentration of DBs exhibit definite changes relative to that of FBs and GBs, which remain very similar.

Figure 5.5 Loan Portfolio Concentration of Government-, Foreign-, and Domestic-owned Banks Based on Loan Types

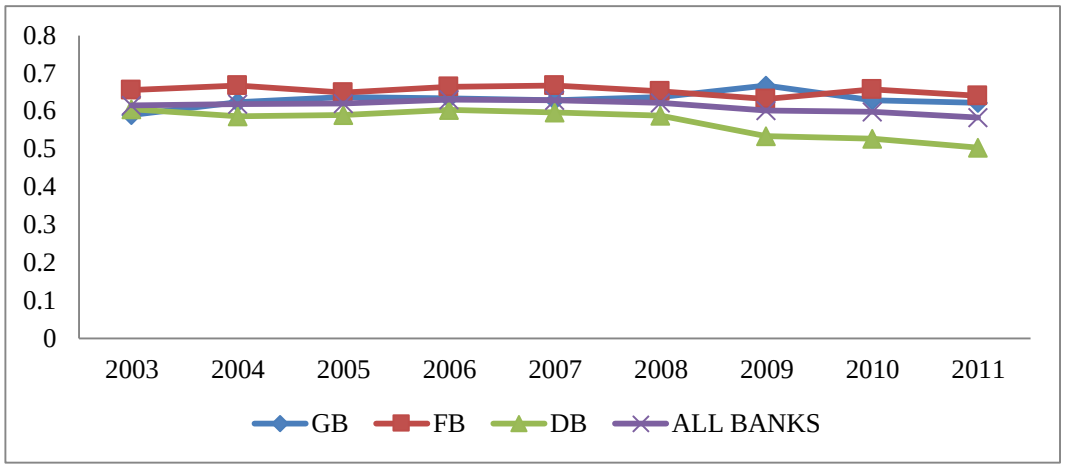


Table 5.3 indicates that the combined THHI for all banks decreased from a mean of 61.5% in 2003 to a mean of 58.2% in 2011, although a minor increase in concentration occurs between 2003 and 2007. In general, the THHI levels of all bank types are higher than their EHHI levels contained in Table 5.1. This phenomenon occurs because there are only three loan types to which the THHI measurement applies compared to ten different sectors for the EHHI measurement (refer to Section 4.4.2a). FBs show the highest THHI levels, followed by GBs. This order differs from the situation regarding EHHI levels, wherein GBs exhibit the highest levels. Thus, considering both EHHI and THHI, it is evident that, although GBs are more concentrated in terms of the sectors to which they provide loans than FBs, they are less concentrated in terms of the loan types that they provide to their more concentrated markets. DBs have the lowest loan type concentration. This result is similar to their comparative EHHI levels and indicates that these banks exhibit the lowest sectoral and loan type concentration.

When considering the changes in the THHIs of the individual bank types, it becomes evident that GB and FB concentration increased from 2003 to 2007, whereas the THHI levels of DBs decreased slightly. In the period thereafter (post-GFC period

from 2007 to 2011), the THHI levels of GBs and FBs decreased slightly, but DBs exhibited a more substantial decrease. The initial increase (2003 to 2007) in the GB THHI level and the substantial decrease in the 2007 to 2011 DB concentration level increased the THHI difference among the different bank ownership types over the full sample period (2003 to 2011).

Table 5.3 Descriptive Statistics of the Loan Portfolio Concentration (THHI) for the Different Bank Ownership Types

	2003	2007	2011
Panel A: All banks			
Mean	0.615	0.629	0.582
Std. Dev.	0.202	0.183	0.195
Minimum	0	0.334	0.333
Maximum	1	1	1
Kurtosis	2.529	2.103	2.513
Skewness	*0.240*	*0.316*	0.790
Panel B: Government-Owned Banks			
Mean	0.587	0.623	0.621
Std. Dev.	0.186	0.165	0.196
Minimum	0.375	0.378	0.144
Maximum	0.907	0.953	0.964
Kurtosis	1.780	1.799	1.966
Skewness	0.578	*0.202*	-0.172
Panel C: Foreign-Owned Banks			
Mean	0.667	0.676	0.641
Std. Dev.	0.228	0.197	0.231
Minimum	0	0.357	0.345
Maximum	1	0.995	1
Kurtosis	3.937	1.779	1.668
Skewness	-0.687	*0.007*	0.344
Panel D: Domestic-Owned Banks			
Mean	0.604	0.596	0.503
Std. Dev.	0.196	0.179	0.127
Minimum	0.337	0.334	0.344
Maximum	0.997	1	0.957
Kurtosis	2.227	2.751	5.439
Skewness	0.656	0.592	1.356

Legend: The descriptive statistics shown in Panel A-D are expressed in percentage. THHI=Loan Portfolio Concentration based on Loan Types. The numbers in italic means that the data is normally distributed with skewness in the range of -0.5 and +0.5. According to Bulmer (1979) "if the skewness is between -0.5 and +0.5, the distribution is approximately symmetric."

Wilcoxon signed rank sum tests (for all banks combined and GBs) and Mann-Whitney tests (for FBs and DBs) are applied (Table 5.4) to verify the statistical

significance of the THHI changes contained in Table 5.3. The analysis reveals that changes in the THHI means for the full study period (2003 to 2011) are significant (p-value ≤.05) when all bank types are considered. However, the THHIs of the GBs and FBs alone do not exhibit any statistically significant changes. Only the changes in the THHI levels of DBs are significant (p-value of ≤.01) in the 2003 to 2007 and the 2007 to 2011 periods. Whereas only DBs show significant THHI changes over time, the THHI differences across all bank types (GBs, FBs, and DBs) are significant in 2003 (p-value ≤.05) and 2011 (p-value ≤.01) but not in 2007. Thus, although changes over time are not evident for all of the different bank ownership types, they do differ significantly from one another at both the beginning and the end of the study period. Similarly to the case of EHHI, differences in bank characteristics across bank ownership types may have affected their loan portfolio strategies.

Table 5.4 Univariate Statistics of the Loan Portfolio Concentration (THHI) for the Different Bank Ownership Types

	2003-2007	2007-2011	2003-2011
Panel A: All banks			
Mean Difference	0.014	-0.046	-0.032
Z	-0.443	3.264	1.965
Prob> z	0.658	0.001***	0.049**
No. of Observation	109	109	109
Panel B: Government-Owned Banks			
Mean Difference	0.036	-0.002	0.034
Z	0.769	-0.044	0.917
Prob> z	0.442	0.965	0.359
No. of Observation	60	60	60
Panel C: Foreign-Owned Banks			
Mean Difference	0.009	-0.035	-0.025
Z	-0.021	-0.817	-0.788
Prob> z	0.983	0.414	0.430
No. of Observation	62	72	64
Panel D: Domestic-Owned Banks			
Mean Difference	-0.008	-0.093	-0.101
Z	0.101	-2.583	-2.518
Prob> z	0.919	0.010***	0.012**
No. of Observation	97	86	95

Table 5.4 Univariate Statistics of the Loan Portfolio Concentration (THHI) for the Different Bank Ownership Types (continued)

Panel E: Kruskal Wallis Test	Year across Bank Ownership Types
	p-value
2003	0.092*
2007	0.204
2011	0.009***

Legend: The Wilcoxon-signed rank sum tests for the paired samples of all banks and GBs are performed by comparing 2003 with 2007, 2007 with 2011, and 2003 with 2011 since the number of banks in each time period is equal (paired sample). The Mann-Whitney tests are conducted for FBs and DBs due to differences in the number of banks in the year of analysis. The percentage change in means of THHI ($THHI_t$-$THHI_{t-1}$) between two years is shown as mean difference. There is a statistically significant decrease in the loan portfolio concentration based on loan types over the nine-year study period. ***, **, and * respectively correspond to 1%, 5%, and 10% significance levels.

Table 5.5 summarises the univariate results for EHHI and THHI. As indicated in the table, the EHHI and THHI of GBs do not change significantly during the post-Asian or post-GFC periods. Changes in the THHIs for FBs and DBs are also not significant during the post-Asian crisis period from 2003 to 2007. Only the change in the EHHI of DBs is significant over this period. During the post-GFC period, FBs exhibit significant EHHI changes and DBs exhibit significant THHI changes. However, both EHHI and THHI changes over the full period (2003 to 2011) are significant based on combined information on all bank types, notwithstanding the absence of such significance in the individual analysis of THHI changes for FBs and GBs.

In summary, the overall EHHI and THHI of Indonesian banks change significantly over the study period of 2003 to 2011 and differ significantly from one another in the majority of key years. The changes in EHHI represent diversification by FBs and DBs. However, when the EHHI and THHI of all bank ownership types are combined, this combination reveals overall diversification during the 2003 to 2011 period, which is in line with previous studies conducted by Kamp (2005) indicating that German banks also tend to diversify over time.

Table 5.5 Summary of Univariate Statistics for Percentage Loan Portfolio Concentration Changes Over Time

Period	ALL BANKS		GB		FB		DB	
	EHHI	THHI	EHHI	THHI	EHHI	THHI	EHHI	THHI
2003-2007	-S**	NS	NS	NS	NS	NS	-S*	NS
2007-2011	NS	-S***	NS	NS	-S**	NS	NS	-S***
2003-2011	-S**	-S**	NS	NS	-S**	NS	-S**	-S**

NS : Not Significant; +S : Significant Increase; -S : Significant Decrease

5.2.3 Loan Portfolio Composition

Bank ownership types affect bank loan portfolio composition because the bank's type may imply a focus on different customer types. This concept is confirmed by De-Haas et al. (2010): bank loan portfolios are determined by bank characteristics such as ownership and size. As indicated by Laeven and Levine (2009), the extent of bank loan portfolio risk-taking must be linked with a bank's ownership structure.

The loan portfolio composition of the bank groups in terms of the groups' exposure to different economic sectors and loan types is discussed in the ensuing sections. The discussion focuses on the changes that occurred over the study period (2003 to 2011) and the differences in their portfolio compositions. Loan portfolio composition is described in terms of ten economic sectors according to the Bank Indonesia classification[42].

5.2.3.1 Based on Economic Sectors

a) All Banks

Table 5.6 displays the descriptive loan portfolio composition statistics for all banks. The bank loan portfolio composition is measured in each of the three key years (2003, 2007 and 2011) for the 109 banks in the sample.

The means of the percentage of loans for all banks allocated to 6 of the 10 sectors increased from 2003 to 2011. These increases primarily occurred during the 2007 to 2011 period. Conversely, 4 sectors experienced a decline in the percentage of loans

[42] The sectoral classification into 10 sectors is effective until December 2011 and is based on Bank Indonesia circular letter No. 2/21/PBI/2000

allocated to them from 2003 to 2011. Similarly to the sectors that experienced increases over the 2003 to 2011 period, not all decreases occurred throughout the total 2003 to 2011 period. Three of these sectors experienced increases in the percentage of loans allocated to them between 2003 and 2007, with the declines becoming more prominent in the 2007 to 2011 period. Therefore, the GFC significantly affected the changes in banks' loan exposures to different sectors. Only the manufacturing industry experienced a significant decline in the percentage of bank loans over the total 2003 to 2011 period, whereas the other sectors were affected differently in terms of loan percentage allocation in the pre-and post-GFC periods.

Overall, the most significant differences in sectoral loan allocation occurred in the 2007-2011 period, thus providing evidence of the adjustment made by the banks because of the GFC.

Table 5.6 Descriptive Statistics of the Percentage Loan Portfolio Composition of All Banks

Variables	2003				
	Median	Mean	Std. Dev.	Min	Max
Agri	0.008	0.030	0.061	0.000	0.496
Mining	0	0.009	0.041	0.000	0.346
Manuf	0.141	0.211	0.237	0.000	0.978
Elec	0	0.005	0.030	0.000	0.303
Constr	0.019	0.049	0.107	0.000	0.992
Trade	0.174	0.214	0.197	0.000	1.000
Transp	0.008	0.024	0.038	0.000	0.224
Bus_Serv	0.062	0.093	0.108	0.000	0.482
Soc_Serv	0	0.011	0.025	0.000	0.183
Others	0.276	0.345	0.290	0.000	0.998
Variables	**2007**				
	Median	**Mean**	**Std. Dev.**	**Min**	**Max**
Agri	0.009	.029	.055	0	.429
Mining	0.000	.009	.024	0	.149
Manuf	0.119	.174	.195	0	.937
Elec	0.000	.002	.008	0	.053
Constr	0.024	.050	.079	0	.405
Trade	0.198	.215	.168	0	.716
Transp	0.009	.022	.036	0	.250
Bus_Serv	0.084	.109	.119	0	.530
Soc_Serv	0.003	.020	.074	0	.731
Others	0.266	.370	.297	0	.997

Table 5.6 Descriptive Statistics of the Percentage Loan Portfolio Composition of All Banks (continued)

Variables	2011				
	Median	Mean	Std. Dev.	Min	Max
Agri	0.010	0.040	0.099	0.000	0.918
Mining	0.002	0.020	0.033	0.000	0.197
Manuf	0.104	0.153	0.177	0.000	0.981
Elec	0.000	0.012	0.048	0.000	0.470
Constr	0.026	0.047	0.066	0.000	0.441
Trade	0.167	0.198	0.156	0.000	0.696
Transp	0.017	0.037	0.052	0.000	0.297
Bus_Serv	0.055	0.091	0.106	0.000	0.471
Soc_Serv	0.006	0.030	0.101	0.000	0.979
Others	0.334	0.371	0.301	0.001	1.000

Legend: The descriptive statistics shown are expressed in percentage. agri=Loan allocation to agriculture sector. Mining=loan allocation to mining sector. Manuf=Loan allocation to manufacturing sector. Elec=loan allocation to electricity sector. Constr=loan allocation to construction sector. Trade=loan allocation to trade sector. Transp=loan allocation to transportation sector. Bus-serv=loan allocation to business service sector. Soc-serv=loan allocation to social service sector. Others=loan allocation to other (unspecified) sector.

Table 5.7 Univariate Statistics of the Percentage Loan Portfolio Composition for All Banks

Economic Sector	2003-2007		2007-2011		2003-2011	
	z	p-value	z	p-value	z	p-value
Agriculture	1.150	0.250	-0.806	0.420	-0.688	0.492
Mining	-2.548	0.011***	-5.136	0.000***	-5.652	0.000***
Manufacturing	4.444	0.000***	2.822	0.005***	4.406	0.000***
Electricity	0.210	0.833	-5.071	0.000***	-4.719	0.000***
Construction	-1.843	0.065*	0.334	0.738	-1.058	0.290
Trade	-0.500	0.617	1.542	0.123	0.420	0.674
Transportation	0.777	0.437	-3.371	0.001***	-3.048	0.002***
Business Services	-1.977	0.048**	1.900	0.057*	0.203	0.839
Social Services	-0.853	0.393	-2.829	0.005***	-2567	0.010*
Others	-1.356	0.175	-0.334	0.738	-1.365	0.172

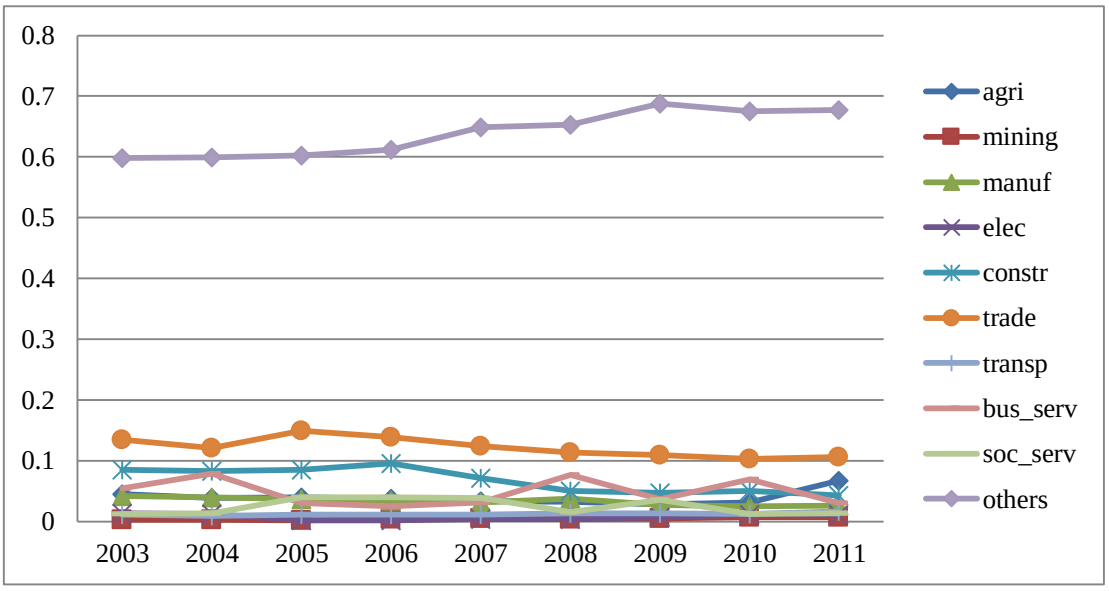
Legend: Wilcoxon-signed rank sum test results for the paired samples of all banks are performed by comparing 2003 with 2007, 2007 with 2011, and 2003 with 2011 since the number of banks in each time period is equal. ***, **, and * respectively correspond to 1%, 5%, and 10% significance levels.

The following sub-sections present the loan portfolio composition of the three bank ownership types in the same three key years (2003, 2007 and 2011).

b) Government-Owned Banks

The mean of loans allocated to each sector is graphically displayed in Figure 5.6. GBs focus on unspecified other sectors (primarily consumers). The loans allocated to this single sector represent more than 50% of their total loans and reflect a general increase from 2003 to 2009 with a slight decrease after that. The other sectors, to which relatively small portions of GB loans are provided, exhibit mixed results. The sector with the highest loan allocation in this regard is the trade sector, with an allocation of less than 15%. This sector shows a decrease in the percentage of loan allocation since 2005. Other sectors, such as the mining sector with an average loan allocation of 1%, remain stable over the 2003-2011 period.

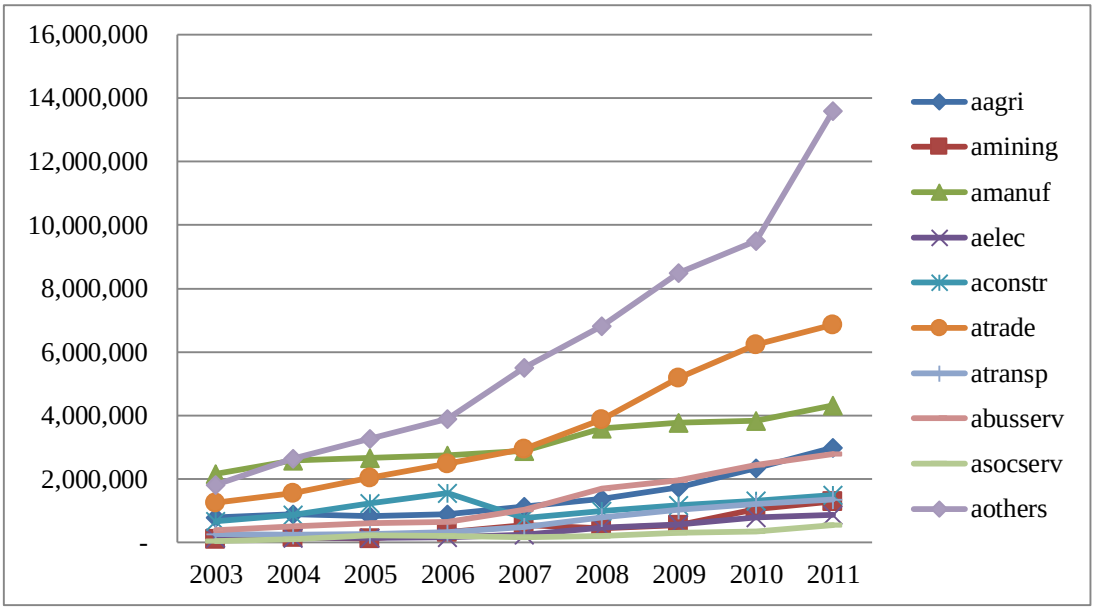
Figure 5.6 Percentage Loan Portfolio Composition of Government-owned Banks Based on Economic Sectors



The actual figures (in IDR) form an upward-sloping trend that differs from the percentage loan allocation depicted in Figure 5.6 because the percentage loan allocation does not represent actual monetary growth. The IDR loan allocation to other (unspecified) sectors in Figure 5.7 exceeds the loan allocation to other sectors; it is similar to the percentage allocation in Figure 5.6. However, the use of IDR

indicates that the monetary values of loans allocated to the trade and manufacturing sectors are clearly greater than those allocated to other sectors. This finding indicates that the monetary values of sectoral loan exposures differ substantially from the percentage differences.

Figure 5.7 Loan Portfolio Composition of Government-owned Banks Based on Economic Sectors (in million IDR)



In addition to the means depicted in Figure 5.6, the information contained in Table 5.8 provides descriptive statistics for the percentage of loans allocated by GBs to different sectors.

Table 5.9 reports the results of the Wilcoxon signed rank sum test, which is used to verify the statistical significance of changes in the percentage of loans allocated to each sector across sub-periods. Based on the table, there are statistically significant increases in loan allocations to the mining and electricity sectors over the periods 2007 to 2011 (p-value $\leq$.01) and 2003 to 2011(p-value $\leq$.01). Loans to the agricultural sector also show a statistically significant increase during the 2003-2007 and 2003-2011 periods. Conversely, there is a statistically significant (p-value $\leq$.01) decrease in loans allocated to the construction sector from 2007 to 2011.

Table 5.8 Descriptive Statistics of the Percentage Loan Portfolio Composition for Government-owned Banks

Variables	2003				
	Median	Mean	Std. Dev.	Min	Max
Agri	0.030	0.045	0.051	0.000	0.195
Mining	0.000	0.003	0.007	0.000	0.033
Manuf	0.007	0.042	0.106	0.001	0.427
Elec	0.000	0.014	0.056	0.000	0.303
Constr	0.029	0.085	0.181	0.008	0.992
Trade	0.103	0.135	0.117	0.000	0.504
Transp	0.004	0.012	0.017	0.000	0.061
Bus_Serv	0.023	0.055	0.100	0.000	0.482
Soc_Serv	0.003	0.012	0.024	0.000	0.115
Others	0.634	0.598	0.268	0.002	0.970
Variables	2007				
	Median	Mean	Std. Dev.	Min	Max
Agri	0.017	0.033	0.038	0.000	0.128
Mining	0.000	0.005	0.016	0.000	0.075
Manuf	0.005	0.031	0.073	0.000	0.292
Elec	0.000	0.004	0.013	0.000	0.053
Constr	0.031	0.072	0.095	0.000	0.394
Trade	0.091	0.124	0.108	0.001	0.443
Transp	0.003	0.011	0.016	0.000	0.058
Bus_Serv	0.014	0.031	0.036	0.000	0.124
Soc_Serv	0.004	0.039	0.134	0.000	0.731
Others	0.753	0.649	0.266	0.099	0.987
Variables	2011				
	Median	Mean	Std. Dev.	Min	Max
Agri	0.030	0.067	0.165	0.000	0.918
Mining	0.001	0.008	0.018	0.000	0.075
Manuf	0.010	0.026	0.049	0.000	0.207
Elec	0.004	0.012	0.015	0.000	0.047
Constr	0.029	0.044	0.045	0.000	0.185
Trade	0.084	0.106	0.080	0.006	0.311
Transp	0.004	0.017	0.031	0.000	0.152
Bus_Serv	0.020	0.030	0.034	0.000	0.127
Soc_Serv	0.007	0.013	0.016	0.000	0.059
Others	0.708	0.677	0.247	0.017	0.982

Legend: The descriptive statistics shown are expressed in percentage. Agri=Loan allocation to agriculture sector. Mining=loan allocation to mining sector. Manuf=Loan allocation to manufacturing sector. Elec=loan allocation to electricity sector. Constr=loan allocation to construction sector. Trade=loan allocation to trade sector. Transp=loan allocation to transportation sector. Bus-Serv=loan allocation to business service sector. Soc-Serv=loan allocation to social service sector. Others=loan allocation to other (unspecified) sector.

Table 5.9 Univariate Statistics of the Percentage Loan Portfolio Composition for Government-owned Banks

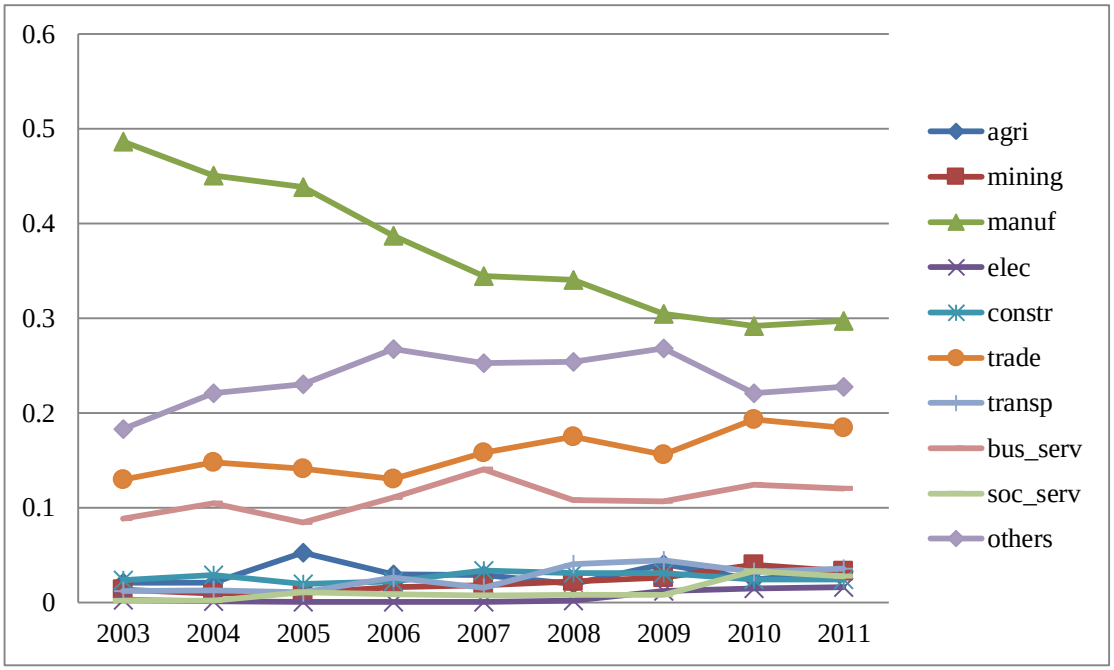
Economic Sector	2003-2007		2007-2011		2003-2011	
	z	p-value	z	p-value	z	p-value
Agriculture	1.769	0.077*	-0.854	0.393	3.692	0.000***
Mining	-0.967	0.334	-3.118	0.002***	-2.604	0.009***
Manufacturing	2.283	0.022**	-0.381	0.704	0.730	0.465
Electricity	0.000	1.000	-3.407	0.001***	-3.045	0.002***
Construction	-1.460	0.144	2.252	0.024***	1.368	0.171
Trade	0.411	0.681	1.450	0.147	1.224	0.221
Transportation	1.020	0.308	-1.244	0.213	-0.792	0.428
Business Services	0.792	0.428	0.041	0.967	0.597	0.551
Social Services	-0.756	0.449	-0.772	0.440	-1.328	0.184
Others	-0.494	0.622	-1.244	0.213	-1.923	0.055*

Legend: Wilcoxon-signed rank sum test results for the paired samples of all banks are performed by comparing 2003 with 2007, 2007 witth 2011, and 2003 with 2011 since the number of banks in each time period is equal. ***, **, and * respectively correspond to 1%, 5%, and 10% significance levels.

c) Foreign-Owned Banks

The loan allocation to each sector in Figure 5.8 indicates that FBs target four sectors: manufacturing, other, trade and business services. The other six sectors receive comparatively small portions of loans relative to the four aforementioned sectors.

Figure 5.8 Percentage Loan Portfolio Composition of Foreign-owned Banks Based on Economic Sectors



FBs are more actively involved in lending to the manufacturing sector relative to other bank ownership types (compare Figures 5.6, 5.8 and 5.10). However, the percentage of loans allocated to the manufacturing sector tends to decline over time (from 49% of total loans in 2003 to 30% in 2011). Conversely, the proportion of loans allocated to unspecified others (primarily consumers) exhibits a slight increase over the full 2003 to 2011 period, with the greatest loan exposure to this sector being observed over the period from 2005 to 2009. The IDR amounts allocated by FBs to unspecified others exceed the IDR amounts FBs have allocated to the manufacturing sector since 2007. In contrast to the percentage of loans allocated, the IDR value of loans allocated to the manufacturing sector increases, whereas it proportionally decreases[43] when considered as a percentage. The reason for this discrepancy is that the percentage exposures of each bank to the various sectors are given equal weighting, whereas the IDR loan exposures of banks to the various sectors are automatically weighted based on the IDR amounts. The larger FBs enter the trade, manufacturing and other (consumer) sectors (as illustrated in Figures 5.8 and 5.9).

[43]This might relate to the fact that loans increase over time in nominal actual figures. However, when measured relative to total loans (in percentage terms), the increase in loans to the manufacturing sector is less than the increase in total loans; hence, the results are contradictory.

Figure 5.9 Loan Portfolio Composition of Foreign-owned Banks Based on Economic Sectors (in million IDR)

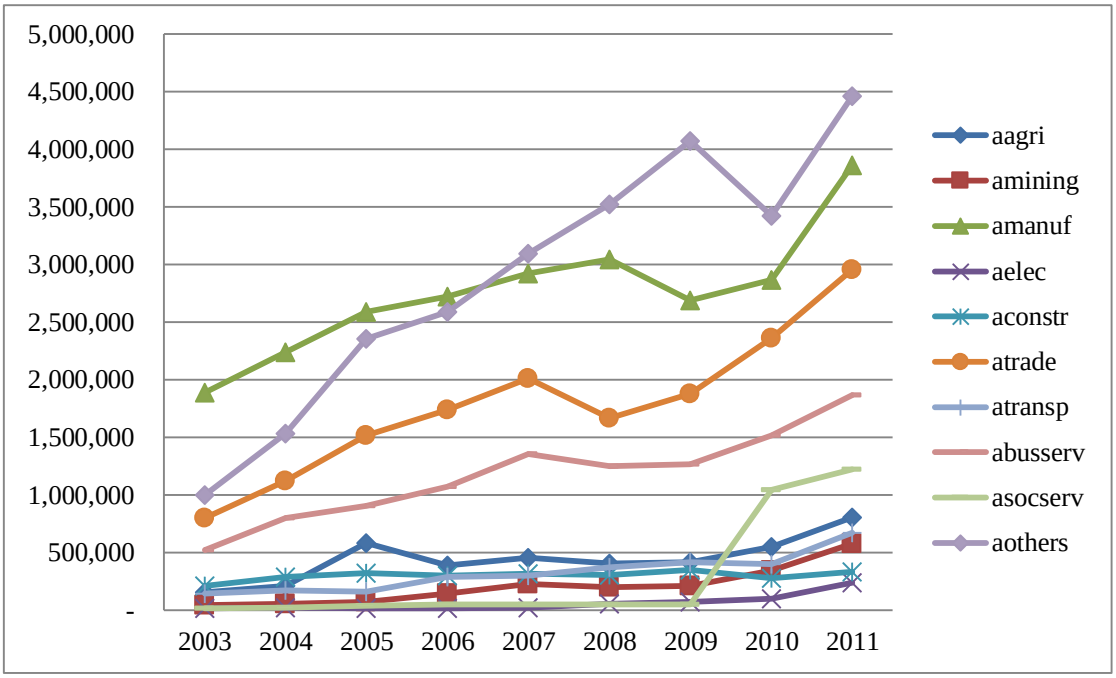


Table 5.10 contains the descriptive percentage sectoral loan allocation statistics for FBs in addition to the means depicted in Figure 5.8.

The Mann-Whitney test (Table 5.11) shows that the decrease in loan allocation by FBs to the manufacturing sector over the 2003 to 2011 period is statistically significant (p-value ≤.01). In addition to this significant change in loan allocation to the manufacturing sector, there are statistically significant (p-value ≤.05) increases in loans allocated to the mining, trade and transportation sectors for the period 2003-2011. Although not significantly different for the full research period, loans to the electricity sector also exhibit a significant (p-value ≤.1) increase during the 2007-2011 period.

Table 5.10 Descriptive Statistics of the Percentage Loan Portfolio Composition for Foreign-owned Banks

Variable	2003				
	Median	Mean	Std. Dev.	Min	Max
Agri	0	0.021	0.036	0	0.132
Mining	0	0.014	0.047	0	0.240
Manuf	0.455	0.487	0.273	0	0.978
Elec	0	0.003	0.007	0	0.027
Constr	0.003	0.024	0.051	0	0.248
Trade	0.047	0.130	0.204	0	1
Transp	0	0.012	0.023	0	0.081
Bus_serv	0.078	0.088	0.085	0	0.240
Soc_serv	0	0.002	0.005	0	0.022
Others	0.146	0.183	0.187	0	0.639
Variable	2007				
	Median	Mean	Std. Dev.	Min	Max
Agri	0.009	0.029	0.053	0	0.266
Mining	0	0.018	0.037	0	0.149
Manuf	0.261	0.345	0.243	0	0.937
Elec	0	0.001	0.002	0	0.011
Constr	0.009	0.033	0.076	0	0.405
Trade	0.126	0.158	0.142	0	0.576
Transp	0.008	0.015	0.021	0	0.082
Bus_serv	0.107	0.141	0.143	0	0.530
Soc_serv	0	0.007	0.017	0	0.080
Others	0.191	0.253	0.231	0	0.720
Variable	2007				
	Median	Mean	Std. Dev.	Min	Max
Agri	0.012	0.033	0.054	0	0.271
Mining	0.018	0.033	0.043	0	0.197
Manuf	0.265	0.298	0.217	0	0.981
Elec	0	0.016	0.077	0	0.470
Constr	0.011	0.024	0.037	0	0.185
Trade	0.158	0.185	0.138	0	0.506
Transp	0.023	0.036	0.045	0	0.242
Bus_serv	0.09	0.120	0.125	0	0.471
Soc_serv	0	0.028	0.067	0	0.361
Others	0.147	0.228	0.234	0	1

Legend: The descriptive statistics shown are expressed in percentage. Agri=Loan allocation to agriculture sector. Mining=loan allocation to mining sector. Manuf=Loan allocation to manufacturing sector. Elec=loan allocation to electricity sector. Constr=loan allocation to construction sector. Trade=loan allocation to trade sector. Transp=loan allocation to transportation sector. Bus-Serv=loan allocation to business service sector. Soc-Serv=loan allocation to social service sector. Others=loan allocation to other (unspecified) sector.

Table 5.11 Univariate Statistics of the Loan Portfolio Composition for Foreign-owned Banks

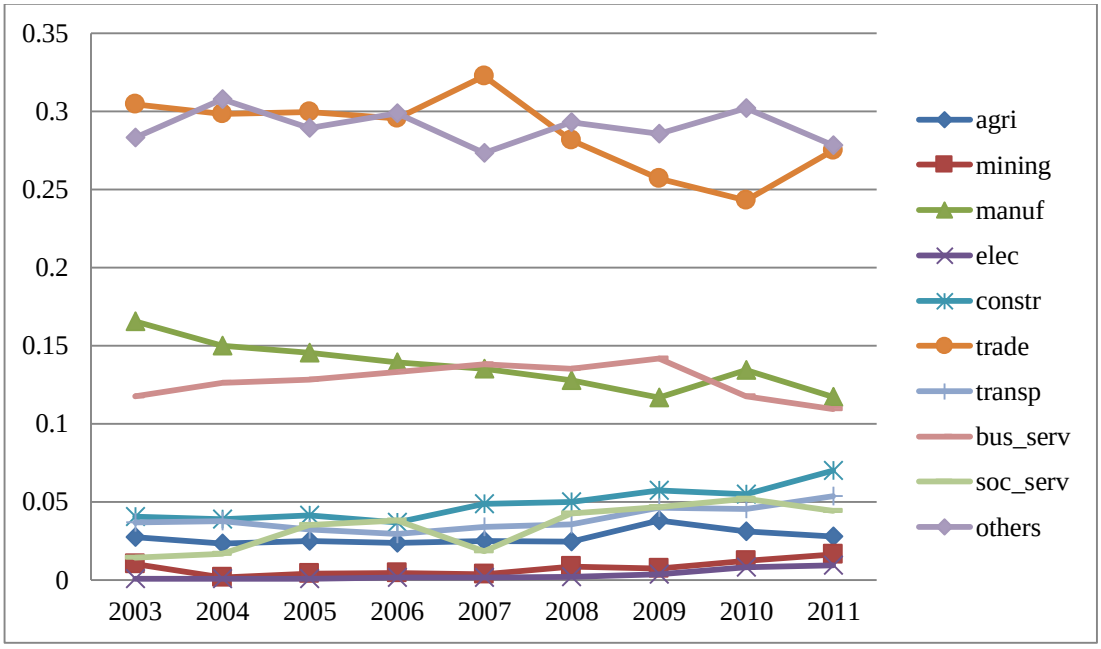
Economic Sector	2003-2007		2007-2011		2003-2011	
	z	p-value	z	p-value	z	p-value
Agriculture	0.882	0.378	0.404	0.686	1.307	0.191
Mining	0.497	0.619	1.958	0.050*	2.542	0.011**
Manufacturing	-2.236	0.025**	-0.670	0.503	-3.011	0.003***
Electricity	-0.489	0.625	1.720	0.086*	1.052	0.293
Construction	0.532	0.595	0.104	0.917	0.633	0.527
Trade	1.556	0.120	1.031	0.302	2.415	0.016**
Transportation	1.616	0.106	2.233	0.026**	3.074	0.002**
Business Services	1.054	0.292	-0.592	0.554	1.063	0.288
Social Services	0.701	0.483	0.812	0.417	1.332	0.183
Others	1.200	0.230	-0.479	0.632	0.809	0.373

Legend: Mann-Whitney test for the non-paired samples of foreign banks are performed by comparing 2003 with 2007, 2007 with 2011, and 2003 with 2011 since the number of banks in each time period is not equal. ***, **, and * respectively correspond to 1%, 5%, and 10% significance levels.

d) Domestic-Owned Banks

Figure 5.10 depicts the loan portfolio composition of DBs. The four major sectors of focus are trade, others, manufacturing and business services. Each of the other six sectors accounts for less than 7.5% of loan allocation.

Figure 5.10 Percentage Loan Portfolio Composition of Domestic-owned Banks Based on Economic Sectors



DBs are major players in the trade and unspecified other (primarily consumer) sectors; on average, DBs allocate one-third of their loans to these two sectors. In 2007, the percentage loan allocation to trade was proportionally higher than the loan allocation to the unspecified other sectors. However, the IDR amounts of loans to the unspecified other sectors increased substantially after 2007, followed by loans to the trade sector (Figure 5.11). This finding indicates that the larger domestic banks in particular appear to increase their exposures to the unspecified other sectors.

Figure 5.11 Loan Portfolio Composition of Domestic-owned Banks Based on Economic Sectors (in million IDR)

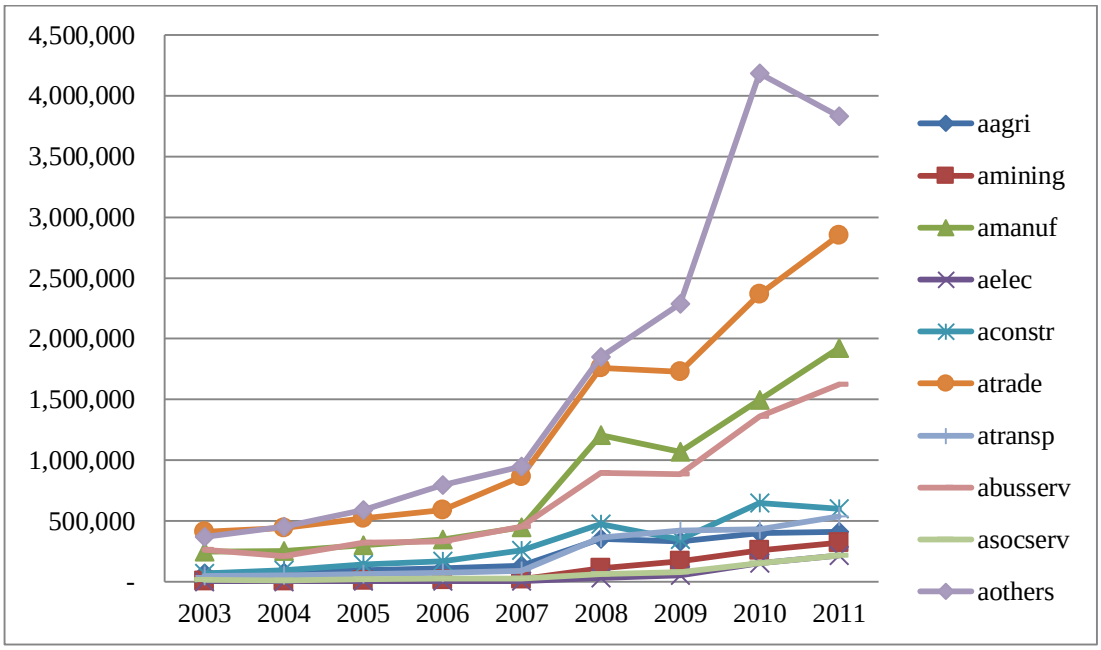


Table 5.12 contains descriptive statistics for the percentage of loans allocated by DBs to the different sectors in addition to the means reflected in Figure 5.10.

The Mann-Whitney test (Table 5.13) indicates that the loan allocation to the manufacturing sector decreases significantly (p-value ≤.1) over the 2003-2011 period. Furthermore, there are statistically significant (p-value ≤.05) increases in loans allocated to the mining and electricity sectors for the periods from 2007 to 2011 and 2003 to 2011. Loans to the construction and social services sectors also exhibit statistically significant (p-value ≤ .1) increases during the 2003 to 2011 period.

Table 5.12 Descriptive Statistics of the Percentage Loan Portfolio Composition of Domestic-owned Banks

Variable	2003				
	Median	Mean	Std. Dev.	Min	Max
Agri	0.005	0.027	0.075	0	0.496
Mining	0	0.010	0.049	0	0.346
Manuf	0.144	0.166	0.122	0	0.609
Elec	0	0.001	0.002	0	0.015
Constr	0.017	0.041	0.056	0	0.303
Trade	0.326	0.305	0.194	0	0.722
Transp	0.025	0.037	0.049	0	0.224
Bus_Serv	0.081	0.118	0.118	0	0.459
Soc_Serv	0.002	0.014	0.031	0	0.182
Others	0.193	0.283	0.254	0	0.998
Variable	2007				
	Median	Mean	Std. Dev.	Min	Max
Agri	0.005	0.025	0.067	0	0.429
Mining	0	0.004	0.010	0	0.041
Manuf	0.124	0.135	0.078	0	0.312
Elec	0	0.001	0.005	0	0.020
Constr	0.034	0.049	0.067	0	0.361
Trade	0.295	0.323	0.164	0	0.716
Transp	0.018	0.034	0.050	0	0.250
Bus_Serv	0.129	0.138	0.111	0	0.441
Soc_Serv	0.004	0.018	0.031	0	0.150
Others	0.188	0.273	0.238	0	0.997
Variable	2011				
	Median	Mean	Std. Dev.	Min	Max
Agri	0.007	0.028	0.059	0	0.315
Mining	0.003	0.016	0.025	0	0.121
Manuf	0.102	0.117	0.090	0	0.427
Elec	0	0.009	0.028	0	0.131
Constr	0.038	0.070	0.088	0	0.441
Trade	0.247	0.275	0.175	0	0.696
Transp	0.036	0.053	0.063	0	0.297
Bus_Serv	0.080	0.109	0.107	0	0.465
Soc_Serv	0.012	0.044	0.150	0	0.979
Others	0.259	0.278	0.226	0	0.828

Legend: The descriptive statistics shown are expressed in percentage. Agri=Loan allocation to agriculture sector. Mining=loan allocation to mining sector. Manuf=Loan allocation to manufacturing sector. Elec=loan allocation to electricity sector. Constr=loan allocation to construction sector. Trade=loan allocation to trade sector. Transp=loan allocation to transportation sector. Bus-Serv=loan allocation to business service sector. Soc-Serv=loan allocation to social service sector. Others=loan allocation to other (unspecified) sector.

Table 5.13 Univariate Statistics of the Percentage Loan Portfolio Composition for Domestic-owned Banks

Economic Sector	2003-2007		2007-2011		2003-2011	
	z	p-value	z	p-value	z	p-value
Agriculture	0.231	0.818	0.487	0.626	0.600	0.549
Mining	0.868	0.385	2.550	0.011**	3.201	0.001***
Manufacturing	-0.978	0.381	-1.279	0.201	-1.943	0.052*
Electricity	0.000	1.000	2.179	0.029**	2.454	0.014**
Construction	0.391	0.696	1.392	0.164	1.945	0.052*
Trade	0.169	0.866	-1.382	0.167	-0.821	0.411
Transportation	-0.443	0.658	1.551	0.121	1.190	0.234
Business Services	1.303	0.193	-1.315	0.189	-0.145	0.885
Social Services	0.700	0.484	1.134	0.257	1.960	0.050**
Others	0.096	0.924	0.035	0.972	0.122	0.903

Legend: Mann-Whitney tests for the non-paired samples of DBs banks are performed by comparing 2003 with 2007, 2007 with 2011, and 2003 with 2011 since the number of banks in each time period is not equal. ***, **, and * respectively correspond to 1%, 5%, and 10% significance levels.

In summary, the loan portfolio compositions of GBs, FBs, and DBs differ significantly. GBs focus on other (unspecified) sectors, FBs focus on the manufacturing sector and DBs focus on the trade sector. However, the difference appears to decline over time.

Table 5.14 summarises the results of the univariate analyses performed for the sectoral loan portfolio composition of the banks. The Wilcoxon signed rank test and the Mann-Whitney test indicate that loans allocated to the mining and electricity sectors by all bank ownership types increased significantly during the 2007 to 2011 and 2003 to 2011 periods, whereas loans allocated to the manufacturing sector by FBs and DBs decreased significantly over the 2003 to 2011 period.

Table 5.14 Univariate Statistics Summary of Loan Portfolio Composition Based on Economic Sector Over Time

Sector	2003-2007				2007-2011				2003-2011			
	All	GB	FB	DB	All	GB	FB	DB	All	GB	FB	DB
Agri	NS	-S	NS	NS	NS	NS	NS	NS	NS	+S	NS	NS
Mine	-S	NS	NS	NS	+S	+S	+S	+S	+S	+S	+S	+S
Manu	-S	-S	-S	NS	-S	NS	NS	NS	-S	NS	-S	-S
Elec	NS	NS	NS	NS	+S	+S	+S	+S	+S	-S	NS	+S
Cstr	+S	NS	NS	NS	NS	-S	NS	NS	NS	NS	NS	+S
Trad	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	+S	NS
Trsp	NS	NS	NS	NS	+S	NS	+S	NS	+S	NS	+S	NS
Bsrv	+S	NS	NS	NS	-S	NS	NS	NS	NS	NS	NS	NS
Ssrv	NS	NS	NS	NS	+S	NS	NS	NS	+S	NS	NS	+S
Othr	NS	NS	NS	NS	NS	NS	NS	NS	NS	+S	NS	NS

NS : Not Significant; +S : Significant Increase; -S : Significant Decrease

Comparing the sector loan portfolio composition with the sector concentration (as measured by EHHI), the more focused loan portfolio composition applied by GBs is essentially dominated by two major sectors, unspecified (other) and trade, whereas the more diversified loan portfolios of FBs and DBs are spread over the following four major sectors: trade, others, manufacturing and business services.

5.2.3.2 Based on Loan Types

The findings regarding the allocation of loans according to different loan types (working capital, investments, and consumption) are discussed in the sections below.

a) All Banks

Table 5.15 contains the descriptive loan type portfolio composition statistics for all banks.

Table 5.15 Descriptive Statistics of the Percentage Loan Type Portfolio Composition for All Banks

Variable	2003				
	Median	Mean	Std. Dev.	Min	Max
WC	0.554	0.528	0.305	0.000	1.000
Invt	0.1	0.156	0.180	0.000	0.921
Consumt	0.207	0.308	0.298	0.000	0.995
Variable	2007				
	Median	Mean	Std. Dev.	Min	Max
WC	0.563	.524	.304	0	.999
Invt	0.099	.150	.189	0	.998
Consumt	0.197	.326	.314	0	1
Variable	2011				
	Median	Mean	Std. Dev.	Min	Max
WC	0.495	0.477	0.291	0.000	0.998
Invt	0.177	0.194	0.168	0.000	0.996
Consumt	0.254	0.329	0.314	0.000	1.000

Legend: The descriptive statistics shown are expressed in percentage. WC=Loan allocation to working capital. Invt=loan allocation to investment. Consumt=Loan allocation to consumption.

The means of the percentages of loans allocated to investment and consumption loans for all banks increase from 2003 to 2011, but only the increase in investment loans is statistically significant (p-value $\leq .01$) for the 2007 to 2011 and 2003 to 2011 periods. However, the percentage of working capital loans decreases significantly (p-value $\leq .01$) over the 2007 to 2011 and 2003 to 2011 periods (Table 5.16).

Table 5.16 Univariate Statistics of the Percentage Loan Types Portfolio Composition for All Banks

Loan Types	2003-2007		2007-2011		2003-2011	
	z	p-value	z	p-value	z	p-value
Working Capital	0.086	0.931	3.930	0.000***	3.022	0.003***
Investment	0.251	0.802	-4.157	0.000***	-2.906	0.004***
Consumption	-1.032	0.302	-0.340	0.734	-0.866	0.386

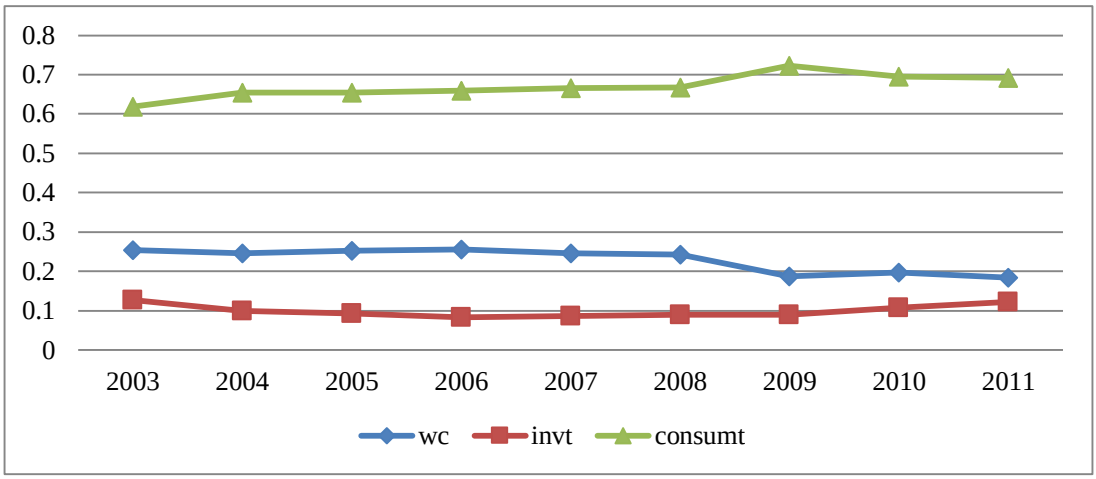
Legend: Wilcoxon-signed rank sum tests for the paired samples of all banks are performed by comparing 2003 with 2007, 2007 with 2011, and 2003 with 2011 since the number of banks in each time period is equal. ***, **, and * respectively correspond to 1%, 5%, and 10% significance levels.

b) Government-Owned Banks

The means of the percentage of loan types allocated by GBs are graphically displayed in Figure 5.12. Consumption loans represent the majority of GB loans, with only a very small portion of loans allocated to working capital and investments.

These figures, combined with the prominent consumer sector exposure reported in Figures 5.6 and 5.7, do not support the findings of previous studies such as Mian (2003), highlighting the role of GBs in financing or subsidising social projects.

Figure 5.12 Loan Portfolio Composition of Government-owned Banks Based on Loan Types



However, when expressed in IDR, working capital is the most prominent type of finance. Similar to the size difference implications of GBs identified in Figures 5.6 and 5.7, it is evident that the larger GBs focus more on working capital financing than the smaller GBs do when the information reflected in Figure 5.13 is compared to that in Figure 5.12. This finding suggests that regional development banks (small in size) and state-owned banks (large in size) differ in their market segment focus and in the product types related to such segments (Atahau and Cronje, 2014).

Figure 5.13 Loan Portfolio Composition of Government-owned Banks Based on Loan Types (in million IDR)

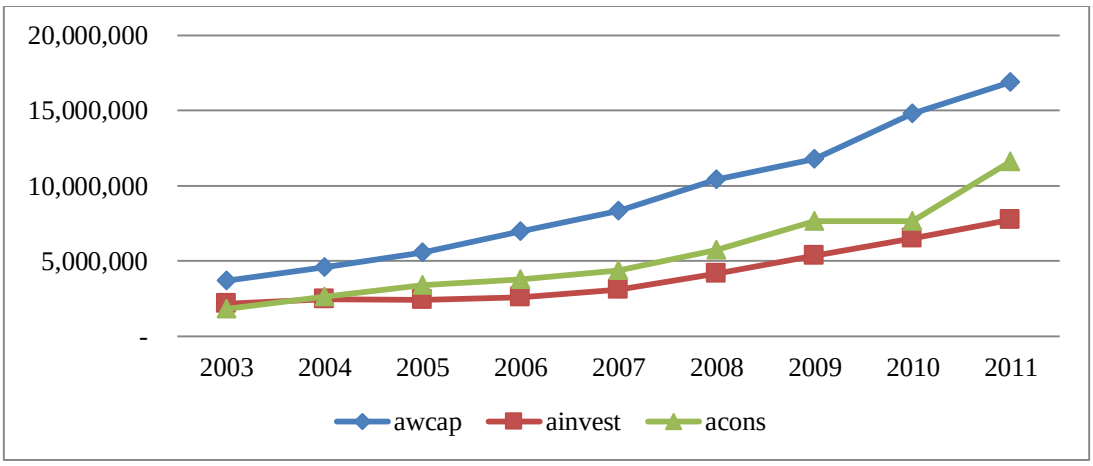


Table 5.17 indicates that the means of the percentages of working capital financing and investment financing decrease from 2003 to 2011. GBs tend to focus on consumption financing and increase their exposure to this type of loans over time.

Table 5.17 Descriptive Statistics of the Percentage Loan Types Portfolio Composition for Government-owned Banks

Variables	2003				
	Median	Mean	Std. Dev.	Min	Max
WC	0.196	0.254	0.192	0.042	0.685
Invt	0.078	0.127	0.139	0.004	0.506
Consumt	0.621	0.619	0.266	0.059	0.952
Variables	2007				
	Median	Mean	Std. Dev.	Min	Max
WC	0.173	0.246	0.192	0.020	0.711
Invt	0.073	0.087	0.090	0.003	0.318
Consumt	0.764	0.667	0.263	0.099	0.976
Variables	2011				
	Median	Mean	Std. Dev.	Min	Max
WC	0.141	0.185	0.157	0.005	0.689
Invt	0.094	0.123	0.123	0.005	0.483
Consumt	0.718	0.692	0.236	0.196	0.989

Legend: The descriptive statistics shown are expressed in percentage. WC=Loan allocation to working capital. Invt=loan allocation to investment. Consumt=Loan allocation to consumption.

The decrease in the percentage of working capital financing is statistically significant (p-value $\leq$.01) for both the 2007 to 2011 and 2003 to 2011 periods, whereas the increase in the percentage of consumption financing is significant (p-value $\leq$.1) for the 2003 to 2011 period (Table 5.18).

Table 5.18 Univariate Statistics of the Percentage Loan Types Portfolio Composition for Government-owned Banks

Loan Types	**2003-2007**		**2007-2011**		**2003-2011**	
	z	p-value	z	p-value	z	p-value
Working Capital	-1.142	0.254	3.281	0.001***	2.993	0.003***
Investment	1.635	0.102	-2.478	0.013**	-0.195	0.845
Consumption	-0.668	0.504	-1.491	0.136	-1.697	0.090*

Legend: Wilcoxon-signed rank sum tests for the paired samples of GBs are performed by comparing 2003 with 2007, 2007 with 2011, and 2003 with 2011 since the number of banks in each time period is equal. ***, **, and * respectively correspond to 1%, 5%, and 10% significance levels.

c) Foreign-Owned Banks

In contrast to GBs, FBs focus on working capital financing. The loans allocated to working capital represent a high percentage (69% in 2003 and 66% in 2011) of their total loans. Because FBs are the major providers of loans to the manufacturing, trade and other sectors (refer to Figures 5.8 and 5.9), the high percentage of working capital loans in Figure 5.14 demonstrates that short-term financing to the manufacturing and trade sectors is their most common form of financing. This finding is also supported by the increase in working capital loans measured in IDR (Figure 5.14) compared to that of long-term (investments) and consumption financing.

Figure 5.14 Percentage Loan Portfolio Composition of Foreign-owned Banks Based on Loan Types

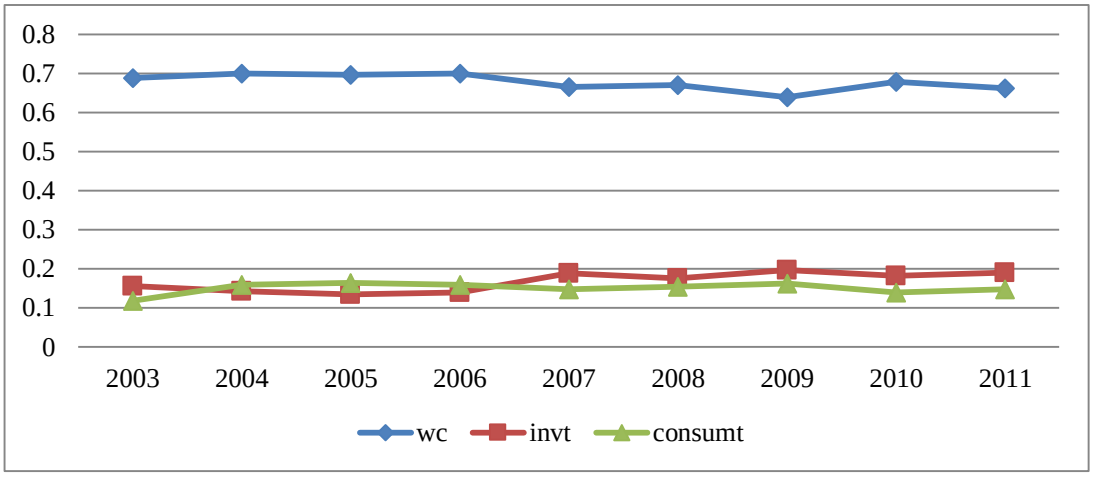


Figure 5.15 Loan Portfolio Composition of Foreign-owned Banks Based on Loan Types (in million IDR)

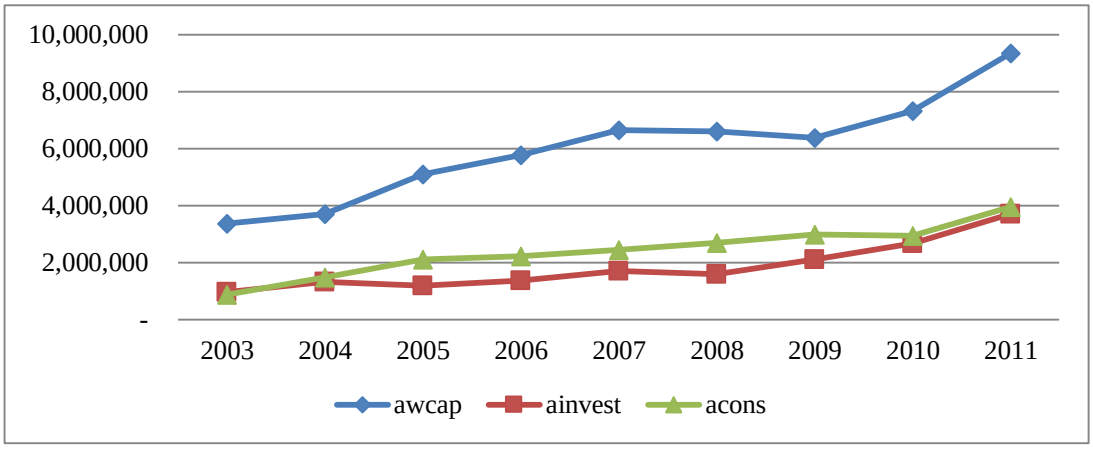


Table 5.19 shows that the means of the percentages of amounts allocated to investment and consumption loans by FBs increase from 2003 to 2011. However, the working capital loan allocation decreases over this period. Comparing the actual downward trend in the working capital loan allocation with the IDR increase in Figure 5.15, it is evident that larger FBs tend to provide more working capital loans than smaller FBs; therefore, the changes are not statistically significant (Table 5.20). The changes in investment and consumption loan allocations are also not significant with respect to the Mann-Whitney test results.

Table 5.19 Descriptive Statistics of the Percentage Loan Types Portfolio Composition for Foreign-owned Banks

Variable	2003				
	Median	Mean	Std. Dev.	Min	Max
WC	0.754	0.688	0.277	0	1
Invt	0.062	0.156	0.210	0	0.873
Consumt	0.013	0.119	0.158	0	0.604
Variable	2007				
	Median	Mean	Std. Dev.	Min	Max
WC	0.781	0.665	0.277	0	0.988
Invt	0.099	0.188	0.266	0	0.998
Consumt	0.071	0.147	0.178	0	0.633
Variable	2011				
	Median	Mean	Std. Dev.	Min	Max
WC	0.677	0.662	0.262	0	0.998
Invt	0.196	0.190	0.187	0	0.996
Consumt	0.050	0.148	0.215	0	1

Legend: The descriptive statistics shown are expressed in percentage. WC=Loan allocation to working capital. Invt=loan allocation to investment. Consumt=Loan allocation to consumption.

Table 5.20 Univariate Statistics of the Percentage Loan Types Portfolio Composition for Foreign-owned Banks

Loan Types	2003-2007		2007-2011		2003-2011	
	z	p-value	Z	p-value	z	p-value
Working Capital	-0.298	0.766	-0.163	0.870	-0.591	0.554
Investment	0.698	0.485	1.079	0.281	1.184	0.237
Consumption	0.646	0.518	-0.141	0.888	0.605	0.545

Legend: Mann-Whitney tests for the non-paired samples of foreign banks are performed by comparing 2003 with 2007, 2007 with 2011, and 2003 with 2011 since the number of banks in each time period is not equal. ***, **, and * respectively correspond to 1%, 5%, and 10% significance levels.

d) Domestic-Owned Banks

Working capital loans constitute the majority of DB loans (similar to FBs), but the percentage of these loans decreases from 60% in 2003 to 55% in 2004, after which it increases again to 60% in 2007. However, after 2007, the percentage continues to decrease to 52% in 2011. This overall decline in the portion of DB working capital loans exceeds that of FBs, which only declines from 69% in 2003 to 66% in 2011 (Figures 5.14 and 5.16). However, the investment financing (longer- term loans) of DBs increases from 17% in 2003 to 23% in 2011. As the major providers of funds to the trade, hotel, and restaurant sectors (refer to Figure 5.10), DBs' short-term working capital loans to these sectors are decreasing whereas their long-term loans to these sectors are increasing. However, considering the IDR amounts allocated to the different loan types (Figure 5.17), it is evident that since 2007, larger DBs have increased their exposure to consumption financing to a greater extent than smaller DBs and have provided more investment financing than the smaller DBs.

Figure 5.16 Percentage Loan Portfolio Composition of Domestic-owned Banks Based on Loan Types

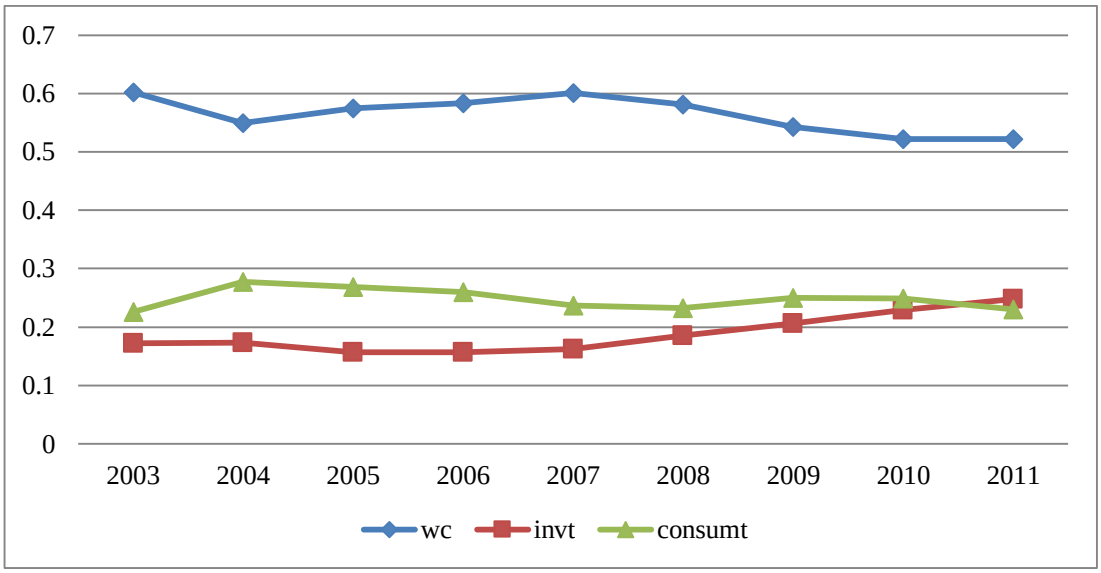


Figure 5.17 Loan Portfolio Composition of Domestic-owned Banks Based on Loan Types (in million IDR)

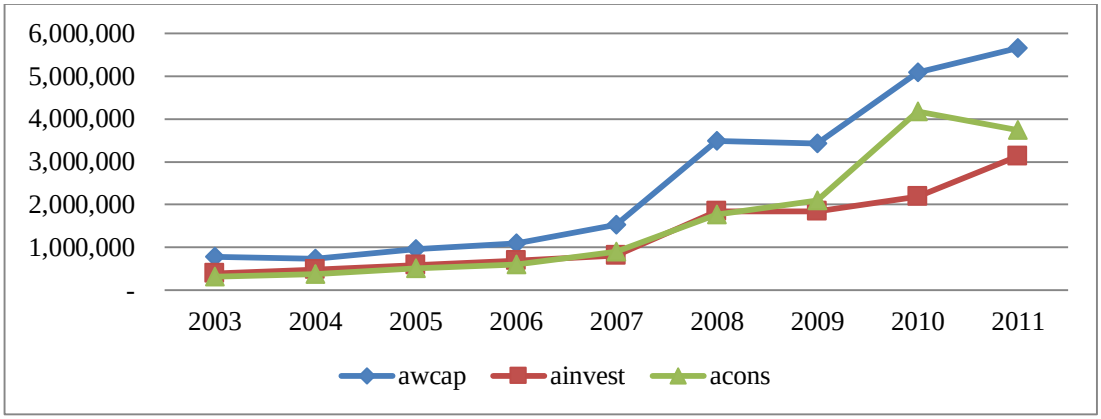


Table 5.21 provides descriptive statistics for the loan type portfolio composition of DBs reflected in Figure 5.16.

The application of the Mann-Whitney test (Table 5.22) indicates that the decrease in the percentage of working capital financing is significant for the 2007 to 2011 period (p-value ≤ .05). It also indicates that the increase in the percentage of investment financing by DBs is statistically significant for both the 2007 to 2011(p-value ≤ .01) and 2003 to 2011(p-value ≤ .01) periods. The percentage of consumption financing increases slightly from 2003 to 2011 but is not statistically significant.

Table 5.21 Descriptive Statistics of the Percentage Loan Types Portfolio Composition of Domestic-owned Banks

Variable	2003				
	Median	Mean	Std. Dev.	Min	Max
WC	0.622	0.602	0.272	0.003	0.999
Invt	0.140	0.172	0.185	0	0.921
Consumt	0.140	0.226	0.230	0.001	0.995
Variable	2007				
	Median	Mean	Std. Dev.	Min	Max
WC	0.705	0.601	0.267	0	0.999
Invt	0.137	0.162	0.157	0	0.691
Consumt	0.149	0.237	0.245	0	1
Variable	2011				
	Median	Mean	Std. Dev.	Min	Max
WC	0.569	0.522	0.222	0.045	0.978
Invt	0.228	0.248	0.162	0	0.732
Consumt	0.128	0.230	0.207	0.008	0.804

Legend: The descriptive statistics shown are expressed in percentage. WC=Loan allocation to working capital. Invt=loan allocation to investment. Consumt=Loan allocation to consumption

Table 5.22 Univariate Statistics of the Percentage Loan Types Portfolio Composition of Domestic-owned Banks

Loan Types	2003-2007		2007-2011		2003-2011	
	z	p-value	Z	p-value	z	p-value
Working Capital	0.066	0.947	-2.004	0.045**	-1.643	0.100
Investment	-0.228	0.820	2.640	0.008***	2.685	0.007***
Consumption	0.426	0.670	0.095	0.924	0.487	0.627

Legend: Mann-Whitney tests for the non-paired samples of DBs are performed by comparing 2003 with 2007, 2007 with 2011, and 2003 with 2011 since the number of banks in each time period is not equal. ***, **, and * respectively correspond to 1%, 5%, and 10% significance levels

In summary, the loan type portfolio composition of GBs differs extensively from that of FBs and DBs. GBs primarily focus on consumption loans, and a significant increase in these loans (from 61% to 69%) is evident over the 2003 to 2011 period (Table 5.17). Other loan types, such as investment and working capital loans, constitute less than 40% of GB loans and exhibit significant decreases over the 2003 to 2007 and 2007 to 2011 periods (Table 5.18). Thus, GBs are more active in the retail segment and focus on consumption finance.

FBs and DBs have similarities in their loan type compositions; for example, working capital loans represent the majority of the loans issued by both bank types (Figures 5.14 and 5.16). However, the percentage of working capital loans issued by FBs exceeds that of DBs in all years, although it declined by 3% from 2003 to 2011. This change is not significant according to the Mann-Whitney test (Table 5.20). However, the working capital loans of DBs decreased by 5% over the 2003 to 2011 period, with an increase in investment loans of 6%. Both of these changes are significant over the 2007-2011 period according to the Mann-Whitney test (Table 5.22). Therefore, it is evident that FB loan exposures are primarily short term and targeted at corporations. However, DBs, which also focus on short-term loans to corporations, are more diversified than FBs because of the former's lower concentration in individual loan types and are diversifying their financing to long-term investment loans by replacing working capital loans to a certain extent.

Table 5.23 summarises the univariate analysis conducted for loan portfolio composition based on loan types. As indicated in the table, the loan portfolio

composition based on loan types does not change significantly during the 2003-2007 period. Changes in loan portfolio composition began during the post-GFC period of 2007 to 2011, particularly for the working capital and investment loan types.

Table 5.23 Univariate Statistics Summary of Loan Portfolio Composition Based on Loan Type Percentages Over Time

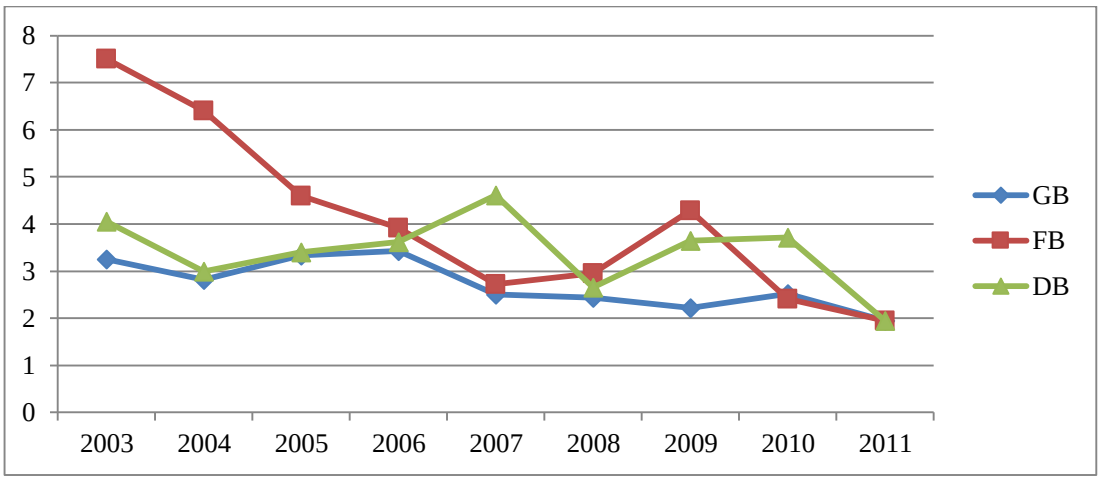
Types	2003-2007				2007-2011				2003-2011			
	All	GB	FB	DB	All	GB	FB	DB	All	GB	FB	DB
WC	NS	NS	NS	NS	-S***	-S***	NS	-S**	-S***	-S***	NS	NS
Invt	NS	NS	NS	NS	+S***	+S**	NS	+S***	+S***	NS	NS	+S***
Csmt	NS	NS	NS	NS	NS	NS	NS	NS	NS	+S*	NS	NS

NS : Not Significant
+S : Significant Increase
-S : Significant Decrease

5.2.4 Loan Portfolio Risks

The annual aggregate NPL to total loan ratios for GBs, FBs and DBs are depicted in Figure 5.18. These values are based on the average NPLs of the individual banks for each of the ownership types.

Figure 5.18 Gross NPL Ratios of Government-, Foreign-, Domestic-owned Banks



The NPLs of the GBs, FBs and DBs differ to the greatest extent in 2003, although the differences decrease with minor NPL differences remaining in 2011 (Figure 5.18). FBs report the highest gross NPL ratio in 2003, but the ratio decreases to

levels below that of DBs in 2007. Thereafter, the NPL volatility of FBs increases in 2008 and 2009 (likely because of the GFC), followed by decreases in 2010 and 2011 to the lowest NPL levels. The NPLs of FBs declined by 5.562% over the 2003 to 2011 period (Table 5.24). DBs also exhibited a decrease of 2.113% over the full study period, with a larger decrease between 2007 and 2011 compared to the 2003 to 2007 period. The NPL levels of GBs are lower than those of FBs and DBs from 2003 to 2010 and exhibit very little volatility compared to FBs and DBs. The NPLs of the FBs and DBs only decreased to the same levels as those experienced by GBs in 2011. As shown in Table 5.24, the combined NPLs of all banks decreased from 4.692% in 2003 to 1.947% in 2011. This statistic indicates that overall bank credit risk decreased and the quality of loan portfolios improved over the nine-year study period. In essence, this finding indicates that banks may have adjusted their credit risk assessment and/or qualifying criteria for loans. Bank Indonesia Regulation PBI 2/11/PBI/2000 jo PBI 15/2/PBI/2013, which implemented a 5% maximum threshold for the net NPL ratio, may be one of the causes of such adjustments (Bank Indonesia, 2013a).

The decrease in the overall NPLs of Indonesian banks may also result from the prudential regulations enacted by Bank Indonesia since 2003 (Indonesian banking booklet, 2003 and 2011):

- Productive asset quality: PBI 7/2/PBI/2005 jo 8/2/PBI/2006 jo PBI 9/6/PBI/2007 jo PBI 11/2/PBI/2009 (Bank Indonesia, 2009b)
- Loan-loss provision: PBI 7/2/PBI/2005 jo PBI 8/2/PBI/2006 jo PBI 11/2/PBI/2009[44] (Bank Indonesia, 2009b)
- Loan Restructuring: PBI No 7/2/PBI/2005 (Bank Indonesia, 2005a)

However, this decline may also have been affected by external economic factors not researched in this study.

[44] The general provision is established at one % of the current liquid assets and the special provision varies according to loan collectability: five % for the special mention category, 15 % for the sub-standard category, 50 % for the doubtful category and, finally, 100 % for the loss category. The calculation must be performed by first deducting the realisable collateral value from the asset under provision in any of the aforementioned categories of collectability (see Section 3.3.4.4).

Regarding the statistical significance of the NPL changes contained in Table 5.25, an analysis suggests statistically significant (p-value ≤ .01, .05 and .1) changes in the NPL for the full study period (2003-2011), for the majority of the sub-periods for all banks and for each of the GB, FB and DB ownership types. The only periods for which the results are not statistically significant are 2007 to 2011 for FBs and 2003 to 2007 for DBs. However, the Kruskal-Wallis test indicates no statistical significance in the NPL differences across bank ownership types (GBs, FBs, and DBs) in 2003, 2007 and 2011. This result may have occurred because the NPLs of the individual banks that represent the various ownership types are highly dispersed and take overlapping values (Panel E, Table 5.25).

Table 5.24 Descriptive Statistics of the Loan Portfolio Risk for Different Bank Ownership Types

	2003	2007	2011
Panel A: All banks			
Mean	4.692	3.429	1.947
Std. Dev.	6.282	6.391	1.690
Minimum	0	0	0
Maximum	41.1	63	9
Kurtosis	15.410	70.756	6.728
Skewness	3.191	7.631	1.710
Panel B: Government-Owned Banks			
Mean	3.252	2.503	1.946
Std. Dev.	3.137	2.427	1.425
Minimum	0.23	0	0.15
Maximum	15.74	10.11	7.44
Kurtosis	9.537	5.284	8.332
Skewness	2.321	1.624	1.909
Panel C: Foreign-Owned Banks			
Mean	7.511	2.726	1.949
Std. Dev.	9.859	2.593	1.774
Minimum	0	0	0
Maximum	41.1	9	7.87
Kurtosis	7.086	3.104	5.280
Skewness	2.160	1.055	1.442

Table 5.24 Descriptive Statistics of the Loan Portfolio Risk for Different Bank Ownership Types (continued)

	2003	2007	2011
Panel D: Domestic-Owned Banks			
Mean	4.058	4.618	1.945
Std. Dev.	4.752	9.531	1.824
Minimum	0	0	0
Maximum	22.29	63	9
Kurtosis	7.167	33.559	6.961
Skewness	2.163	5.429	1.809

Legend: The descriptive statistics shown in Panel A-D are expressed in percentage. NPL=Loan Portfolio repayment default risk.

Table 5.25 Univariate Statistics of the Loan Portfolio Risk for Different Bank Ownership Types

	2003-2007	2007-2011	2003-2011
Panel A: All banks			
Mean Difference	-1.263	-1.482	-2.745
Z	2.754	4.146	4.992
Prob> z	0.0059***	0.000***	0.000***
No. of Observation	109	109	109
Panel B: Government-Owned Banks			
Mean Difference	-0.749	-0.557	-1.306
Z	2.232	1.831	3.054
Prob> z	0.026**	0.067*	0.002***
No. of Observation	30	30	30
Panel C: Foreign-Owned Banks			
Mean Difference	-4.785	-0.777	-5.562
Z	-2.324	-0.896	-3.354
Prob> z	0.020**	0.370	0.001***
No. of Observation	62	72	64
Panel D: Domestic-Owned Banks			
Mean Difference	0.56	-2.673	-2.113
Z	-0.096	-2.497	-2.054
Prob> z	0.924	0.013**	0.008***
No. of Observation	96	86	94
Panel E: Kruskal Wallis Test	Year across Bank Ownership Types		
	p-value		
2003	0.110		
2007	0.391		
2011	0.827		

Legend: The descriptive statistics shown in Panel A are expressed in percentage. NPL=Non-Performing Loan. Wilcoxon-signed rank sum test results for all banks and government-owned banks are performed by comparing 2003 with 2007, 2007 with 2011, and 2003 with 2011. The percentage change in means of NPL (NPL_t-NPL_{t-1}) between two years is shown. ***, **, and * respectively correspond to 1%, 5%, and 10% significance levels

Table 5.26 provides a summary of the univariate analysis conducted for gross NPLs. Overall, the gross NPLs of FBs and DBs decrease significantly over the study period from 2003 to 2011, and GBs have the lowest NPLs over the full study period.

Table 5.26 Univariate Statistics Summary of Loan Portfolio Risk Over Different Time Periods

Period	ALL BANKS	GB	FB	DB
2003-2007	-S***	-S**	-S**	NS
2007-2011	-S***	-S*	NS	-S**
2003-2011	-S***	-S***	-S***	-S***

NS : Not Significant
+S : Significant Increase
-S : Significant Decrease

5.2.5 Loan Portfolio Returns

Figure 5.19 depicts the loan interest income ratios for each bank ownership type for the period 2003-2011. In general, all bank ownership types experience a downward trend in their loan interest income (LIntinc) from 2003 to 2011. The Bank Indonesia interest rate[45], which decreased from 12.75% in 2005 to 6% in 2011, serves as the primary determinant of bank interest rates. However, the actual changes in the LIntinc values for the different bank types are not aligned with the decrease in the Bank Indonesia interest rate of 6.75% over the study period. The LIntinc values for all bank types exhibit smaller decreases. Notably, in addition to direct interest rate change differences, this non-alignment can be attributed to other factors such as, inter alia, the effect of changes in the NPLs, EHHI and THHI of the different banks. This aspect is further addressed in the multiple regression analysis in Section 5.4. GBs exhibit the highest LIntinc values in all years, followed by DBs. FBs exhibit the lowest LIntinc values in all years.

The central bank rate has an impact on gross loan portfolio returns as there was an overall downward trend over the total research period, i.e. from 9.94% in 2003 to

[45] The Bank Indonesia rate has served as the reference rate since 2005; hence, no data are available prior to 2005.

6.58% in 2011. A 6 percent difference between the central bank rate and loan portfolio return is persistent in 2003 and 2011 since the gross loan portfolio returns of banks move in parallel downward with the central bank rate, i.e. from 16.85% in 2003 to 12.77% in 2011. However, the overall parallel movement is not the focus of the thesis as the focus is on the pricing differences between the different bank ownership types.

Figure 5.19 Loan Portfolio Return of the Government-, Foreign-, and Domestic-owned Banks

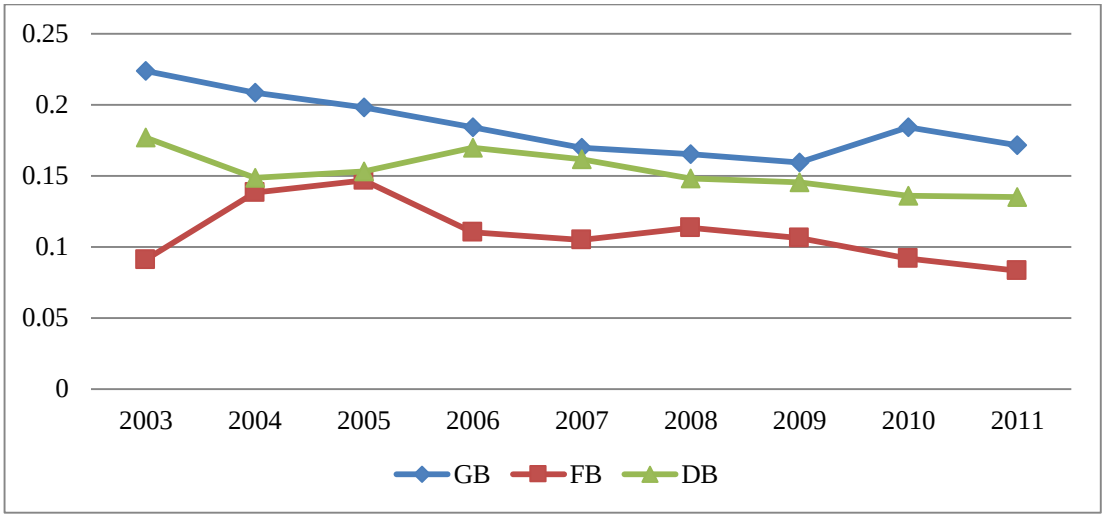


Table 5.27 contains descriptive statistics for the loan portfolio return (LIntinc) for each bank ownership type.

The combined LIntinc means for all banks decreases from 16.9% in 2003 to 12.8% in 2011. Regarding the different types of banks, GBs show the largest decrease of 5.2% over the 2003 to 2011 period, with the sharpest decrease occurring between 2007 and 2011 (3.41%). The decrease in the LIntinc value of DBs (4.1%) is slightly less than the decrease observed for GBs, although FBs show the smallest decrease (0.7%) over the nine-year research period.

Table 5.28 indicates statistically significant changes in the LIntinc for the full study period (2003-2011) and for the majority of the sub-periods for all banks, GBs and DBs. The only statistically insignificant results in this respect are observed for GBs over the 2007 to 2011 period. Considering the differences across the bank ownership

types, the LIntinc dissimilarities across bank ownership (GBs, FBs, and DBs) are, according to the Kruskal Wallis results (Panel E, Table 5.28), all statistically significant in 2003, 2007 and 2011. This result indicates that the returns of GBs, FBs and DBS differ significantly from one another.

Table 5.27 Descriptive Statistics of the Loan Portfolio Return for Different Bank Ownership Types

	2003	2007	2011
Panel A: All banks			
Median	0.167	0.147	0.127
Mean	0.169	0.146	0.128
Std. Dev.	0.092	0.059	0.055
Minimum	0.006	0.001	0.015
Maximum	0.431	0.341	0.258
Kurtosis	8.324	5.208	4.836
Skewness	1.279	0.556	0.509
Panel B: Government-Owned Banks			
Median	0.220	0.175	0.166
Mean	0.224	0.170	0.172
Std. Dev.	0.066	0.047	0.048
Minimum	0.012	0.000	0.096
Maximum	0.431	0.265	0.355
Kurtosis	4.916	7.099	8.037
Skewness	0.959	-1.302	1.772
Panel C: Foreign-Owned Banks			
Median	0.079	0.106	0.094
Mean	0.091	0.105	0.083
Std. Dev.	0.061	0.040	0.039
Minimum	0.002	0.009	0.005
Maximum	0.307	1.193	0.151
Kurtosis	6.876	3.202	1.973
Skewness	1.674	-0.042	-0.230
Panel D: Domestic-Owned Banks			
Median	0.169	0.154	0.130
Mean	0.177	0.162	0.135
Std. Dev.	0.092	0.063	0.043
Minimum	0.006	0.001	0.020
Maximum	0.641	0.372	0.250
Kurtosis	13.835	6.017	4.525
Skewness	2.222	1.124	0.404

Legend: The descriptive statistics shown in Panel A-D are expressed in percentage. LIntinc = Loan Portfolio return as measured by the ratio of loan interest income to average total loans

Table 5.28 Univariate Statistics of Loan Portfolio Return for Different Bank Ownership Types

	2003-2007	2007-2011	2003-2011
Panel A: All banks			
Mean Difference	-0.023	-0.273	-0.041
Z	4.010	5.183	5.954
Prob> z	0.000***	0.000***	0.000***
No. of Observation	109	109	109
Panel B: Government-Owned Banks			
Mean Difference	-0.054	-0.341	-0.052
Z	4.371	1.409	3.774
Prob> z	0.000***	0.159	0.000***
No. of Observation	30	30	30
Panel C: Foreign-Owned Banks			
Mean Difference	0.014	-0.188	-0.007
Z	1.938	-1.955	-0.116
Prob> z	0.053*	0.050**	0.908
No. of Observation	62	72	64
Panel D: Domestic-Owned Banks			
Mean Difference	-0.015	-0.297	-0.042
Z	-1.757	-2.488	-3.742
Prob> z	0.078*	0.013**	0.000***
No. of Observation	96	86	94

Panel E: Kruskal Wallis Test	Year across Bank Ownership Types			
2003	0.000***			
2007	0.000***			
2011	0.000***			

Legend: The descriptive statistics shown in Panel A are expressed in percentage. LIntinc=Loan Portfolio return as measured by the ratio of loan interest income to average total loans. Wilcoxon-signed rank sum test results for all banks and government-owned banks are performed by comparing 2003 with 2007, 2007 with 2011, and 2003 with 2011. Mann-Whitney tests are conducted for foreign and domestic-owned banks. The percentage change in means of LIntinc ($LIntinc_t$-$LIntinc_{t-1}$) between two years is shown. Panel B shows the Kruskal Wallis test results for the comparison of the medians of gross interest income of all the three bank types in 2003, 2007 and 2011. The ***, **, and * respectively correspond to 1%, 5%, and 10% significance levels

Table 5.29 summarises the univariate statistics for the LIntinc values of the different types of banks. In summary, the combined LIntinc value of Indonesian banks and the

LIntinc value of DBs change significantly over the 2003 to 2007 period, the 2007 to 2011 period and the full 2003 to 2011 period. Changes in the LIntinc values of GBs are significant for the 2003 to 2007 period and the full 2003 to 2011 period but not for the 2007 to 2011 period. FBs, however, show significant LIntinc changes for the 2003 to 2007 and 2007 to 2011 periods but not for the full 2003 to 2011 period.

Table 5.29 Summary of Univariate Statistics on Loan Portfolio Return Over Time

Period	ALL BANKS	GB	FB	DB
2003-2007	-S***	-S***	+S*	-S*
2007-2011	-S***	NS	-S**	-S**
2003-2011	-S***	-S***	NS	-S***

NS : Not Significant
+S : Significant Increase
-S : Significant Decrease

When combining the findings on loan portfolio composition (Sections 5.2.2.2 and 5.2.3) and risk (NPLs discussed in Section 5.2.4) with the findings on returns in this section, the following statements can be made:

- Overall, the EHHI and THHI of Indonesian banks change significantly over the study period of 2003 to 2011. The changes represent diversification by FBs and DBs and increased concentration by GBs. However, the combined EHHI and THHI of all bank ownership types indicate overall diversification over the 2003 to 2011 period.
- The more focused loan portfolio composition applied by GBs is essentially dominated by two major sectors, namely, the unspecified (other) and trade sectors, whereas the more diversified loan portfolios of FBs and DBs are spread across four major sectors: trade, others, manufacturing and business services.
- The loan type portfolio composition of GBs differs extensively from that of FBs and DBs. GBs primarily focus on consumption loans, which increase from 61% to 69% of their total loans over the 2003 to 2011 period. Working capital loans constitute the majority of the loans for both FBs and DBs,

although the percentage of working capital loans of FBs exceeds that of DBs in all years. The working capital loans of DBs decreased by 7.97% over the 2003 to 2011 period, with a nearly identical increase in investment loans. Therefore, it is evident that FB loan exposures are primarily short term and targeted at business entities. However, whereas DBs also focus on providing short-term loans to business entities, they are more diversified because they partially replace such lending with long-term investment loans over the period considered.

- The gross NPLs of Indonesian banks change significantly over the study period of 2003 to 2011. The changes result from substantial decreases in the NPLs of FBs and DBs.
- The differences in the returns of the different bank ownership types are significant in 2003, 2007 and 2011, and significant changes in their returns are observed over the 2003 to 2011 period. The returns of GBs change the most, followed by changes in the returns of DBs. FBs exhibit the least change over the study period.

5.3 Pearson Correlations

Table 5.30 below displays the Pearson correlation matrix for the variables (EHHI, THHI, NPLs, and LIntinc) that were discussed in the preceding sections for 2003, 2007 and 2011 and the correlation for the full study period. Additional variables (LnTA, EQUITY and LQDT) that serve as control variables also form a portion of the correlation matrix. The reasons for the inclusion of these control variables are discussed in Chapter 4, Section 4.5.2.

Table 5.30 Pearson Correlation Matrix

Panel A:Year 2003	LIntinc	EHHI	THHI	NPL	LnTA	EQUITY	LQDT
LIntinc	1						
EHHI	0.176*	1					
THHI	-0.036	0.528***	1				
NPL	-0.100	-0.059	0.007	1			
LnTA	-0.217**	-0.066	0.009	0.120	1		
EQUITY	-0.074	-0.126	-0.152	-0.051	-0.442***	1	
LQDT	-0.158	0.157	0.178*	0.179*	0.026	0.081	1
Year 2007	LIntinc	EHHI	THHI	NPL	LnTA	EQUITY	LQDT
LIntinc	1						
EHHI	0.221**	1					
THHI	0.043	0.486***	1				
NPL	-0.103	-0.116	-0.163*	1			
LnTA	-0.290***	-0.104	-0.245**	-0.072	1		
EQUITY	0.204**	-0.081	0.184*	-0.099	-0.510***	1	
LQDT	-0.207**	-0.019	0.090	0.129	-0.054	0.201**	1
Year 2011	**LIntinc**	**EHHI**	**THHI**	**NPL**	**LnTA**	**EQUITY**	**LQDT**
LIntinc	1						
EHHI	0.418***	1					
THHI	-0.009	0.574***	1				
NPL	0.111	-0.072	-0.257***	1			
LnTA	-0.145**	-0.141	-0.249***	0.059	1		
EQUITY	0.044	0.011	0.162*	0.055	-0.795***	1	
LQDT	-0.220**	0.122	0.208**	0.075	-0.156	0.167*	1

Table 5.30 Pearson Correlation Matrix (continued)

Panel B: 2003-2011	LIntinc	EHHI	THHI	NPL	LnTA	EQUITY	LQDT	IR	GDP
LIntinc	1								
EHHI	0.132***	1							
THHI	0.027	0.552***	1						
NPL	-0.026	-0.087***	-0.085***	1					
LnTA	-0.097***	-0.110***	-0.178***	0.038	1				
EQUITY	-0.009	-0.007	0.049	-0.028	-0.508***	1			
LQDT	-0.126***	0.061*	0.116***	0.066**	-0.072**	0.132***	1		
IR	0.082**	0.040	0.050	0.036	-0.041	-0.125***	-0.082**	1	
GDP	-0.144***	-0.062*	-0.056*	-0.141***	0.131***	0.172***	0.217***	-0.503***	1

Legend: This table presents Pearson correlations of continuous variables, for year 2003, 2007, 2011 (Panel A) and overall period of 2003 to 2011 (Panel B). LIntinc is the loan portfolio return measured by ratio of loan interest income to average total loans. EHHI is the loan portfolio concentration based on economic sector. THHI is the loan portfolio concentration based on loan types. NPL is the repayment default risk of loan portfolio. EQUITY is the equity ratio. LQDT is the liquidity ratio. IR is the interest rate and GDP is macroeconomic variable measured by end of year constant GDP.

The most prominent significant correlation is between EHHI and THHI in all three key years and throughout the study period (2003 to 2011). The correlation between EHHI and LIntinc is also significant in all key years and over the full study period. Therefore, it appears that the sectoral loan concentration has a significant overall relationship with banks' loan interest income (loan portfolio return). The correlation of EHHI with NPLs and LnTA is not significant in any of the key years (2003, 2007 and 2011), although there is a significant relationship between EHHI and NPL and LnTA when considering the full period (2003 to 2011). The significant positive correlation between EHHI and NPLs indicates that greater concentration can be associated with more NPLs, whereas the significant negative correlation between EHHI and LnTA indicates that larger banks present less economic sector concentration than smaller banks.

THHI has no significant correlation with LIntinc, but it is significantly negatively correlated with NPL and LnTA in 2007 and 2011 and over the full period (2003 to 2011). In this context, it is evident that banks with higher loan type concentration

levels experience less loan repayment default and that larger banks are less loan type concentrated (more diversified).

LnTA exhibits a significant and negative correlation with the LIntinc of banks in 2003, 2007, 2011 and over the full period (2003 to 2011). Therefore, the larger banks are, the smaller their loan interest income percentages are (loan portfolio returns). EQUITY only shows significant positive correlation with Lintinc in 2007. A significant (5% level) negative correlation exists between LQDT and LIntinc in 2007, 2011 and throughout the period. However, the correlations are very low (less than 0.3%) for all periods.

Overall, the correlation coefficients in Table 5.30 indicate that multicollinearity[46] does not exist, as the maximum correlation coefficient in the matrix is 57.41%, between EHHI and THHI in 2011. According to Gujarati (2009), multicollinearity becomes a concern if the correlation coefficient between two independent variables is 0.8 or more. However, to determine the linear relationships among more than two variables, tolerances and variance inflation factor (VIF) measurements are required. In such circumstances, unacceptable multicollinearity exists if the VIF of a variable is above 10 and the measure of tolerance is less than 0.1 (Pallant, 2011). The result of the VIF test for multicollinearity in this study indicates that the VIF value range is far below 10. The tolerance is greater than 0.1. Given these results, multicollinearity does not pose a multiple regression problem (see Appendix B).

5.4 Multivariate Analysis

This section presents the multivariate findings of this research, the aim of which is to investigate the relationship between bank ownership types, their loan portfolio structures (EHHI and THHI concentration) and their credit risk (NPLs), and their loan portfolio return (LIntinc). Multiple regression is estimated for three key years (2003, 2007 and 2011), followed by panel data regression conducted for the nine-year research period. Control and macroeconomic variables are also included in the regression model (refer to Chapter 4, Section 4.5).

[46] Multicollinearity is defined as a condition in which an independent variable is highly correlated with other independent variable (s) (Hair, 2006).

The assessment of the validity of the multiple regression model for 2003, 2007 and 2011 in terms of normality, linearity, homoscedasticity and multicollinearity is satisfactory (see Appendix B, which contains the residual scatterplots, and Table 5.30, which displays correlations).[47] Table 5.31 contains the estimation results for equation 7 (Chapter 4, Section 4.7).

Table 5.31 Cross–Sectional Multiple Regression of Loan Portfolio Return Determinants

			2003			2007			2011
Adjusted R2			0.322			0.293			0.452
F-Statistic			7.41			6.58			12.12
Significance			0.000***			0.000***			0.000***
	Coeff.	t-Stat	P-value	Coeff.	t-Stat	P-value	Coeff.	t-Stat	P-value
Constant	0.265	3.11	0.002***	0.162	2.49	0.014**	0.184	3.94	0.000***
GBs	0.052	2.43	0.017**	0.005	0.33	0.740	0.028	2.25	0.026**
FBs	-0.079	-3.62	0.000***	-0.047	-3.47	0.001***	-0.039	-3.32	0.001***
EHHI	0.048	1.02	0.310	0.062	1.93	0.056*	0.075	2.81	0.006***
THHI	0.031	0.68	0.496	-0.005	-0.15	0.881	-0.029	-0.99	0.324
NPLs	0.002	2.71	0.008***	0.001	1.67	0.098*	0.004	1.71	0.090*
Ln TA	-0.009	-1.63	0.107	-0.002	-0.45	0.651	-0.004	-1.43	0.155
EQUITY	-0.012	-0.16	0.873	0.112	2.43	0.017**	-0.0000	-0.44	0.663
LDR	-0.0002	-1.04	0.299	-0.0003	-1.77	0.080*	-0.0001	-1.42	0.159

Legend: The table shows the results of the OLS cross sectional regression of the independent variables and control variable on loan portfolio return for all banks in 2003, 2007 & 2011. Indicators of statistical significance are *, **, and *** at the 10%, 5%, and 1% levels.

DBs (captured by the constant) and FBs have significant coefficients in all three key years, whereas the coefficient for GBs is only significant in 2003 and 2011. The EHHI coefficients are significant in 2007 and 2011, and the coefficients of NPLs in all key years also yield significant results (Table 5.31). These results indicate that

[47]The normality assumption is satisfied because the residual scatter plot reveals a clustering of residuals at the centre of the plot at each value of the predicted score and a normal distribution of residuals trailing symmetrically from the centre. The degree of linearity is also satisfactory because the overall shape of the scatter plot is rectangular. The heteroscedasticity is satisfactory because the regression considers robust standard errors. The regression is satisfactory with respect to multicollinearity because no correlation coefficient of 0.8 or higher exists between independent variables.

bank ownership types have prominent relationships with loan portfolio returns in the majority of the key years.

To determine whether the significance of DBs is truly reflected by the constant, the fixed-effects model that only includes the DB dummy is re-estimated. The result supports the significant relationship between DBs and loan portfolio returns for 2007 but not for 2003 or 2011.

The negative coefficient of FBs indicates that in all years, FBs experience lower returns than DBs. Conversely, the significantly positive coefficient of GBs in 2003 and 2011 indicates that they have the highest returns in those periods. The positive coefficients of EHHI in all years demonstrate the advantage of concentrated focus strategies applied by banks because the more sectorally concentrated their portfolios are, the higher their returns are.

However, THHI has a negative relationship with returns in 2007 and 2011, indicating that more diversified loan type bank portfolios only become important in later years because the relationship is not significant for 2003. NPLs exhibit significant positive relationships with loan portfolio returns for all key years. Thus, higher loan portfolio repayment defaults lead to higher loan portfolio returns. Because repayment defaults are expected to decrease returns, this positive relationship may be the result of banks pricing loans differently based on credit risk assessments.

The control variable, EQUITY, only exhibits a significantly positive relationship with loan portfolio returns in 2007, not in 2003 and 2011, and can therefore not be regarded as a prevailing tendency. In this regard, no previous research could be retrieved that focuses on any relationship between equity and loan portfolio returns. A theoretical text by Hogan et al. (2004) suggests that banks can apply higher equity levels to absorb the risk of aggressive lending strategies. However, the correlation between EQUITY and NPL is negative in this study, and therefore does not confirm this statement predicting the existence of a significant relationship between bank liquidity and loan portfolio return for 2007. Although it is not significant in 2003 or 2007, this result partially supports the findings of Molyneux and Thornton (1992) regarding the negative relationship between liquidity and overall bank profitability.

To identify which empirical methodology (pooled or fixed effects) is appropriate for the panel data regression, the Breusch-Pagan Lagrangian multiplier test is performed. The test rejects the null hypothesis at the 5% significance level. This result means that the application of OLS is inappropriate because it would lead to bias and inconsistent estimates resulting from the presence of heteroscedastic disturbances. The Hausman test performed subsequently recommends the use of a fixed-effects model rather than a random-effects model because it allows for correlation between the unobserved individual effects and the explanatory variables.

Year dummies are applied in the panel data regression model to analyse the effects of loan portfolio concentration, composition and risk on loan portfolio return to eliminate common phenomena present across all banks in specific years.

Table 5.32 presents the panel data regression results with the application of the vce robust command. DBs, GBs, EHHI, and GDP are the independent variables that significantly affect loan portfolio returns. The positive coefficients of the GB dummy regressors are higher than the coefficients of the DBs. This result is similar to the descriptive and multiple regression results (refer to Sections 5.2.5 and 5.4). GBs have significant and positive loan portfolio returns that are higher than those of DBs, whereas the loan portfolio returns of FBs are not meaningfully different from those of DBs.

A significantly negative relationship exists between EHHI and loan portfolio returns, indicating that the more sectorally concentrated banks are, the lower their returns are. This finding contradicts the multiple regressions for 2003, 2007 and 2011 showing that the more sectorally concentrated banks are, the higher their returns are. The result of the panel data regression, which considers all years instead of the selected years used in the multiple regression analysis, indicates that sectoral diversification is more beneficial to banks. None of the control variables has a significant relationship with loan portfolio returns. Finally, the significant negative relationship between GDP and loan portfolio returns reflects the impact of economic cycles on the portfolio returns from market segments in which banks conduct business.

Table 5.32 Panel Data Regression: Relationship between Bank Ownership Types, Loan Portfolio Structures, and Loan Portfolio Repayment Default Risk with Loan Portfolio Returns

		Loan Portfolio Return
CONSTANT	**Coefficient**	0.153*****
	t-Statistic	**1.820**
GB	**Coefficient**	**0.035****
	t-Statistic	**2.450**
FB	**Coefficient**	**-0.010**
	t-Statistic	**-1.100**
EHHI	**Coefficient**	**-0.056***
	t-Statistic	**-1.740**
THHI	**Coefficient**	**0.120**
	t-Statistic	1.470
NPL	**Coefficient**	0.001
	t-Statistic	0.850
LN TA	**Coefficient**	**0.001**
	t-Statistic	0.340
EQUITY	**Coefficient**	0.000
	t-Statistic	0.190
LQDT	**Coefficient**	-0.000
	t-Statistic	-0.740
INT.RATE	**Coefficient**	0.000
	t-Statistic	0.260
GDP	**Coefficient**	-0.000***
	t-Statistic	-2.770
Fixed Effect		Yes
Year Dummy		Yes
Number of Observations		981
Number of Banks		109
R-squared [48]		0.461
Adjusted R-squared		0.382

Legend: This table present the results of equations 7. The dependent variable is Loan Portfolio Return (Loan Interest Income-LIntinc). The independent variables are bank ownership types (Government-owned banks (GB), Foreign-owned banks (FB) and Domestic Banks (DB)), loan portfolio concentration based on economic sector (EHHI) and based on loan types (THHI), and loan portfolio risk (NPL). Size (LnTA) , Capital (EQUITY) and liquidity (LQDT) serve as the control variables while Interest rate (INT.RATE) and economic growth (GDP) serve as macroeconomic variables. The table contains coefficients and t-statistics from fixed effect panel data regression with robust standard errors. Definitions of variables are provided in chapter four. ***, **, and * respectively correspond to 1%, 5%, and 10% significance levels.

Additionally, the effect of the GFC on the relationship between the independent variables and the loan portfolio returns is reflected in Table 5.33.

[48] The calculation of R-squared and adjusted R-squared are obtained from running areg for the model (See: the explanation in chapter four).

Table 5.33 Panel Data Regression: The Relationship between Bank Ownership Types, Loan Portfolio Structures, and Loan Portfolio Default Repayment Risk with Loan Portfolio Return (Crisis Control Effect)

		Loan Portfolio Return
CONSTANT	**Coefficient**	0.170***
	t-Statistic	**3.67**
GB	**Coefficient**	**0.045****
	t-Statistic	**2.00**
GBXPOST	**Coefficient**	**-0.12**
	t-Statistic	**-0.97**
FB	**Coefficient**	**-0.003**
	t-Statistic	**-0.18**
FBXPOST	**Coefficient**	**-0.010**
	t-Statistic	**-0.36**
EHHI	**Coefficient**	**-0.07**
	t-Statistic	**-1.59**
EHHIXPOST	**Coefficient**	**0.018**
	t-Statistic	**0.70**
THHI	**Coefficient**	**0.146***
	t-Statistic	1.78
THHIXPOST	**Coefficient**	**-0.051****
	t-Statistic	-2.11
NPL	**Coefficient**	**0.001**
	t-Statistic	0.71
NPLXPOST	**Coefficient**	**-0.001**
	t-Statistic	-0.95
LNTA	**Coefficient**	**0.001**
	t-Statistic	0.48
LNTAXPOST	**Coefficient**	**-0.001**
	t-Statistic	-0.31
EQUITY	**Coefficient**	0.013
	t-Statistic	0.33
EQUITYXPOST	**Coefficient**	**-0.013**
	t-Statistic	-0.33
LQDT	**Coefficient**	-0.000
	t-Statistic	-1.16
LQDTXPOST	**Coefficient**	**0.000**
	t-Statistic	0.79
INT.RATE	**Coefficient**	0.001
	t-Statistic	0.98
INT.RATEXPOST	**Coefficient**	-0.001
	t-Statistic	-0.81
GDP	**Coefficient**	-0.000**
	t-Statistic	-2.01
GDPXPOST	**Coefficient**	0.000
	t-Statistic	0.72
Fixed Effect		Yes
Year Dummy		No
Number of Observations		981
Number of Banks		109
R-squared [1]		0.4642
Adjusted R-squared		0.3808

Legend: This table present the results of equations 7. The dependent variable is Loan Portfolio Return (Loan Interest Income-LIntinc). The independent variables are bank ownership type (in the form of Government-owned banks (GB), Foreign-owned banks (FB) and Domestic Banks (DB), as the base case.), loan portfolio concentration based on economic sector (EHHI) and based on loan types (THHI), and loan portfolio risk (NPL). Size (LnTA) , Capital (EQUITY) and liquidity (LQDT) serve as the control variables while Interest rate (INT.RATE) and Economic Growth (GDP) serve as macroeconomic variables. The table contains coefficients and t-statistics from fixed effect panel data regression with robust standard errors. Definitions of variables are provided in chapter four. ***, **, and * respectively correspond to 1%, 5%, and 10% significance levels. The year dummy is taken out because they are collinear with post GFC.

Based on the information in Table 5.33, the only significant GFC interaction effect exists for THHI; the negative relationship between this index and loan portfolio returns is more significant during the post-crisis period (2008-2011). This result indicates that more diversified product type loan portfolios provide higher loan portfolio returns in the post-crisis period relative to the pre-crisis period.

5.5 Summary

This chapter analyses the changes in and differences among GBs, FBs and DBs in Indonesia with respect to their loan portfolio concentration, loan portfolio composition, loan repayment default risk, and loan portfolio returns.

The overall EHHI and THHI concentration levels of Indonesian banks change significantly over the study period of 2003 to 2011. The changes represent diversification by FBs and DBs and increased concentration by GBs. However, when the EHHI and THHI values of all bank ownership types are combined, the result indicates a general trend towards diversification over the 2003 to 2011 period, with EHHI and THHI changing, respectively, from 0.434 and 0.615 in 2003 to 0.402 and 0.582 in 2011.

The EHHI differences across bank ownership types (GBs, FBs and DBs) are statistically significant in 2003, 2007 and 2011, as demonstrated by the Kruskal Wallis results. Thus, clear sectoral portfolio concentration differences exist across the different bank types over the 2003 to 2011 study period.

Significant differences in sectoral loan allocation occur during the 2007-2011 period, thus providing evidence of the adjustments made by the banks in response to the GFC. Loans allocated to the mining and electricity sectors by all bank ownership types increased significantly during the 2007 to 2011 and 2003 to 2011 periods, whereas loans allocated to the manufacturing sector by FBs and DBs significantly decreased over the 2003 to 2011 period.

Comparing the sector loan portfolio composition with the sector concentration (as measured by EHHI), the more focused loan portfolio composition applied by GBs is essentially dominated by two major sectors, namely, the unspecified (other) and trade

sectors. The more diversified loan portfolios of FBs and DBs are spread across four major sectors, namely, trade, others, manufacturing and business services.

The loan type portfolio composition of GBs differs extensively from that of FBs and DBs. GBs primarily focus on consumption loans, and significant increases in these loans (from 61% to 69%) are evident over the 2003 to 2011 period. Thus, GBs are more active in the retail segment and focus on consumption financing. FBs and DBs exhibit similarities in their loan type compositions; for example, working capital loans represent the majority of the loans of both bank types. However, DBs that also focus on providing short-term loans to business entities are more diversified than FBs and further diversify their product types by replacing working capital loans to a certain extent with long-term investment loans.

The NPLs of the different bank types differ to the greatest extent in 2003, but the differences decrease with minor NPL differences remaining in 2011. The NPL levels of GBs are lower than those of FBs and DBs from 2003 to 2010 and exhibit very little volatility compared to the NPLs of FBs and DBs. The NPLs of the FBs and DBs only decrease to the same levels as those of GBs in 2011. Overall, the NPLs of all banks combined decrease from 4.692% in 2003 to 1.947% in 2011. This result indicates that the overall credit risk of banks decreases and the quality of their loan portfolios improves over the nine-year study period. Regulation PBI 2/11/PBI/2000 jo PBI 15/2/PBI/2013 of the central bank, which imposed a 5% maximum threshold for the net NPL ratio, may be one of the reasons for such adjustments (Bank Indonesia, 2013a).

The combined gross LIntinc means for all banks decrease from 16.9% in 2003 to 12.8% in 2011. Regarding the different types of banks, GBs exhibit the largest decrease in gross LIntinc (5.2%) over the 2003 to 2011 period compared to the other types of banks, with the sharpest decrease being observed between 2007 and 2011. The decrease in the gross LIntinc of DBs (4.2%) is slightly less than the decrease experienced by GBs, but FBs show the smallest decrease (0.7%) over the nine-year research period. The differences in the returns of the different bank ownership types are significant in 2003, 2007 and 2011.

The multivariate, cross-sectional analysis for each of the key years (2003, 2007, 2011) indicates that:

- In 2003: GBs and FBs had significant relationships with loan portfolio return.
- In 2007: DBs and FBs had significant relationships with loan portfolio return.
- In 2011: GBs and FBs had significant relationships with loan portfolio return.

Therefore, it can be concluded that bank ownership type has a significant relationship with loan portfolio return in the research period.

When controlling for year effects using year dummies for the bank ownership type variables, DBs, GBs EHHI, and GDP significantly affect loan portfolio returns as measured by loan interest income. The positive coefficients of the GB dummy regressors indicate that the relationship between GBs and loan portfolio returns is greater than that of DBs. These findings also provide evidence that bank ownership types affect loan portfolio return – similar to the univariate finding that the loan portfolio returns of the different bank types are significant in the key years 2003, 2007 and 2011. The result that bank ownership type is a determinant of bank loan portfolio returns is consistent with the findings of De-Haas et al. (2010). Sectoral loan concentration is also a significant variable. The panel data regression covering the full study period reveals that the more concentrated banks are, the lower their loan portfolio returns are. Although a contradictory relationship is reflected in the multivariate analysis for the three key years 2003, 2007 and 2011, the panel data regression analysis is more comprehensive and representative.

Finally, the negative and significant relationship between GDP and loan portfolio return represents the impact of economic cycles on the portfolio return from market segments in which banks conduct business.

In brief, the combined findings of the univariate and multivariate analysis in this chapter support the hypothesis that GBs, DBs and FBs differ with respect to loan portfolio composition, risk and return and that these differences result in different loan portfolio returns.

Chapter 6
SUMMARY AND CONCLUSION

6.1 Introduction

Chapter 1 provided the background for this study, the problem statement, the research objectives and a brief overview of the literature and empirical research to be conducted. Chapter 2 provided a review of the existing literature on bank ownership types, their loan portfolios, and their risk and return, while Indonesian regulations on credit risk management were discussed in Chapter 3. The research methodology and findings of this study were discussed in Chapters 4 and 5, respectively. This chapter provides concluding insights from this study, followed by limitations, contributions and recommendations for future research.

6.2 Summary

The 1997 Asian financial crisis led to numerous strategic and operating challenges for banking regulators and supervisors in Indonesia. Having been severely affected by the crisis, Indonesia subsequently implemented banking industry reforms that, inter alia, included changes in its bank ownership structures and extensive credit risk regulations. However, no previous study had assessed the impact of the existing ownership structures and loan portfolio composition of banks in Indonesia.

This research aimed to determine the impact of the bank ownership types, loan portfolio concentration and risk on the loan portfolio return of banks over the period 2003-2011.

The literature review focused on the following: classification methods used for different types of bank ownership; the classification of different bank types and research findings on the subject; bank loan portfolio composition and performance; the relationship between bank ownership types and loan portfolio composition; and, the identification of the gap between existing knowledge and research. This chapter concludes by indicating how this study will enhance the level and spectrum of research in this area.

Previous studies provide evidence of differences in the performance of banks based on their ownership types. The majority of research indicates that foreign banks outperform domestic- and government-owned banks; however, some research (Chen and Liao, 2011, Mian, 2003, Bonin et al., 2005) indicates that domestic-owned banks perform better than foreign-owned banks. Previous research also demonstrates that in many circumstances, loan portfolio diversification does not necessarily improve risk-return relationships. Acharya et al. (2002) found that diversification produced riskier loan portfolios for high-risk banks and reduced bank returns. In terms of scope, the majority of extant studies were conducted in developed countries, such as Italy by Acharya et al. (2002) and Germany by Hayden et al. (2006). Research has also been conducted in emerging countries, including Brazil by Tabak et al. (2011a) and Argentina by Berger et al. (2005). However, research on the subject in Asia is rare.

Although researchers such as Bonin et al. (2005), Berger et al. (2005), and Taboada (2011) have comprehensively examined the impact of bank ownership on performance, they did not compare the relationships between bank ownership types and loan portfolio compositions based on product types or sectoral compositions. Therefore, this research extends the literature by incorporating loan product type and sectorial portfolio composition with a specific focus on Indonesia, which underwent a massive banking reform after the devastation of the 1997/1998 financial crisis.

Following the literature review, the Indonesian bank regulations instituted over the period 1967 to 2011 were discussed, focusing on the post-Asian crisis period (2002 onwards).

After considering previous research and the changes in the banking industry and credit risk regulations in Indonesia, this study analyses the post-Asian financial crisis era with regard to the different types of bank ownership, their loan portfolio structures (composition and concentration), risk and their loan portfolio returns using descriptive, univariate and multivariate statistics. The descriptive analysis is performed to provide a preliminary understanding of trends and deviations in the data. The univariate analysis occurs via means tests across many years and across bank ownership types for the continuous variables of loan portfolio concentration, risk and return. The objective is to assess the differences and changes in each of the variables for the different bank ownership types. Finally, multivariate statistical

analysis is performed to determine the factors affecting loan portfolio return. This analysis consists of multiple regression and fixed-effects panel data regression.

6.3 Findings and Conclusions

The combined univariate and multivariate analysis findings in this study indicate that GBs, DBs and FBs differ with respect to loan portfolio concentration, composition, and risk. These differences result in different loan portfolio returns.

The literature on loan portfolio concentration provides evidence of a trend towards diversification (Pfingsten and Rudolph, 2002, Behr et al., 2007, Hayden et al., 2006). In addition, certain governing rules such as the legal lending limits that central banks impose on banks are favourable for diversification.

The overall EHHI and THHI of Indonesian banks change significantly over the study period from 2003 to 2011. The changes represent diversification by FBs and DBs and increased concentration by GBs. A focus strategy applied by GBs indicates their concentration on specific segments for which they have superior knowledge and monitoring ability. Focusing on a specific segment is effective when banks face information asymmetry (Acharya et al., 2002, Kamp et al., 2005, Berger et al., 2010, Tabak et al., 2011b). However, the combined EHHI and THHI of all bank ownership types indicate overall diversification during the 2003 to 2011 period. The diversification trend appears to indicate that the lending limit regulation enacted by Bank Indonesia plays an important role in this trend towards diversification. This research supports the findings of Pfingsten and Rudolph (2002), Behr et al. (2007), and Hayden et al. (2006), who observed a similar trend towards diversification for German banks during the 1990s and early 2000s.

The differences in loan portfolio concentration based on economic sector (EHHI) across bank ownership types (GBs, FBs and DBs) are statistically significant in 2003, 2007 and 2011, as demonstrated by the Kruskal Wallis test results. Thus, clear sectoral portfolio concentration differences exist across the different bank types over the 2003 to 2011 study period.

Previous research by De-Haas et al. (2010) and Degryse et al. (2012) suggests that different bank ownership types may focus on different borrower types, as reflected in

their loan portfolio compositions. The different loan portfolio compositions result from, inter alia, differences in organisational structure, access to liquidity, exposure to asymmetric information (Degryse et al., 2012), motives, technology and innovation capacity (Berger et al., 2005).

The sectoral loan allocation differs significantly across the different bank types in the 2007-2011 period, thus providing evidence of the adjustment banks made in response to the GFC. Loans allocated to the mining and electricity sectors by all bank ownership types increased significantly during the 2007 to 2011 and 2003 to 2011 periods, whereas loans allocated to the manufacturing sector by FBs and DBs decreased significantly over the 2003 to 2011 period.

The reason behind DBs' tendency to shift away from financing the manufacturing sector is unclear; it is unknown whether the demand for loans from this sector decreased or whether the banks attempted to reduce their loan portfolio risk. If the latter were true, this finding would contradict research by Detragiache et al. (2008), who found that DBs had risky loan portfolios. For FBs, the shift away from the manufacturing sector may be related to their home country experience in the retail market (De-Haas et al., 2010).

Comparing the sector loan portfolio composition with the sector concentration (as measured by EHHI), the more focused loan portfolio composition applied by GBs is essentially dominated by two major sectors, namely, the unspecified (other) and trade sectors, whereas the more diversified loan portfolios of FBs and DBs are spread across trade, others, manufacturing and business services.

Notably, government-owned banks do not have large loan exposures in sectors such as electricity, gas and water, mining, transport and communication, and social services, which may have a substantial impact on a country's economic development. These findings do not align with the social theory stating that government-owned banks are agents of development. The requirement established by Banking Act 7/1992 for Indonesian GBs to operate as profit-maximising institutions may contribute to this result. In this regard, the big four GBs are publicly listed companies that are required to maximise shareholder wealth.

The loan type portfolio composition of GBs differs extensively from that of FBs and DBs. GBs primarily focus on consumption loans, and significant increases in these

loans (from 61% to 69%) are evident over the 2003 to 2011 period. Thus, GBs are more active in the retail segment and focus on consumption financing. Because the managers of GBs are generally government bureaucrats, their risk-averse profile may affect their decision to focus on specific segments; engaging in diversification would incur additional costs in searching for high-quality borrowers in other segments (Rossi et al., 2009).

FBs and DBs exhibit similarities in their loan type compositions; for example, working capital loans represent the majority of loans for both bank types. However, DBs, which also focus on short-term loans to corporations, are more diversified than FBs because of less concentration on single loan types. They are more diversified with a larger proportion of long-term investment loans in their portfolios.

Previous findings have varied regarding loan repayment default risk as measured by NPL for each bank ownership type. Berger et al. (2005) indicate that GBs experience high levels of NPLs that decline after GB privatisation, whereas Bonin et al. (2005) and Mian (2003) suggest that DBs have a lower level of NPLs than FBs. Conversely, Detragiache et al. (2008) find that DBs have higher levels of loan-loss provisions.

The NPLs of the different bank types differ to the greatest extent in 2003, although the differences decrease with minor NPL differences remaining in 2011. The NPL levels of GBs are the lowest from 2003 to 2010 and exhibit very little volatility compared to those of FBs and DBs. These findings contradict those of Berger et al. (2005). The NPLs of the FBs and DBs only decrease to the same levels as those of GBs in 2011. Overall, the combined NPLs of all banks decrease from 4.692% in 2003 to 1.947% in 2011. This result indicates that the overall credit risks of banks decrease and the quality of their loan portfolios improves over the nine-year study period. In essence, this result indicates that banks may have adjusted their credit risk assessment and/or qualifying criteria for loans. Bank Indonesia regulation PBI 2/11/PBI/2000 jo PBI 15/2/PBI/2013, which imposed a 5% maximum threshold for the net NPL ratio, may be a factor contributing to such adjustments (Bank Indonesia, 2013a).

GBs with higher economic sector concentration risks experience lower loan portfolio repayment default risk as measured by NPLs. This finding is consistent with those of Tabak et al. (2011a) but contradicts the ideas of Diamond (1984). As noted by Rossi

et al. (2009), focusing on certain market segments (a more concentrated loan portfolio) may reduce default/intrinsic risk due to higher monitoring efficiency and improved individual loan quality. The comparatively higher risk experienced by DBs and FBs, which have more diversified loan portfolios, is supported Acharya et al. (2002), who suggest that increasing diversification may increase risk because of reduced monitoring efficiency and competition with other banks, which may lead to adverse selection problems and scale inefficiencies.

The combined mean loan portfolio return (LIntinc) for all banks decreases from 16.7% in 2003 to 12.8% in 2011. The differences in the returns of the different bank ownership types are significant in 2003, 2007 and 2011. Regarding the different types of banks, GBs exhibit the largest decrease in LIntinc (5.2%) over the 2003 to 2011 period compared with the other types of banks, with the major decrease observed between 2007 and 2011. The decrease in the LIntinc values of DBs (4.1%) is slightly less than the decrease for GBs, but FBs exhibit the smallest decrease (0.7%) over the nine-year research period. The observation that FBs are less profitable than DBs contradicts the findings of Claessens et al. (2001) and Chen and Liao (2011). According to Claessens et al. (2001), FBs in developing countries realise higher profits because they enjoy higher interest margins than domestic banks. In addition, Taboada (2011) suggests that the high interest margins of FBs may emanate from their exemption from loan allocation regulations and restrictions that typically burden bank margins. The differences in the results might be explained by the use of loan interest income in this research instead of return on assets and return on equity.

The findings on loan portfolio structures (composition and concentration) indicate that in many circumstances, loan portfolio diversification does not necessarily improve risk-return relationships. This finding supports the work of researchers including Winton (1999), Acharya et al. (2002), Hayden et al. (2006), (Behr et al., 2007), and Tabak et al. (2011a).

The multivariate, cross-sectional analysis for each of the key years (2003, 2007, 2011) suggests the following:

- In 2003: GB and FB ownership types had significant relationships with loan portfolio return.
- In 2007: DB and FB ownership types had significant relationships with loan portfolio return.
- In 2011: GB and FB ownership types had significant relationships with loan portfolio return.

Therefore, it can be concluded that bank ownership type had a significant relationship with loan portfolio return in the research period.

The positive coefficients of the GB dummy regressors indicate that the relationship between GBs and loan portfolio returns over time is greater than that of DBs. This finding contradicts Iannotta et al. (2007) and other studies reporting that government-owned banks under-perform other bank ownership types (La-Porta et al., 2002, Mian, 2003, Barth et al., 2004, Beck et al., 2004, Sapienza, 2004, Berger et al., 2005, Dinc, 2005, Micco and Panizza, 2006, Taboada, 2011). However, the contradiction between the findings of this research and prior contributions to the literature is difficult to explain. It was not possible to directly compare the empirical findings because previous studies use ROA and ROE as dependent variables, although the loan interest income used in this research contributes substantially to ROA and ROE figures.

The observation that bank ownership type is a determinant of bank loan portfolio returns is consistent with the findings of De-Haas et al. (2010). Sectoral loan concentration is also a significant variable, indicating that the more concentrated banks are, the lower their returns are. This finding contradicts those of Hayden et al. (2006), who report that diversification tends to reduce bank returns. The findings in the present study also contrast with those of Acharya et al. (2002) and Tabak et al. (2011a) that loan portfolio diversification has a negative effect on bank returns. The findings also are at odds with corporate finance theory, according to which banks should implement focus strategies to reduce agency problems and exploit their management expertise in certain sectors. Finally, the negative and significant relationship between GDP and loan portfolio return demonstrates the impact of movements in the business cycle on the portfolio return from market segments in which banks conduct business. The findings support Glen and Mondragon-Velez

(2011), who report that economic growth is the primary driver of loan portfolio performance.

6.4 Limitations of this Study

Although this study is the first to link bank ownership types and bank loan portfolios, limitations exist with regard to the measurement of variables and data availability.

- The application of the direct ownership approach used to classify banks is based on their percentage of government, foreign and domestic ownership structures to capture the shareholders' equity stakes (cash flow rights). This methodology is similar to that applied by Mian (2003), Magalhaes et al. (2010), and Claessens and Horen (2012). However, the indirect approach, which involves tracking ownership history to capture control rights, as applied by La-Porta et al. (2002) and Taboada (2011), could have provided different findings. However, the complexities and difficulties in obtaining the data, namely, ownership history in the latter approach, serve as major barriers to its implementation.
- In this study, loan interest income, as opposed to ROA and ROE, was employed as the dependent variable because it is considered to be more relevant measure of loan portfolio return. However, because other research has used ROA and ROE, the difference in these proxies for dependent return variables makes it difficult to compare the findings of this research with prior contributions.
- Information on the loan interest income and NPLs of the specific products or sectors to which banks provide loans can only be retrieved directly from banks, and as such, no secondary data sources exist for these data. In this research, no attempt was made to obtain any such information because of time limitations and the potential confidentiality of such operational information. However, the availability of such data would enable researchers to thoroughly compare the risk-return profiles and attitudes of all banks.
- Comparative research on bank ownership types, their loan portfolio composition, NPLs and portfolio return in other South East Asian countries such as Thailand, Singapore, Malaysia and the Philippines does not exist. The lack of such research makes it impossible to compare the findings in Indonesia with those in similar South East Asian countries.

6.5 Thesis Contribution and Recommendations

The findings of this thesis contribute to the literature in various ways. This thesis provides a longitudinal examination of the changes and differences in the loan portfolio composition, risk and performance of the commercial bank ownership types in Indonesia, a subject that has not previously been studied empirically. The thesis is based on bank-level information on the loan portfolio structure, risk and performance of Indonesian commercial banks obtained from their annual reports, as provided by Infobank Magazine, the library of the Indonesian Banking Development Institute and the banking directory provided by Bank Indonesia. This research examines the changes to and the differences in the loan portfolio structures, risk and performance of the different bank ownership types during the post-Asian crisis period (2003), at the onset of the global financial crisis (2007) and the post-global financial crisis period. Therefore, this research provides empirical evidence regarding changes in bank ownership loan portfolios, risk and performance in Indonesia from 2003 to 2011. The provision of longitudinal evidence on the loan portfolio structures of different bank ownership types is a major contribution of this thesis, as some prior studies (Acharya et al., 2002, Elyasiani and Deng, 2004) have focused only on single cross-sectional periods.

Because bank ownership type is one of the factors affecting Indonesian bank loan portfolios, it is important for Bank Indonesia to consider ownership differences when developing or revising credit regulations. Bank Indonesia's requirement for FBs to direct loans to specific sectors, as determined by regulation No. 14/8/PBI/2012 and circular letter No. 15/4/DPNP, already contribute to the development of different sectors (Bank Indonesia, 2012, Bank Indonesia, 2013b). However, such efforts could be enhanced by constructing similar requirements for other bank types. Evidence exists that GBs do not perform the role of "government agencies" in targeting specific market segments for economic development. Specific sectors that have infrastructural economic development liabilities, such as the electricity and transportation sectors, may require more direct financing from GBs as the major player in the banking industry. Thus, the trend among GBs to target the other (unspecified) sector, which primarily consists of consumers, should be reviewed more thoroughly. Greater reliance by GBs on financing consumption expenditures by

servicing this sector will not necessarily have a positive long-term effect on Indonesian economic growth. Focusing on sectors that contribute more to infrastructure and international trade may provide greater long-term economic success.

In addition to realigning the economic sectors on which banks focus, it may be worthwhile to consider bank loan re-allocation regulations based on regions. Within this context, government regulation restricts FB operations to provincial capitals. Future research could be conducted to determine what is required to ensure greater regional loan diversification to improve overall economic and sectoral development.

The findings indicate negative relationships between the concentration (EHHI) and loan portfolio returns of individual banks. Based on these findings, banks may consider actively applying diversification strategies to improve the performance of their loan portfolios.

To supplement this thesis, comparative research could also be conducted in other South East Asian countries such as Thailand, Singapore, Malaysia and the Philippines. Additional studies could provide useful information regarding the similarities and differences in bank types, their loan portfolios, and their risks and returns.

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APPENDIX A: List of Banks Selected as Sample

NO	CURRENT BANK NAME	PREVIOUS BANK NAME
1	PT BANK MANDIRI (PERSERO), Tbk	
2	PT BANK NEGARA INDONESIA (PERSERO), Tbk	
3	PT BANK RAKYAT INDOENSIA (PERSERO), Tbk	
4	PT BANK TABUNGAN NEGARA (PERSERO), Tbk	
5	PT BANK AGRIS	BANK FINCONESIA
6	PT BANK AGRONIAGA, Tbk	
7	PT BANK ANTAR DAERAH	
8	PT BANK ARTHA GRAHA INTERNASIONAL	BANK INTERPACIFIC
9	PT BANK BUKOPIN	
10	PT BANK BUMI ARTA, Tbk	
11	PT BANK CAPITAL INDONESIA	BANK CREDIT LYONNAIS INDONESIA
12	PT BANK CENTRAL ASIA, Tbk	
13	PT BANK CIMB NIAGA, Tbk	
14	PT BANK DANAMON INDONESIA, Tbk	
15	PT BANK EKONOMI RAHARJA, Tbk	
16	PT BANK GANESHA	
17	PT BANK HANA	BANK BINTANG MANUNGGAL
18	PT BANK ICBC BUMIPUTERA, Tbk	
19	PT BANK ICBC INDONESIA	BANK HALIM
20	PT BANK INTERNASIONAL INDONESIA, Tbk	
21	PT BANK MASPION INDONESIA	
22	PT BANK MAYAPADA INTERNATIONAL, Tbk	
23	PT BANK MEGA, Tbk	
24	PT BANK MESTIKA DHARMA	
25	PT BANK METRO EXPRESS	
26	PT BANK MUTIARA, Tbk	BANK CENTURY; BANK CIC
27	PT BANK NUSANTARA PARAHYANGAN, Tbk	
28	PT BANK OCBC NISP, Tbk	BANK NISP
29	PT PAN INDONESIA BANK, Tbk	
30	PT BANK PERMATA, Tbk	BANK BALI
31	PT BANK QNB KESAWAN, Tbk	
32	PT BANK HIMPUNAN SAUDARA 1906, Tbk	
33	PT BANK SBI INDONESIA	BANK INDOMONEX

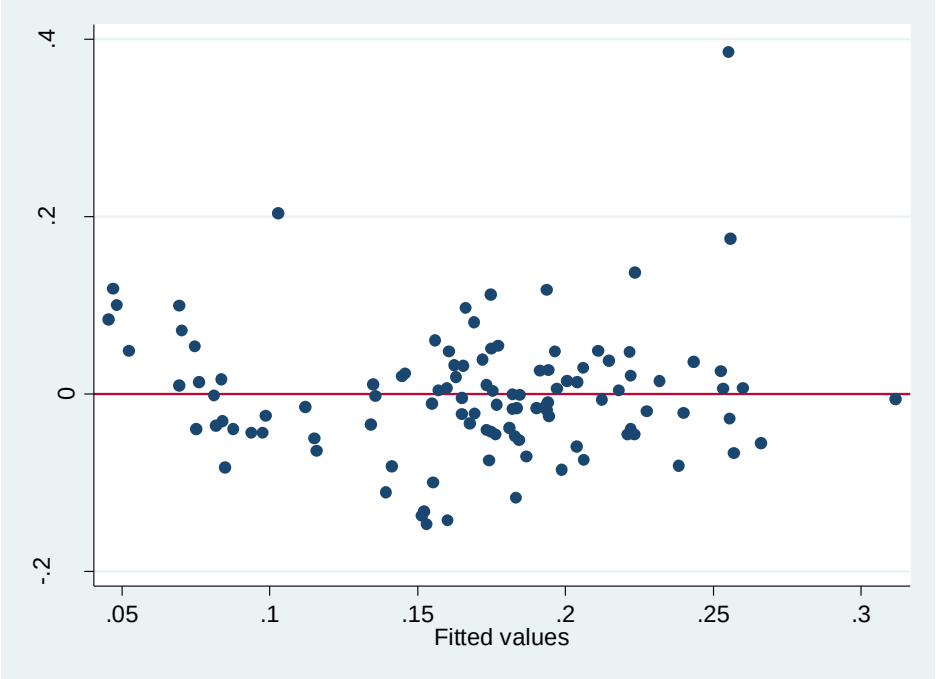
NO	CURRENT BANK NAME	PREVIOUS BANK NAME
34	PT BANK SINARMAS, Tbk	BANK SHINTA INDONESIA
35	PT BANK OF INDIA INDONESIA, Tbk	BANK SWADESI
36	PT BANK UOB INDONESIA	BANK UOB BUANA
37	PT BANK WINDU KENTJANA INTERNATIONAL, Tbk	BANK MULTICOR
38	PT ANGLOMAS INTERNATIONAL BANK	
39	PT BANK ANDARA	BANK SRI PARTHA
40	PT BANK ARTOS INDONESIA	
41	PT BANK BISNIS INTERNATIONAL	
42	PT BANK TABUNGAN PENSIUNAN NASIONAL, Tbk	
43	PT BANK FAMA INTERNASIONAL	
44	PT BANK HARDA INTERNASIONAL	
45	PT BANK INA PERDANA	
46	PT BANK INDEX SELINDO (BANK INDEX)	
47	PT BANK JASA JAKARTA	
48	PT BANK KESEJAHTERAAN EKONOMI	
49	PT BANK LIMAN INTERNATIONAL	
50	PT BANK MAYORA	
51	PT BANK MITRANIAGA	
52	PT BANK MULTI ARTA SENTOSA (MAS)	
53	PT BANK NATIONAL NOBU	BANK ALFINDO
54	PT BANK PUNDI INDONESIA, Tbk	BANK EKSEKUTIF INTERNASIONAL
55	PT BANK ROYAL INDONESIA	
56	PT BANK SAHABAT PURBA DANARTA	
57	PT BANK DIPO INTERNATIONAL	BANK SAHABAT SAMPOERNA
58	PT BANK SINAR HARAPAN BALI	
59	PT BANK VICTORIA INTERNATIONAL, Tbk	
60	PT BANK YUDHA BHAKTI	
61	PT CENTRATAMA NASIONAL BANK	
62	PT PRIMA MASTER BANK	
63	PT BPD BENGKULU	
64	PT BPD ACEH	
65	PT BPD BALI	
66	BPD YOGYAKARTA	
67	PD BPD KALIMANTAN SELATAN	
68	PT BPD DKI	
69	PT BPD JAWA BARAT DAN BANTEN	
70	PT BPD JAMBI	
71	PT BPD JATENG	
72	PT BPD JATIM	

NO	CURRENT BANK NAME	PREVIOUS BANK NAME
73	PT BPD KALBAR	
74	PT BPD KALTENG	
75	BPD KALIMANTAN TIMUR	
76	PT BPD LAMPUNG	
77	PT BPD MALUKU	
78	PT BPD NAGARI	
79	PT BPD NTB	
80	PT BPD NTT	
81	PT BPD PAPUA	
82	PT BPD RIAU KEPRI	
83	PT BPD SULAWESI SELATAN DAN SULAWESI BARAT	
84	PT BPD SULAWESI TENGAH	
85	PT BPD SULAWESI UTARA	
86	PT BPD SUMATERA SELATAN DAN BANGKA BELITUNG	
87	PT BPD SUMATERA UTARA	
88	BPD SULAWESI TENGGARA	
89	PT ANZ PANIN BANK	
90	PT BANK BNP PARIBAS INDONESIA	
91	PT BANK CHINATRUST INDONESIA	
92	PT BANK COMMONWEALTH	
93	PT BANK DBS INDONESIA	
94	PT BANK KEB INDONESIA	
95	PT BANK MIZUHO INDONESIA	
96	PT BANK RABOBANK INTERNATIONAL INDONESIA	
97	PT BANK RESONA PERDANIA	
98	PT BANK SUMITOMO MITSUI INDONESIA	
99	PT BANK WOORI INDONESIA	
100	THE BANGKOK BANK COMP. Ltd	
101	BANK OF AMERICA , NA	
102	BANK OF CHINA LIMITED	
103	CITIBANK NA	
104	DEUTSCHE BANK AG	
105	THE HONGKONG & SHANGHAI BC	
106	JP MORGAN CHASE BANK NA	
107	THE ROYAL BANK OF SCOTLAND	RBS ABN AMRO
108	STANDARD CHARTERED BANK	
109	THE BANK OF TOKYO MITSUBISHI UFJ Ltd	

APPENDIX B: Multiple Regression Model Validity: Normality of Residuals and Multicollinearity

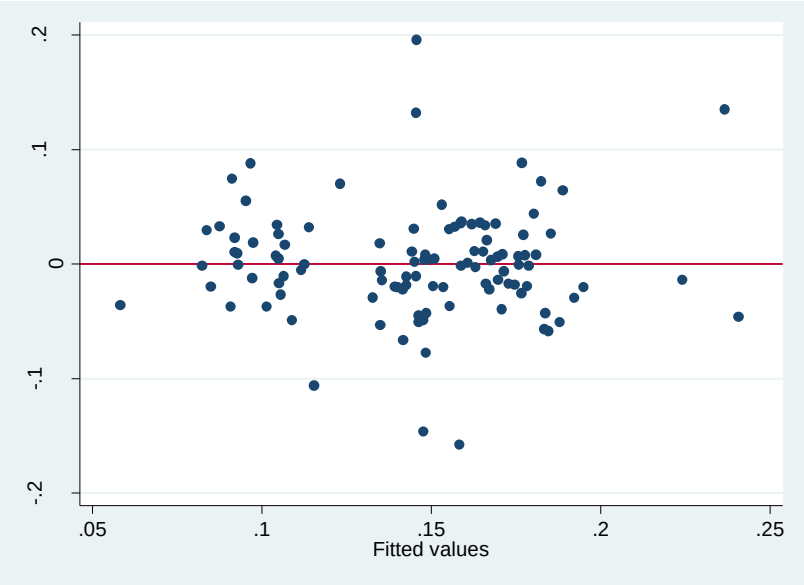
This appendix presents the residual scatterplot of loan portfolio return as the dependent variable and multicollinearity test result. In summary, the graphs display the plots of the residuals of LIntinc. The scatterplots of residuals against fitted values demonstrate that majority of the residuals of LIntinc fall between -2 and +2, thus providing evidence that the errors are normally distributed and the form of the models are corrected. The VIF and tolerance table shows that the value resides in an acceptable range (VIF less than 10 and tolerance more than 0.1). It indicates that multicollinearity does not pose a multiple regression problem.

Year 2003



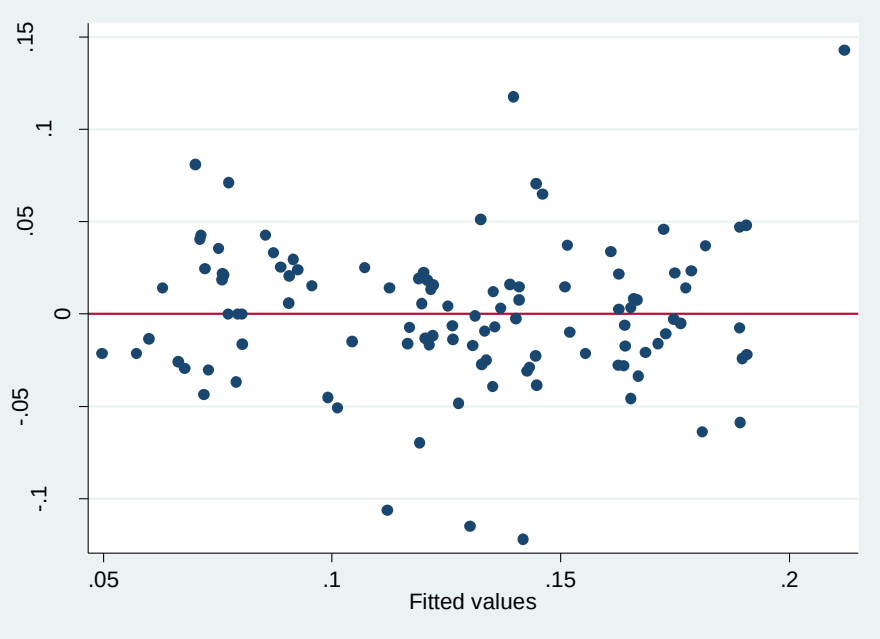
Variable	VIF	1/VIF
EHHI	1.89	0.530183
LnTA	1.84	0.543972
GB	1.73	0.578212
FB	1.67	0.598893
THHI	1.56	0.642783
EQUITY	1.5	0.665866
LQDT	1.17	0.855737
NPL	1.07	0.936883
Mean VIF	1.55	

Year 2007



Variable	VIF	1/VIF
GB	2.04	0.490682
LnTA	1.91	0.522279
EHHI	1.89	0.527829
FB	1.74	0.5745
THHI	1.59	0.627079
EQUITY	1.54	0.650867
LQDT	1.2	0.83163
NPL	1.11	0.899537
Mean VIF	1.63	

Year 2011



Variable	VIF	1/VIF
LnTA	3.79	0.264162
EQUITY	3.11	0.321578
EHHI	2.28	0.439197
THHI	2.1	0.476411
GB	1.98	0.504496
FB	1.95	0.511724
LQDT	1.27	0.787199
NPL	1.13	0.881207
Mean VIF	2.2	

F