# LOAN PORTFOLIO STRUCTURE AND PERFORMANCE OF GOVERNMENT-OWNED BANKS IN INDONESIA: DOES SIZE MATTER?

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**Abstract**

Government-owned banks represent the smallest number of banks in Indonesia (25% of all banks) but have a dominant market share of almost 50% in the loan market. Studies previous to this one do not address the effect of size differences on the loan portfolio structures and performance of such banks. The objective of this study is to add to the literature in this area by determining whether small and large Indonesian government-owned banks differ in terms of their loan portfolio structures and performance. The study covers the 2003 to 2011 period. Descriptive statistics, univariate statistics and generalized least squares estimation are applied. The findings show that the loan portfolio structures and returns of small and large government-owned banks differ significantly.

**Keywords:** Loan Portfolio, Government-Owned Banks, Indonesia

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## 1. Introduction

Government owned banks (GBs) play a prominent role as financial intermediaries in Indonesia. Data retrieved from the Bank Indonesia annual reports sourced from the Indonesian Banking Directory indicate that although representing just 25% of the overall number of banks in Indonesia, the GBs retained a dominant market share of almost 50% in the loan market over the period 2003 to 2011.

Over the 2003-2011 periods, GBs in Indonesia were the major loan providers. The total amount of loans provided by GBs in 2011 was almost three times as much as that of other domestic banks and nearly twice as much as that of foreign-owned Banks in Indonesia (Bank Indonesia, 2011). Therefore GBs dominate the Indonesian banking industry.

According to the Indonesian central bank classification, GBs comprise of state-owned banks (owned by central government) and regional development banks (owned by provincial/local governments). Table 1.1 shows that the state-owned banks are on average larger than regional development banks.

**Table 1.1** Asset size of Different Indonesian Banks - 2003 and 2011

| | December 2003 | | | | | December 2011 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Bank Ownership Group | < 1 Trillion Rp | 1-10 Trillion Rp | 10-50 Trillion Rp | > 50 Trillion Rp | Total | < 1 Trillion Rp | 1-10 Trillion Rp | 10-50 Trillion Rp | > 50 Trillion Rp | 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 Banks | 3 | 3 | 5 | 0 | 11 | 0 | 4 | 3 | 3 | 10 |
| Total | 59 | 58 | 16 | 5 | 138 | 13 | 57 | 32 | 18 | 120 |
| Percent of Total | 0,43 | 0,42 | 0,12 | 0,04 | 1,00 | 0,11 | 0,48 | 0,27 | 0,15 | 1,00 |

*Source: Indonesian Banking Statistics 2003 and 2011*

Using the means of all government banks as the cut-off (column 3, Table 1.2), the State-owned banks formed large GBs whereas on the contrary the regional development banks formed small GBs.

While previous studies highlight the weak performance of GBs compared to other bank ownership types (La-Porta et al. (2002), Barth et al. (2004), Sapienza (2004), Berger et al. (2005a) and Taboada (2011)), no such research distinguishes between the effect of size differences between GBs on their loan portfolios. The only retrieved previous research which finds that bank loan portfolios are determined by bank characteristics such as ownership and size was conducted by De-Haas et al. (2010). They did not specifically refer to GBs but indicated that large banks in general possess a comparative advantage in lending to large customers as they are able to exploit economies of scale in evaluating the "hard-information" borrowers. In contrast, small banks may not be able to lend to large borrowers because of size limitations and regulatory lending limit constraints. However, they are better at dealing with "soft information" borrowers such as consumers and small and medium size enterprises (SMEs).

**Table 1.2.** Means of Government-owned Banks Total Assets (In Million Rupiah)

| Year | State-owned Banks | Regional Development Banks | All GBs |
|---|---|---|---|
| 2003 | 125,000,000 | 2,586,841 | 18,900,000 |
| 2004 | 128,000,000 | 3,018,909 | 19,600,000 |
| 2005 | 138,000,000 | 4,060,576 | 22,000,000 |
| 2006 | 158,000,000 | 6,092,949 | 25,700,000 |
| 2007 | 181,000,000 | 6,484,202 | 29,800,000 |
| 2008 | 207,000,000 | 7,068,015 | 33,200,000 |
| 2009 | 242,000,000 | 7,616,221 | 38,900,000 |
| 2010 | 278,000,000 | 9,128,837 | 45,000,000 |
| 2011 | 331,000,000 | 11,600,000 | 54,200,000 |
| All Years | 198,000,000 | 6,405,776 | 31,900,000 |

The objective of this study was to use bank level information to determine the extent to which large and small GBs differ in terms of their loan portfolio composition, risk and performance.

Findings from this research show that the economic sector (EHHI) loan portfolio concentration of the large and small GBs differ over the total study period with small GBs being more concentrated, and showing an increase in concentration over the period 2003 to 2011. However, the loan types (THHI) portfolio concentration for all GB sizes are very similar and do not change much over the period 2003 to 2011. Small GBs have more focused loan portfolios but experience lower risk and higher return. These findings support the corporate finance theory, according to which banks should implement focus strategies to reduce agency problems and exploit their management expertise in certain sectors. The findings do not support the traditional banking and portfolio theory that banks should diversify their loan portfolio to reduce risk (Hayden et al., 2006).

## 2. Literature Review

Bank loan portfolio diversification strategies are based on the modern portfolio theory of Markowitz (1952), and largely followed by experts in financial institutions (Winton, 1999). According to the idiosyncratic risk hypothesis, diversification eliminates the specific (idiosyncratic) risk which enable banks to reduce their monitoring efforts and therefore lower their operating costs, which ceteris paribus should lead to higher cost efficiency (Rossi et al., 2009). Furthermore, the benefit of diversification stems from economies of scope across inter alia economic sectors and geographic areas (Laeven and Levine, 2007).

Researchers like Hayden et al. (2006), Berger et al.(2010) and Tabak et al. (2011) all indicate that risk reduction and performance improvement are advantages of diversification whilst agency problems are common associated disadvantages. Notwithstanding the aforementioned, Tabak et al. (2011) also indicates that diversification increases the risk in the Brazil and Italian banking sectors and reduces the performance of the banks in China, Germany and small European countries. This viewpoint, that diversification does not always reduce risks and improve returns, is also supported by other researchers like Winton (1999) and Acharya (2002).

Some of the regulations governing central banks like maximum lending limits that apply to banks, promote diversification, whilst other regulations pertaining to aspects like branching, entry, and asset investments often encourage focus strategies (Berger et al., 2010). However, the existence of regulations that instigate diversification may increase monitoring costs and reduce cost efficiency due to large numbers of individual customers and industries (Rossi et al., 2009). Furthermore, given that managers are risk averse, they may incur additional costs in their search for high quality loans to apply diversification. These factors may reduce diversification risk-return efficiency.

A focus strategy opposed to a loan portfolio diversification strategy is effective when banks face information asymmetry (Acharya et al., 2002), Kamp et al. (2005),Berger et al. (2010), Tabak et al. (2011)) and it serves as a contributing determinant of differences between banks in terms of their loan

concentration in sectors (Dell'Ariccia and Marquez, 2004). Re-allocation of loans (commonly known as flight to captivity) to sectors where greater adverse selection problems exist may happen when banks face mere intrinsic overall competition from other outside lenders entering the market. It means that more lenders may target borrowers in the same sectors subject to low information asymmetries. Therefore, existing informed lenders may have to deal with more captured (but also higher risk) borrowers that did not previously form part of their market in such sectors (Dell'Ariccia and Marquez, 2004)[1].

Bank size can be regarded as another determinant of bank loan portfolio composition. Researchers such as De-Haas et al. (2010) investigated bank size performance differences. Their findings show that bank size, bank ownership, and legislation that protect the rights of banks as creditors are important determinants of the loan portfolio compositions of banks. According to Carter et al. (2004) the lending performance of small banks may be better than that of large banks due to factors such as structure performance (SP), information advantage (IA), and relationship development (RD) theories. The SP theory relates to the industry or market structure in which banks operate. When operating in smaller markets with a limited number of competitors, small banks may experience higher interest income (Gilbert, 1984). The IA theory refers to the information accessibility and organisational structures of banks. Nakamura (1993, 1994) and Mester et al. (1999) point out those small banks have the advantage of credit information accessibility. Their flat organisational structures also allow better delegated borrower monitoring (Carter et al., 2004). Finally, the RD theory contrasts the relationship lending conducted by small banks using "soft information" about borrowers with arms-length lending by large banks using "hard information of borrowers (Berger et al., 2005b). Small banks have the advantage of serving the "soft information" borrowers due to their ability to maintain a close relationship with the borrowers.

Differences in the organisational structures and exposure to asymmetric information between small and large banks may result in different loan portfolio compositions (Degryse et al., 2012) and differences in lending technology and innovation capability (Berger et al., 2005a).

In view of the aforementioned characteristic differences between bank sizes that researchers identified, it is hypothesized that differences exist in the loan portfolio composition and loan repayment default risk of different sizes of GBs. As a result their returns may also differ.

[1] Flight to captivity implies that banks re-allocate their portfolio towards more captive borrowers when shocks to their balance sheet, or from their competitive environment, force them to alter their lending patterns

### *A Brief History of Government-owned Banks in Indonesia*

The major reform of the Indonesian banking industry commenced with the enactment of the Banking Act No 14/1967. One year after the reforms which started in 1967, seven separate government-owned banks were established, each governed by their own laws. They were established to develop specific sectors of the national economy[2] with specific segment allocation for each one.

Throughout the 1970s, banking was dominated by GBs. Although foreign bank branches established in 1968 still existed, the industry remained closed to new entries. As a result, GBs did not face competition from other banks (Bennet, 1999). They were often required by policy makers to direct their loans to certain customers. This was known as "memo lending" or "lending on the basis of a recommendation from a prominent or politically well-connected person" (Bennet, 1995). High officials of the GBs were appointed by senior politicians. Thus, to maintain the security of their jobs, they compromised bank loan portfolio quality. Memo lending resulted in improper loan assessment which led to providing loans to non-credible companies that did not have the ability to repay the loans. Further, McLeod (1996) reported that the lending policy of GBs targeted state enterprises that were obliged to rely on GBs, 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)). It was a mechanism according to which interest rate ceilings were allocated to different economic sectors. The Central Bank therefore directed the allocation of bank credit to different sectors (Chant and Pangestu, 1994).

During the period of the oil boom (1973-1982), the GBs enjoyed the supply of funds by the Central Bank at low interest rates. This made it possible for them to grant loans to economic sectors at a low rate. The mechanism was planned by the government to spread the income generated from oil to sectors targeted by the government. It enhanced the fulfilment of the social motives of government banks (McLeod, 1996).

After the sharp decline of oil prices (which generated the main Indonesian export income) in 1982, the government realized the need to create more efficient banking. The main objectives of the reform actions were to cease the subsidized lending program and to create a more market-oriented banking system. The reform process consisted of the termination of

[2] The specific sectors/activities served by each of the seven newly formed State-owned banks were: 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 saving bank, and Bapindo-national development bank (see: Bennet, 1990).

providing liquidity credit to GBs, removal of interest rate controls (as the consequence of the termination of the subsidized-lending program), and abandonment of lending controls (Mc Leod, 1996).

The intention with the abandonment of lending control was to enable GBs to take independent loan portfolio decisions based on their ability to attract deposits. It also pushed the GBs to compete with other banks since subsidised interest rates no longer existed. The Central Bank loans to GBs remained high (Mc Leod, 1996). There was little improvement in the efficiency of GBs and they maintained their focus on serving government-owned enterprises and neglected the retail markets (Cole and McLeod quoted in Mc Leod, 1996).

The bank reform package introduced by the Central Bank in October 1988, known as PAKTO 1988, relaxed many bank establishment regulations to foster competition in the banking industry. As a result, the Indonesian banking industry witnessed an accelerated increase in the number of banks. The private-owned banks were able to perform the intermediary functions better than government-owned banks. After the deregulations the GBs still engaged in politically motivated loans. In many of the cases, there were inadequate loan assessment (Bennet, 1999). GBs lent mostly to affiliated companies which led to high risk exposure arising from highly correlated risk between the bank and the borrowers, since they were all in the same corporate groups. They used various means to fund affiliated companies in excess of the lending limit regulations (Bennet, 1999).

The period since the implementation of the 1988 banking package, up to the 1997 Asian Financial Crisis, was characterised by the reduction of GB domination and market mechanisms were applied to set interest rates and loan allocations (Bennet, 1999). These mechanisms were mainly by way of the Banking Act (BL 7/ 1992) that was introduced in October 1992. Requirements for GBs and domestic-owned banks were made the same to create a more competitive banking industry. The legal status of GBs was transformed to limited liability companies to become private corporations (Pangestu, 2003). The Banking Act abolished the GBs obligations to allocate credit to support government projects (Harun, 2008). The extensive growth in the number of banks during this period of time also brought contemporary problems along. Most of the banks did not apply adequate risk management and engaged 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 NPLs of the largest GBs reached 21 percent of total loans (Bennet, 1999). There were no deposit insurance schemes in Indonesia at that time. The Central Bank performed the function of lender of last resort and protected the large government-owned banks under the "too-big to fail" policy.

The closure of sixteen banks in November 1997 marked the commencement of the Indonesian banking crisis. The restructuring of the banking sector (November 1997-2000) took the form of bank liquidations; bank mergers; bank close-downs; and bank re-capitalization at a huge cost to the government (Alijoyo et al. (2004) and Batunanggar (2002)). The number of government-owned and private-owned banks reduced. Some of the former domestic-owned banks temporarily became government-owned banks but the government's shares in those banks were sold off again during 2000-2002 period (Sato, 2005).

## 3. Research Methodology

### *3.1 Sample, Types and Sources of Data*

All Indonesian GBs (4 large GBs and 26 small GBs) that operated over the 2003 to 2011 period were included in this research. This constitutes a total observation of 270 (30 banks for 9 years). One large bank (Bank Ekspor Indonesia) that only existed for a part of the research period (from August 1999 to 1 September 2009) was excluded. This research utilised secondary data from The Indonesian Central Bank Library, Infobank magazine and the library of The Indonesian Banking Development Institute (LPPI). The central bank library provides individual bank ownership data and financial statements whereas Infobank magazine provides loan allocation data based on loan types and economic sectors. Information from LPPI also supplements loan allocation data not provided by Infobank magazine.

### *3.2 Variable Definition and Measurement*

Table 3.1 reflects all the variables, their definitions and how they are measured.

**Table 3.1.** Variables Definition and Measurement

| | Variable | Definition | Measurement | Remarks |
|---|---|---|---|---|
| 1 | Loan Portfolio Concentration (CONC) | 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= Hirschman Herfindahl Index<br>Q= $\sum_{i=1}^{10} p_i$<br>$pi$ = the percentage of credit to each sector<br>$N$ = 10 for E-HHI and 3 for THHI |
| 2 | Loan Portfolio Payment Default Risk (RISK) | A different risk inherent to each industry, region or product of a bank(Cronje, 2013) | (Substandard+ Doubtful+Loss)/Total Loans | |
| 3 | Loan Portfolio Return (RETR) | The net income obtained from bank's loan portfolio | Gross Interest Income/ Total Loans | |
| 4 | 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 |
| 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 |

The dependent variable in this research is the loan portfolio return of GBs measured by the ratio of gross interest income to total loans. Three independent variables are used: bank size, loan portfolio concentration and loan repayment default risk. Interest rate and GDP serve as the macroeconomic variables. Banks are categorised into two size groups, being large state-owned banks, and small regional development banks. The categories were established by using the means of all government-owned banks as a cut-off point, with dummy variables (1 for large GBs and 0 otherwise) to identify the two sizes. The loan portfolio concentration was measured using the Hirschman Herfindahl Index (HHI). It was also used by Winton (1999), Acharya et al. (2002) and Hayden et al. (2006).3 For this research, two types of HHI's are applied, namely Economic Sector HHI (E-HHI) and Loan Type HHI (T-HHI). The loan repayment default risk is measured by the ratio of non-performing loans (NPLs) to total loans.

### *3.3 Data Analysis*

All research data is numerical, therefore quantitative data analysis was undertaken. Firstly, descriptive statistics of the variables (means and standard deviations) were calculated to determine data tendency and deviations. Secondly, univariate statistics in the form of the test of mean were used to find the differences in loan portfolio composition, risk and return of small and large GBs. The Mann-Whitney non-parametric test was applied since the data was not normally distributed. Thirdly, to determine the impact of bank size, loan portfolio composition and loan repayment default on portfolio returns, the following panel data regression equation was used:

$$Return_{it} = \alpha + \beta SIZE_{it} + \lambda EHHI_{it} + \gamma THHI_{it} + \zeta NPL_{it} + \delta MACRO_t + \varepsilon_{it} \quad (3.1)$$

Where:

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

$SIZE_{it}$ = size dummy

$EHHI_{it}$ = economic sector loan portfolio concentration

$THHI_{it}$ = loan type portfolio concentration

$NPL_{it}$ = loan portfolio default payment risk for bank i at year t

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

$\varepsilon_{it}$ = the disturbance term.

This research employs the feasible generalized least squares (FGLS) estimation in the panel data regression since independent variable collinearity was verified. FGLS allows for heteroskedasticity and has two unique features: modelling of cross-sectional correlation and first order autocorrelation.

## 4. Findings

### *Descriptive Statistics*

Table 4.1 details the summary statistics for the variables in the equation 3.1. The first part presents the descriptive statistics regarding loan allocation based on economic sectors and loan types. The variation for loans allocated to each sector (standard

[3] The Indonesian economic sectors to which banks can lend are 10. Central bank classification 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; others. The loan types are three, namely: working capital, investment, and consumption.

deviation of EHHI) is higher than that for loan types. The standard deviation for loan allocation to each sector is higher than that of loan types. The average gross NPL percentage of small GBs of 2.314% is low in contrast to the average gross NPL percentage of large GBs of 5.332%. By analyzing the mean and the standard deviation of HHI as concentration measure, it can be seen that loan portfolios based on economic sectors are less concentrated than portfolios based on loan types for both small and large GBs. It cannot be compared directly since there are only three loan types compared to the ten different identified economic sectors. However, both measures show that overall the large GBs loan portfolios seem to be more diversified than that of the small GBs.

Table 4.1 shows that although small GBs have the highest concentration risk based on sectors and loan types, they have lower loan repayment default risk and higher returns. As stated by Deutsche Bundesbank (2006), focusing on specific segments may create concentration risk but as long as the targeted sector consists of high quality borrowers with low intrinsic risk, it may result in high return. As the small GBs focus on consumer loans with many direct salary deductions for loan repayments (see Figure 4.5), the associated payment default risk is low. Consumer loans provide small GBs with high return since the interest rate earned from this segment is, based on data from Indonesian Statistics Bureau (www.bps.go.id), approximately 1.5-2 % higher than that of other types of financing.

**Table 4.1** Descriptive Statistics of Research Variables

| Variables | Large GBs (N=36) | | Small GBs (N=234) | |
|---|---|---|---|---|
| | Mean | Std. Dev | Mean | Std. Dev |
| I. LOAN PORTFOLIO STRUCTURE: COMPOSITION | | | | |
| Based on Economic Sectors: | | | | |
| Agriculture | 0.068191 | 0.052665 | 0.034942 | 0.068018 |
| Mining | 0.022139 | 0.024522 | 0.001965 | 0.006945 |
| Manufacturing | 0.180098 | 0.144999 | 0.010324 | 0.013830 |
| Electricity, Gas and Water | 0.018893 | 0.018663 | 0.005794 | 0.029015 |
| Constructions | 0.148913 | 0.302377 | 0.055674 | 0.070526 |
| Trade, hotel, and restaurants | 0.159366 | 0.115836 | 0.115937 | 0.104866 |
| Transportation and Communication | 0.029779 | 0.027212 | 0.009723 | 0.015698 |
| Business Services | 0.056795 | 0.037919 | 0.045757 | 0.113680 |
| Social Services | 0.008278 | 0.009092 | 0.026857 | 0.099949 |
| Others | 0.307548 | 0.281297 | 0.693029 | 0.228094 |
| Based on Loan Types: | | | | |
| Working Capital | 0.452313 | 0.224230 | 0.193315 | 0.150502 |
| Investment | 0.195630 | 0.150543 | 0.085162 | 0.088688 |
| Consumption | 0.352057 | 0.319355 | 0.721523 | 0.205866 |
| II. LOAN PORTFOLIO STRUCTURE: CONCENTRATION | | | | |
| By Economic Sector (EHHI) | 0.389398 | 0.321598 | 0.597555 | 0.206989 |
| By Loan Types (THHI) | 0.536872 | 0.174982 | 0.637804 | 0.178287 |
| III. LOAN PORTFOLIO RISK | | | | |
| Payment Default Risk (RISK) | 0.053319 | 0.044656 | 0.023141 | 0.022903 |
| IV. RETURN (RETR) | | | | |
| Gross Interest Income Ratio | 0.190357 | 0.055973 | 0.236316 | 0.093927 |

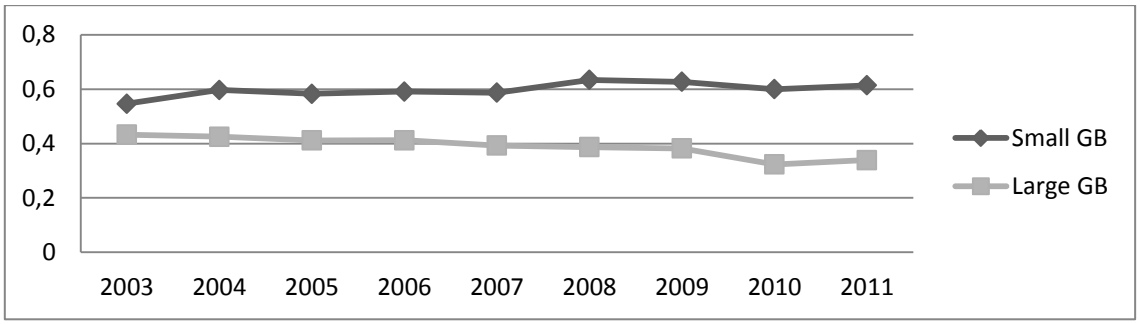
### *Loan Portfolio Concentration and Composition: Small and Large Government-owned Banks*

Loan Portfolio concentration that represents the extent to which banks apply and focus on loan diversification is measured by the Herfindahl-Hirschman Index (HHI). The loan portfolio concentration of small and large GBs based on economic sectors (EHHI) and loan types (THHI) is graphically depicted in Figures 4.1 and 4.2.

### *Economic Sector Bank Loan Portfolio Concentration (EHHI)*

Differences exist between the EHHI of small and large GBs with small GBs being the most concentrated and showing an increase in concentration over the period 2003 to 2011. In contrast, the EHHI concentration levels of large GBs tend to decrease over the research period (Figure 4.1). These findings indicate the overall tendency of large GBs to move towards a more diversified loan portfolio composition.

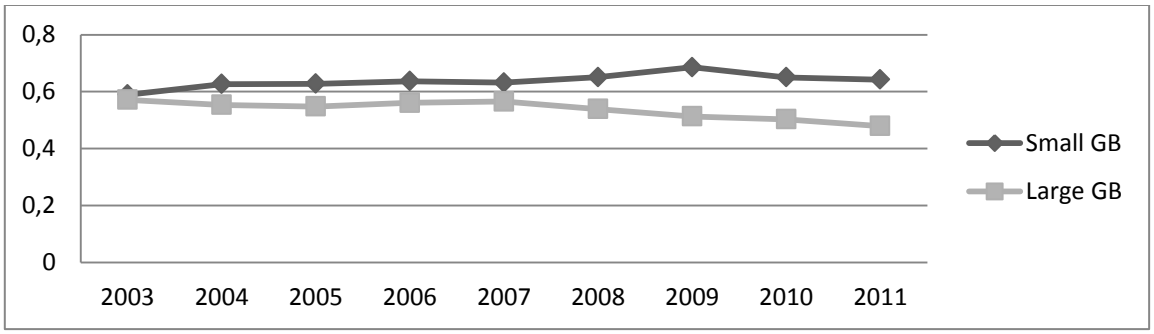
**Figure 4.1** Loan Portfolio Concentration Based on Economic Sectors: Small and Large Government-owned Banks




### *Loan Type (THHI) Bank Loan Portfolio Concentration*

The average loan type concentration levels (THHI) of small and large GBs are depicted in Figure 4.2. From 2003 to 2007, the THHI levels of both small and large GBs are very similar and do not change much. It is only from 2008 onwards that the concentration levels show definite changes. Small GBs tend to become more concentrated whilst the loan portfolios of large GBs become more diversified.

**Figure 4.2** Loan Portfolio Concentration Based on Loan Types: Small and Large Government-owned Banks



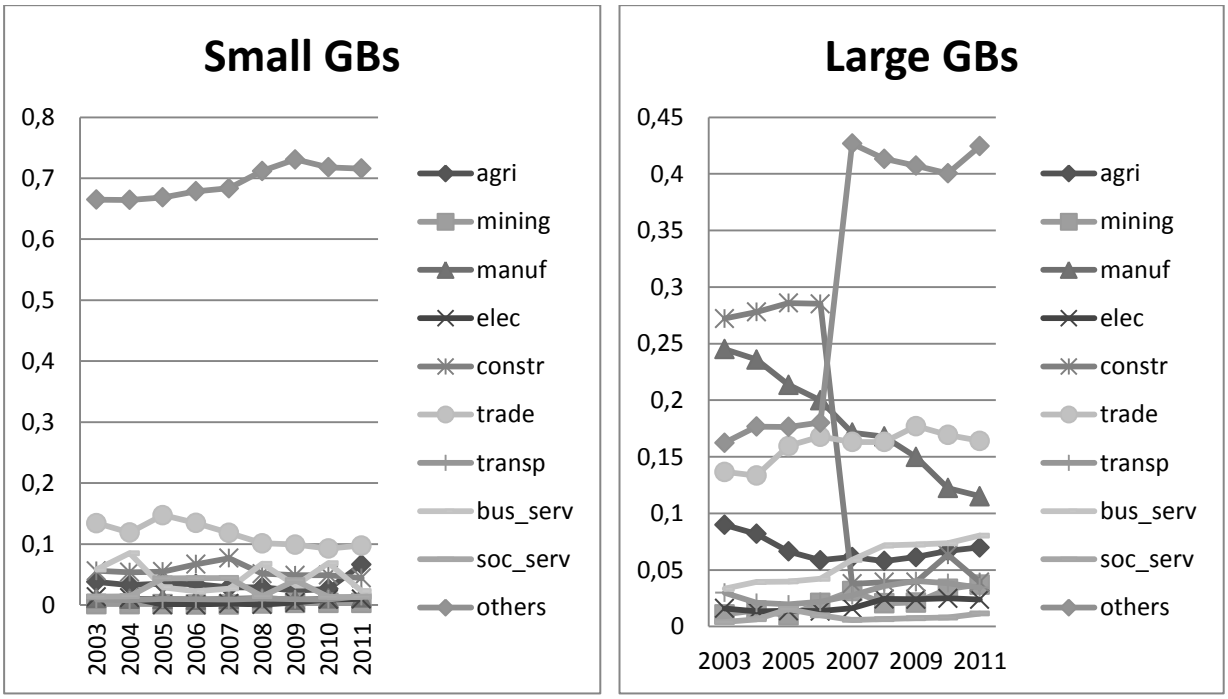

### *Loan Portfolio Composition: Small and Large Government-owned Banks*

In terms of loan allocation, small GBs are the major players in providing loans to unspecify others (last category of the economic sectors that primarily refers to consumers).

Consumer loans represent the majority of small GB loans with only a very small portion of loans allocated for working capital and investments. Large GBs become more involved in financing different business sectors with working capital becoming their most prominent type of finance as confirmed in Figure 4.5.

These findings serve as a good indicator that regional development banks (small in size) and state-owned banks (large in size) differ in their market segment and product type focus.

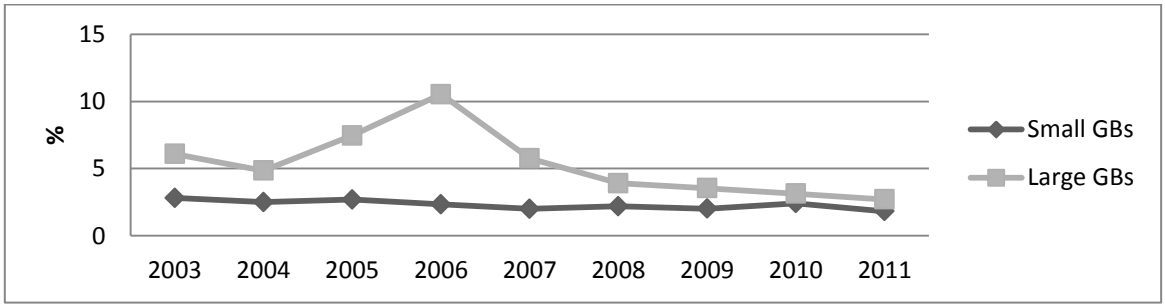
**Figure 4.3** Percentage Loan Portfolio Allocation to Different Economic Sectors for Small vs Large Government-owned Banks




### *Loan Portfolio Performance (Risk and Return) of Large vs Small Government-owned Banks*

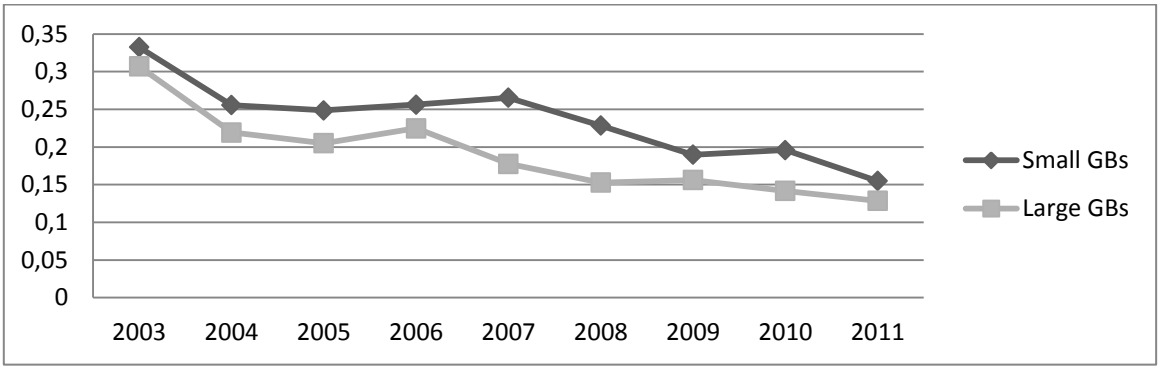
According to Cronje (2013) loan portfolio risks are classified into two broad categories namely intrinsic, and concentration risk. Within the context of this study intrinsic risk refers to the risk inherent to each sector, and each loan type of a bank. Intrinsic risk cannot be measured in this study since comparative risk information like loan defaults for each sector and each loan type is not available. Only loan repayment default information, provided in the form of NPLs for the total loan portfolio is available for individual banks and is used as proxy of overall bank loan portfolio risk. In this research, the ratio of gross NPLs to Total Loans (TLs) is used as the proxy for loan repayment default risk (See Figure 4.7). The higher the NPL percentage, the higher the loan portfolio risk.

**Figure 4.7** Loan Repayment Default o Risk of Small and Large Government-owned Banks for the period 2003 to 2011




The NPLs of the small and large GBs differs the most from each other in 2006, but the differences decrease with minor NPL differences remaining in 2011. The gross NPLs of large GBs are higher than that of the small GBs over the entire period. It is interesting to note that the NPLs of large GBs spike in 2005 and 2006 (prior to the GFC) whilst after the commencement of the GFC it decreased every year. On the other hand, small GBs experience a decrease in gross NPLs over the total study period with no increase associated with the GFC. Overall, (except for the 2005 and 2006 spikes in the NPLs of large GBs) the NPLs for both the small and large banks show a decreasing trend from 2003 to 2011. It indicates that the overall credit risk of banks decreases and that the quality of their loan portfolios improved over the nine-year study period.

**Figure 4.8** Loan Portfolio Return of Small and Large Government-owned Banks




To measure the loan portfolio return, the ratio of gross interest income to total loans is used in this research since in the broader sense it reflects the comparative pricing applied by banks. The ratio of gross interest income to total loans, after loan repayment defaults, constitutes the actual achieved return.

Figure 4.8 depicts the gross interest income ratios for small and large GBs over the period 2003-2011. In general, both small and large GBs experience a downward trend in their gross interest income from 2003 to 2011. This is due to changes in the central bank interest rate (*Central bank rate serves as the reference rate since 2005, hence no data available prior to 2005*) (from 12.75% in 2005 to 6% in 2011). It affects all banks but notwithstanding such changes, banks still apply different rates based on inter alia their specific market segments and supply and demand for the loans that they provide. Small GBs show the highest gross interest income in all years. Considering this situation, small GBs in general have a higher average return than large GBs over the nine year research period. The result is in line with the findings of Carter et al. (2004) that small banks earn higher returns than large banks due to their performance structure, information advantage and development of relationships with customers. However, the findings of Carter et al. (2004) is based on the risk adjusted yield of return whereas this research uses the gross interest income to total loans ratio.

### *Differences in the Loan Portfolio Structure and Performance of Small and Large Government-owned Banks*

Table 4.2 displays the results of the Mann-Whitney test performed to verify the descriptive statistics findings presented in the previous section of this paper with regard to the differences in the loan portfolio structure and performance of small and large GBs.

The Mann-Whitney test shows that there are statistically significant differences in the EHHI and THHI loan portfolio concentration and in the loan portfolio performance (risk and return) of small and large GBs. It therefore confirms that size does matter in explaining the loan portfolio structures and the performance of GBs in Indonesia.

**Table 4.2** Univariate Statistics for the Loan Portfolio Structure and Performance of Small and Large Government-owned Banks

| | Large Banks (n=36) | Small Banks (n=234) | Difference | Mann-Whitney Test | |
|---|---|---|---|---|---|
| | | | | Z | Prob> Z |
| EHHI | 0.3894 | 0.5976 | -0.2082*** | 4.78 | 0.0000 |
| THHI | 0.5369 | 0.6378 | -0.1009*** | 3.373 | 0.0007 |
| Risk | 5.3319 | 2.3141 | 3.0179*** | -6.368 | 0.0000 |
| Return | 0.1904 | 0.2363 | -0.0459*** | 3.959 | 0.0001 |

*Legend: The Mann-Whitney tests are conducted for testing the loan portfolio structure and performance median differences between the small and large GBs over the nine-year study period. Statistically significant differences at 1%, 5%, and 10% significance levels are respectively indicated by ***, **, and *.*

## 5. Empirical Results

Table 4.3 presents the FGLS used to determine the relationship between GB sizes, their EHHI and THHI loan portfolio concentration levels and their loan repayment default risk (loan portfolio risk) with their loan portfolio returns.

**Table 4.3** FGLS: Relationship between Bank Size; Loan Portfolio Structures; and Loan Portfolio Risk with Loan Portfolio Return

| | | Loan Portfolio Return |
|---|---|---|
| CONSTANT | Coefficient | 0.5894*** |
| | z-Statistic | 10.52 |
| | P-value | 0.000 |
| SIZE | Coefficient | -0.0555*** |
| | z-Statistic | -3.59 |
| | P-value | 0.000 |
| EHHI | Coefficient | -0.0330 |
| | z-Statistic | -0.75 |
| | P-value | 0.454 |
| THHI | Coefficient | 0.0145 |
| | z-Statistic | 0.26 |
| | P-value | 0.796 |
| NPL | Coefficient | 0.0014 |
| | z-Statistic | 0.76 |
| | P-value | 0.447 |
| INT.RATE | Coefficient | -0.0020 |
| | z-Statistic | -0.81 |
| | P-value | 0.421 |
| GDP | Coefficient | 0.0000*** |
| | z-Statistic | -8.50 |
| | P-value | 0.000 |
| Number of observations | | 270 |
| Number of banks | | 30 |

*Legend: This table present the FGLS of equation 3.1. The dependent variable is Loan Portfolio Return (Gross Interest Income - Intinc). The independent variables are bank sizes (small and large GBs), loan portfolio concentration based on economic sector (EHHI) and based on loan types (THHI), and loan repayment default (NPL), interest rate and GDP.*

*The table contains coefficients, z-statistics and P-values from FGLS regression with year dummy. Definitions of variables are provided in Table 3.1. ***, **, and * respectively correspond to 1%, 5%, and 10% significance levels.*

Table 4.3 shows that Size and GDP significantly affect loan portfolio returns. The negative coefficients of the size dummy regressors show that the relationship of large GBs with loan portfolio returns is less than that of small GBs. The 1% statistical significance of the size coefficient provides evidence that the size of GBs does affect loan portfolio returns. The estimation result also support the previous descriptive analysis which shows that the loan portfolio returns of small GBs are better than that of large GBs. Finally, the positive and significant relationship between GDP and loan portfolio return represents the impact of economic cycles on the portfolio return from market segments that banks conduct business with.

## Conclusions

Previous research like that of De-Haas et al. (2010) indicates that bank size is one of the bank loan portfolio determinants, as it may affect the market segment focus of banks. This paper attempts to determine whether large and small GBs differ in terms of their loan portfolio composition, risk and performance.

The findings support the hypotheses that small and large GBs differ with regard to loan portfolio composition, risk and return. The loan portfolios of small GBs are more concentrated with focus on the consumer sector whereas large GBs have more diversified loan portfolios with more exposure to the trade and manufacturing sectors although a high level of concentration in the consumer sector started in 2007. The prominent consumer sector exposure do not support findings of previous research like Mian (2003) that indicate the role of GBs to be primarily for financing or subsidizing of social projects. This is not surprising since the legal status of GBs was transformed to limited liability private companies with the introduction of the Banking Act BL 7/ 1992 in October 1992. Regulations for government-owned banks and private-owned domestic banks were aligned to create a more competitive banking industry (Pangestu, 2003). Furthermore, after the implementation of the 1992 Banking Act, GBs were no longer forced to allocate credit to support government projects. Considering these legislation changes large GBs became more involved in financing different business sectors with working capital becoming their most prominent type of loans compared to the consumer loans of the small GBs. However, since 2007 large GBs also entered the consumer loan market extensively due to the fact that it is a higher priced and safer market segment.

The gross NPLs of large GBs is higher than that of the small GBs over the entire period but overall, (except for the 2005 and 2006 spikes in the the NPLs of large GBs) the NPLs for both the small and large banks show a decreasing trend from 2003 to 2011. Regulation PBI 2/11/PBI/2000 jo PBI 15/2/PBI/2013 of the Central Bank that implemented a 5% standard for the net NPL ratio of banks may have prompted all GBs to adjust their credit risk assessment and/ or qualifying criteria for loans. The decrease in the overall NPLs of Indonesian banks may also result from the prudential regulations like productive asset quality, loan loss provision, and loan restructuring enacted by the Central Bank since 2003 (Indonesian Banking Booklet, 2003 and 2011). On the other hand, it may also be complimented by external economic factors not researched in this study.

Differences in the loan portfolio composition and concentration risk of GBs result in different loan portfolio returns. Small GBs show a higher loan portfolio return compared to the large GBs. Focusing on segments with low intrinsic risk provides small GBs with a better return. The findings support the corporate finance theory according to which banks should implement focus strategies to reduce agency problems and exploit their management expertise in certain sectors. The findings do not support the traditional banking and portfolio theory according to which banks should diversify their loan portfolio to reduce risk (Hayden et al., 2006).

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