DOES SIZE AFFECT LOAN PORTFOLIO STRUCTURE AND PERFORMANCE OF DOMESTIC-OWNED BANKS IN INDONESIA?

Apriani D.R Atahau*, Tom Cronje**

Abstract

Domestic-owned banks (DBs) represent almost 40% of the overall number of banks in Indonesia. The objective of this study is to determine whether small and large Indonesian DBs differ in terms of their loan portfolio structures and performance. No previous studies addressed this issue. The study is based on 9 year loan portfolio structure and performance data of 69 large and 346 small Indonesian DBs. Descriptive statistics, univariate statistics and panel data regression are applied. The findings from univariate statistics show that the loan portfolio structures and returns of small and large DBs differ significantly. However, panel data regression shows that only the loan portfolio return-risk relationship of small and large DBs differs significantly***.

Keywords: Domestic-owned Banks, Indonesia, Loan Portfolio Structures, Loan Portfolio Performance

*Satya Wacana Christian University, Salatiga.
** School of Economics and Finance, Curtin Business School, Curtin University, Australia, GPO Box U1987 Perth, Western Australia
Tel: +61 8 9266 3416
Fax: +61 8 9266 3026

1 Introduction

Domestic-owned banks (DBs) represent the largest number of banks in the Indonesian banking industry. Data retrieved from the Bank Indonesia annual reports and sourced from the Indonesian Banking Directory indicate that DBs represent almost 40% of the overall number of banks in Indonesia.

While previous studies compare different bank types like DBs with Foreign Banks (FBs) (Bonin et al., 2005, Detragiache et al., 2008, Taboada, 2011), such research does not consider the effect of size differences of banks on their performance and loan portfolios. The only previous studies that considered the size differences of banks were conducted by De Haas et al. (2010) and Atahau and Cronje (2014). The research conducted by De-Haas et al. (2010) focused on bank characteristics, such as ownership and size. They do not specifically refer to DBs but indicate 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, but they are better in dealing with "soft information" borrowers such as consumers and small and medium size enterprises (SMEs). Atahau and Cronje (2014) studied the effect of size difference on the loan portfolio structure and performance of government-owned banks and they found that the loan portfolio structures and returns of small and large government-owned banks differ significantly.

The objective of this study is to use bank level information to determine the extent to which large and small DBs differ in terms of their loan portfolio structures (composition and concentration), risk and performance.

Findings from this research show that the economic sector (EHHI) loan portfolio concentration of large and small DBs differ over the total study period with small DBs being more concentrated. Small DBs have more focused loan portfolios but experience slightly higher 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

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, circumstances exist where risk is minimised by selecting high-quality individual loans with low default rate (Deutsche Bundesbank, 2006). Conversely, diversifying portfolios, according to the modern portfolio theory, to consist of a combination of loan transactions with low correlations reduces the credit risk of a portfolio (but also the return), similar to stock and bond portfolios.

A focus 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 sectoral loan concentration differences between banks (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 increasing overall competition from other outside lenders entering the same sectors which are 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 those sectors (Dell'Ariccia and Marquez, 2004)[3].

Bank loan portfolio diversification strategies opposed to focus strategies are based on the modern portfolio theory of Markowitz (1952), and largely followed in financial institutions (Winton, 1999). According to the idiosyncratic risk hypothesis, diversification eliminates the specific (idiosyncratic) risk and enable banks to reduce their monitoring efforts and the operating costs resulting from it, 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).

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. 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.

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 (Atahau and Cronje, 2014). In contradiction to 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).

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

Some central bank regulations like maximum lending limits that apply to banks may promote diversification, whilst other regulations pertaining to aspects like branching, entry, and asset investments often encourage focus strategies (Berger et al., 2010). However, 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.

Another determinant of bank loan portfolio composition is bank size. According to De-Haas et al. (2010) bank size, bank ownership, and legislation that protect the rights of banks as creditors are important determinants of the loan portfolio compositions of banks. Carter et al. (2004) find that 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

---

[3] 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

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 that 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 (Atahau and Cronje, 2014).

The organisational structures and exposure to asymmetric information difference 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).

Based on the characteristic differences between bank sizes that researchers identified, it is hypothesized that differences exist in the loan portfolio composition, loan repayment default risk and returns of different sizes of DBs.

2.1 A brief history of domestic-owned banks in Indonesia

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[4]. 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. (Pangestu, 2003). These domestic-owned banks were

able to perform intermediary functions better than government-owned banks. 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 (Bennet, 1999). Concentration existed in bank sizes. 75% of total bank assets were held by 16 banks, including 10 non-government-owned domestic banks and 6 government-owned banks (Pangestu, 2003). Banking Act No. 7/1992 limited bank lending activities by imposing new maximum lending limits. Capital requirements were increased for the establishment of new domestic banks in October 1992 (Republik Indonesia, 1992) in an effort to temper the increase in bank numbers (Pangestu, 2003). 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 condition exerted further pressure on small domestic-owned banks as customer confidence in the small banks deteriorated. (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)[5], 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)).

3 Research methodology

3.1 Sample, types and sources of data

All Indonesian DBs that operated over the 2003 to 2011 period were included in this research. This constitutes a total observation of 415. The mean of total assets is used as the cut-off point of bank size which resulted in 69 observations of large DBs and 346 observations of small DBs for 9 years. 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 and loan interest income not provided by Infobank magazine.

---

[4] 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.

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

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 $Q = \sum_{i=1}^{10} p_i$ pi = the percentage of credit to each sector 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	Loan Interest Income/ Average 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
6	Equity Ratio (EQTY)	Book value of shareholder funds (Hogan et al., 2004)	Total Equity/Total Assets	
7	Liquidity Ratio (LQDT)	Ability to convert an assets into cash readily (Hogan et al., 2004)	Total Loans/Total Deposits	

The dependent variable in this research is the loan portfolio return of DBs measured by the ratio of loan interest income to average 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. The control variables representing bank-specific characteristics in this study are: bank equity and bank liquidity. Bank equity is measured by the ratio of Total Equity to Total Assets and the liqudity is measured by the ratio of Total Loans to Total Deposits. Banks are categorised into two groups based on size namely large DBs and small DBs. The categories were established by using the means of all domestic-owned banks as a cut-off point, with dummy variables (1 for large DBs 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)[6]. 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

---

[6] 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.

find the differences in loan portfolio composition, risk and return of small and large DBs. 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:

$$Return_{it} = \alpha + \beta SIZE_{it} + \lambda EHHI_{it} + \gamma THHI_{it} + \zeta NPL_{it} + \delta MACRO_t + \partial CONTROLS_{it} + \varepsilon_{it} \; ....(1)$$

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
$MACRO_t$ = macroeconomic variables year t
$CONTROLS_{it}$ = control variables for bank i at year t
NPL_{it} = loan portfolio default payment risk for bank i at year t
$\alpha, \beta, \gamma, \zeta$ = regression coefficients; and
ε_{it} = the disturbance term

This was followed by a re-run of the panel data regression to capture the interaction effect of size and loan portfolio concentration and risk.

This research employed fixed-effect panel data regression since the Breusch & Pagan Lagrangian Multiplier test showed the rejection of the null hypothesis of pooled OLS. In addition the Hausman test showed a significant P-value, which means fixed effects should be used instead of the random effect model (The Hausman test assessed the null hypothesis that the coefficients estimated by the efficient random effects estimator are the same as the ones estimated by the consistent fixed effects estimator).

4 Findings

4.1 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 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 DBs of 3.65% is slightly higher than the average gross NPL percentage of large DBs of 3.56%. 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 DBs. 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 loan portfolios of large DBs seem to be more diversified than that of the small DBs.

Table 4.1 shows that although small DBs have the highest concentration risk based on sectors and loan types, they have slightly higher loan repayment default risk and higher returns. Focusing on specific segments may create concentration risk, as stated by

determine the impact of bank size, loan portfolio composition and loan repayment default on portfolio returns, the following panel data regression equation was used:

Deutsche Bundesbank (2006). Based on risk-return relationship, higher risk may result in higher return.

4.1.1 Loan Portfolio Concentration and Composition: Small and Large Domestic-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 DBs based on economic sectors (EHHI) and loan types (THHI) is graphically depicted in Figures 4.1 and 4.2.

4.1.1.1 Economic Sector Bank Loan Portfolio Concentration (EHHI)

Differences exist between the EHHI of small and large DBs with small DBs being the most concentrated and showing a decrease in concentration over the period 2003 to 2011. In contrast, the EHHI concentration levels of large DBs tend to be more fluctuated over the research period (Figure 4.1).

4.1.1.2 Loan Type (THHI) Bank Loan Portfolio Concentration

The average loan type concentration levels (THHI) of small and large DBs are depicted in Figure 4.2. From 2003 to 2011, the THHI levels of both small and large DBs show a tendency to increase diversification.

4.1.1.3 Loan Portfolio Composition: Small and Large Domestic-owned Banks

In terms of loan allocation, small DBs are the major players in providing loans to trade and unspecified others (last category of the economic sectors that primarily refers to consumers). The exposures to these sectors are volatile and change significantly from year to year. Loan allocation to these two sectors dominate the loan portfolio composition of small DBs with exposures ranging from 25% to 35% for each of the sector.

Table 4.1. Descriptive Statistics of Research Variables

Variables	Large DBs (N=69)		Small DBs (N=346)	
	Mean	**Std. Dev**	**Mean**	**Std. Dev**
I. Loan portfolio structure: composition				
Based on Economic Sectors:				
Agriculture	0.0398	0.0409	0.0246	0.0685
Mining	0.0103	0.0152	0.0066	0.0237
Manufacturing	0.1480	0.0853	0.1361	0.0997
Electricity, Gas and Water	0.0078	0.0216	0.0019	0.0104
Constructions	0.0608	0.0489	0.0458	0.0661
Trade, hotel, and restaurants	0.2327	0.1116	0.2990	0.1851
Transportation and Communication	0.0347	0.0234	0.0394	0.0517
Business Services	0.1529	0.1156	0.1226	0.1121
Social Services	0.0100	0.0181	0.0381	0.1267
Others	0.3030	0.2409	0.2859	0.2380
Based on Loan Types:				
Working Capital	0.4479	0.2237	0.5901	0.2581
Investment	0.2779	0.1862	0.1690	0.1743
Consumption	0.2741	0.2420	0.2410	0.2332
II. Loan portfolio structure: concentration				
By Economic Sector (EHHI)	0.2944	0.1682	0.3525	0.1619
By Loan Types (THHI)	0.4957	0.1581	0.5868	0.1786
III. Loan portfolio risk				
Payment Default Risk (RISK)	0.0356	0.0359	0.0365	0.0728
IV. Return				
Gross Interest Income Ratio	0.1270	0.0501	0.1586	0.0552
V. Bank-specific characteristics				
Equity Ratio	0.0855	0.0345	11.4212	61.5573
Liquidity Ratio	0.6888	0.1777	0.7695	0.2683

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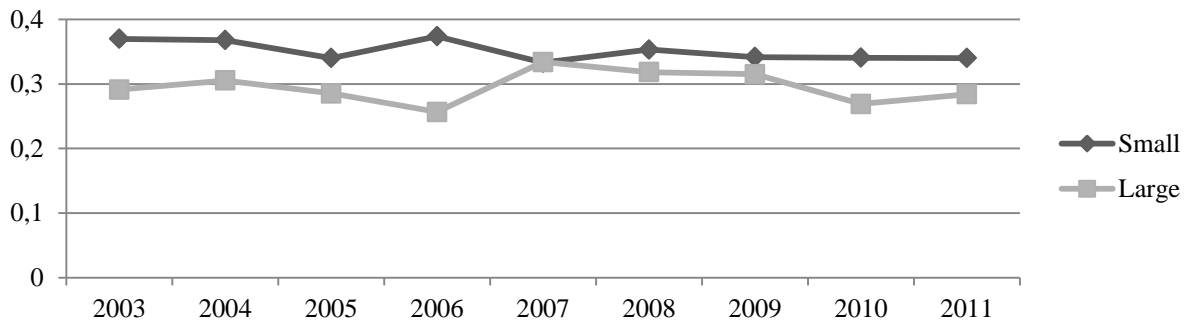

Figure 4.2. Loan Portfolio Concentration Based on Loan Types: Small and Large Domestic-owned Banks
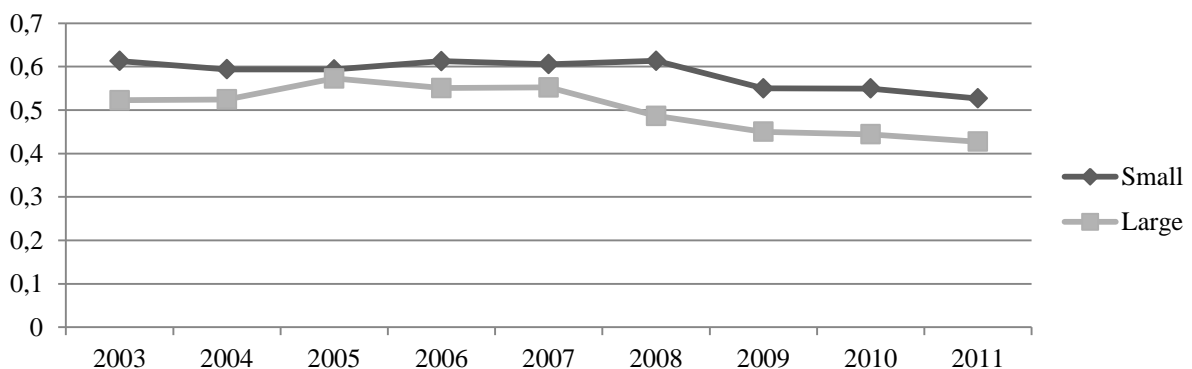
Figure 4.3. Percentage Loan Portfolio Allocation to Different Economic Sectors for Small
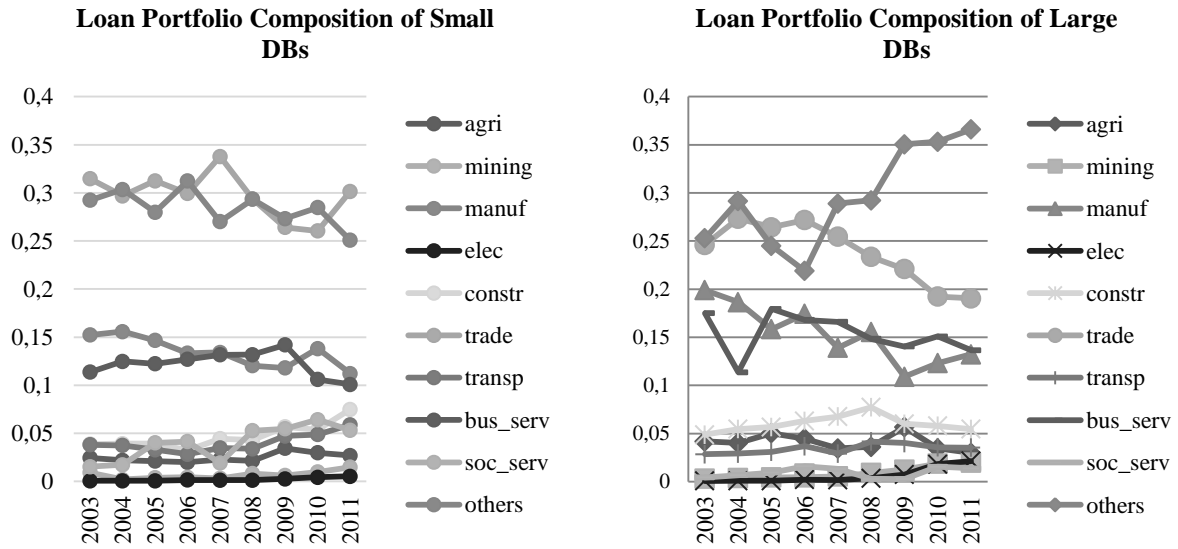vs Large Domestic-owned Banks

Figure 4.3 provide evidence that both small and large DBs focus on similar sectors but they differ in tendency. Large DBs focus primarily on the same sectors as small DBs but with a sharp declining trend for trade sectors and an increasing trend for others. The loans allocated to unspecified others represent more than 35% of the total loans of large DBs in 2011. Small DBs provide relatively smaller portions of their loans to other sectors. In this regard the highest loan allocation by the small DBs is around 30% to the trade sector in 2011.

Figure 4.4. Percentage Loan Portfolio Allocation Based on Loan Types
for Small and Large Domestic-owned Banks
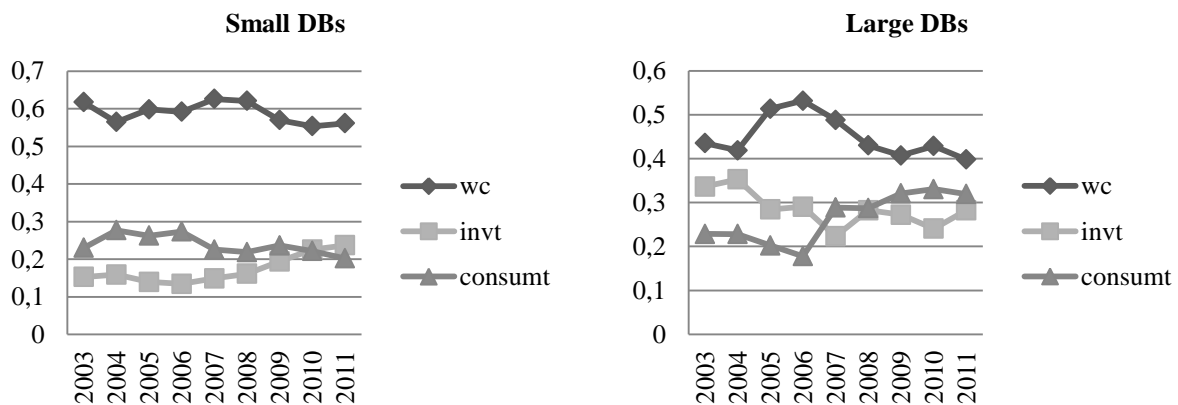
Both large and small DBs become more involved in short-term financing of different business sectors with working capital becoming their most prominent type of finance as confirmed in Figure 4.4. However, small DBs seems to be more concentrated on single types of loans compared to large DBs. It is evident from Figure 4.4 that large DBs are more diversified than small DBs with regard to loan types.

4.1.2 Loan Portfolio Performance (Risk and Return) of Large vs Small Domestic-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 4.5). The higher the NPL percentage, the higher the loan portfolio risk.

Figure 4.5. Loan Repayment Default o Risk of Small and Large Domestic-owned Banks for the period 2003 to 2011
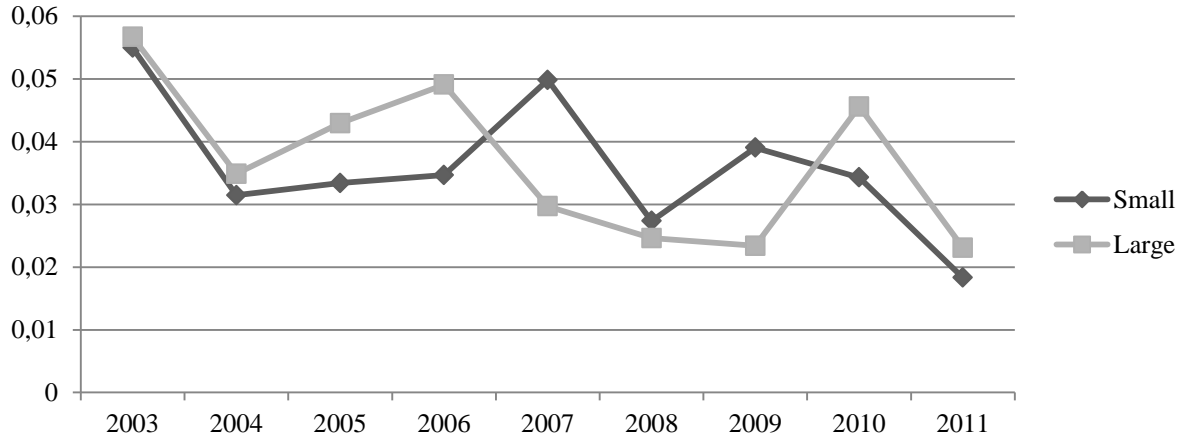
The NPLs of the small and large DBs differ the most from each other in 2007, but the differences decrease with minor NPL differences remaining in 2011. The gross NPLs of large DBs are higher than that of the small DBs in most of the years during the research period. It is interesting to note that the NPLs of small DBs exceed those of large DBs during the GFC period (2007-2009). However, small DBs experience a decrease in gross NPLs at the end of research period in 2011. Overall, the NPLs for both the small and large DBs 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 4.6. Loan Portfolio Return of Small and Large Domestic-owned Banks
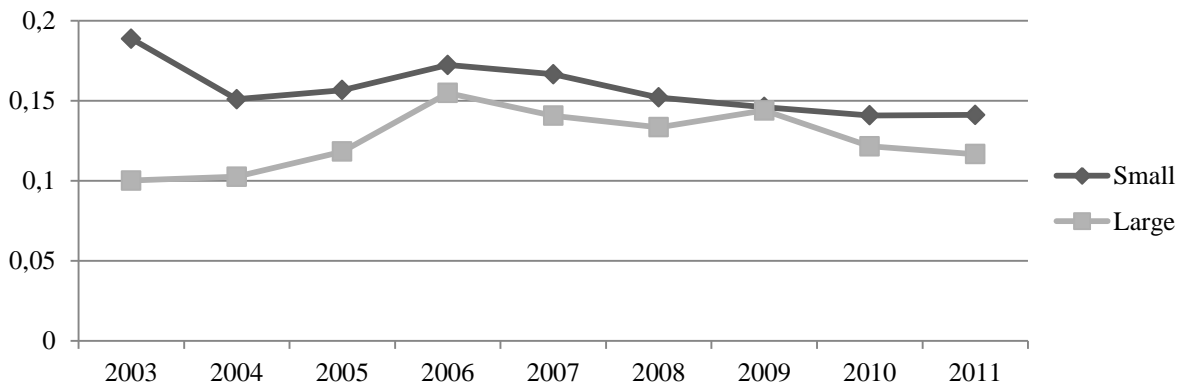
To measure the loan portfolio return, the ratio of loan interest income to average total loans is used in this research since in the broader sense it reflects the comparative pricing applied by banks.

Figure 4.6 depicts the loan interest income ratios for small and large DBs over the period 2003-2011. In general, both small and large DBs experience a downward trend in their loan interest income from 2006 to 2011. This is due to changes in the central bank interest rate (from 12.75% in 2005 to 6% in 2011)[7]. 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 DBs show the highest loan interest income in all years. Considering this situation, small DBs in general have a higher average return than large DBs over the nine year research period. In addition, 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 loan interest income to average total loans ratio.

---

[7] Central bank rate serves as the reference rate since 2005, hence no data available prior to 2005.

4.2 Differences in the loan portfolio structure and performance of small and large domestic-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 DBs.

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

	Large Banks (n=69)	Small Banks (n=346)	Difference	Mann-Whitney Test	
				Z	Prob> Z
EHHI	0.2944	0.3525	-0.0581***	4.78	0.0000
THHI	0.4957	0.5868	-0.0911***	3.373	0.0007
Risk	0.0356	0.0365	-0.0009***	-6.368	0.0000
Return	0.1270	0.1586	-0.0316***	3.959	0.0001

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

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 DBs. It therefore confirms that size does matter in explaining the loan portfolio structures and the performance of DBs in Indonesia.

4.3 Empirical results

Table 4.3 presents the fixed effect panel data regression used to determine the relationship between DB sizes; their EHHI and THHI loan portfolio concentration levels; and their loan repayment default risk (loan portfolio risk) and loan portfolio returns.

The negative coefficient of the size dummy regressors in Table 4.3 shows that the loan portfolio returns of large DBs smaller than that of small DBs, however the result is insignificant. Although the impact of size differences on loan portfolio returns is evident in the univariate analysis, the multivariate analysis gives evidence that the effect of other variables such as loan portfolio concentration (EHHI and THHI) are more significant. The negative coefficient of EHHI contradicts the findings of Hayden et.al (2006) regarding Germany banks where diversification resulted in lower return. The relationship between bank liquidity and loan portfolio returns also shows a significant negative relationship in this study. It means DBs with high liquidity ratios experience lower loan portfolio returns. 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.

To further examine the effect of size on the relationship between the independent variables and the loan portfolio returns, the interaction effect fixed effect panel data regression results are contained in Table 4.4.

Based on the information in Table 4.4, the only significant size interaction effect exists for NPL; the negative relationship between NPL and loan portfolio returns is more significant for the small DBs. This result indicates that higher risk loan portfolios provide higher loan portfolio returns for the small DBs relative to that of the large DBs.

5 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 DBs differ in terms of their loan portfolio composition, risk and performance.

The findings support the hypotheses that small and large DBs differ with regard to loan portfolio composition, risk and return. The loan portfolios of small DBs are more concentrated with focus on trade and the consumer sector whereas large DBs have more diversified loan portfolios with more exposure to the unspecified others (consumption loans). The prominent consumption sector exposure of large DBs indicates their intention to enter a higher priced and safer market segment.

The gross NPLs of large DBs is higher than that of the small DBs during most of the years in the research period but overall the NPLs of both small and large DBs show a decreasing trend from 2006 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 DBs 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 and loan loss provision (Indonesian Banking Booklet, 2003 and 2011). On the other hand, it may also be complimented by external economic factors not researched in this study.

Table 4.3. Relationship between Bank Size; Loan Portfolio Structures; and Loan Portfolio Risk with Loan Portfolio Return

		Loan Portfolio Return
CONSTANT	Coefficient	0.2138
	t-Statistic	8.03
	P-value	0.000
SIZE	Coefficient	-0.0142
	t-Statistic	-1.05
	P-value	0.295
EHHI	Coefficient	-0.0789
	t-Statistic	-2.86
	P-value	0.004***
THHI	Coefficient	0.0814
	t-Statistic	4.00
	P-value	0.000***
NPL	Coefficient	0.0005
	t-Statistic	1.60
	P-value	0.110
INT.RATE	Coefficient	0.0000
	t-Statistic	0.01
	P-value	0.989
GDP	Coefficient	-0.0000
	t-Statistic	-2.96
	P-value	0.003***
EQUITY	Coefficient	0.0000
	t-Statistic	0.87
	P-value	0.387
LQDT	Coefficient	-0.0004
	t-Statistic	8.03
	P-value	0.000***
Number of observations		415

Note: This table present the fixed effect panel data regression of equation 3.1. The dependent variable is Loan Portfolio Return (Loan Interest Income - Intinc). The independent variables are bank sizes (small and large DBs), loan portfolio concentration based on economic sector (EHHI) and based on loan types (THHI), and loan repayment default (NPL), interest rate, GDP, equity and liquidity. Definitions of variables are provided in Table 3.1. ***, **, and * respectively correspond to 1%, 5%, and 10% significance levels.

Table 4.4. Relationship between Bank Size; Loan Portfolio Structures; and Loan Portfolio Risk with Loan Portfolio Return (Interaction Effect)

		Loan Portfolio Return
CONSTANT	Coefficient	0.2280
	t-Statistic	6.24
	P-value	0.000
SIZE	Coefficient	-0.0661
	t-Statistic	-0.90
	P-value	0.369
EHHI	Coefficient	-0.0810
	t-Statistic	-1.91
	P-value	0.061*
THHI	Coefficient	0.0864
	t-Statistic	2.38
	P-value	0.021**

Table 4.4. Relationship between Bank Size; Loan Portfolio Structures; and
Loan Portfolio Risk with Loan Portfolio Return (Interaction Effect) (continued)

		Loan Portfolio Return
NPL	Coefficient	0.0006
	t-Statistic	-0.73
	P-value	0.469
INT.RATE	Coefficient	-0.0002
	t-Statistic	-0.23
	P-value	0.821
GDP	Coefficient	-0.0000
	t-Statistic	-3.03
	P-value	0.004***
EQUITY	Coefficient	0.0000
	t-Statistic	2.52
	P-value	0.015**
LQDT	Coefficient	-0.0004
	t-Statistic	-2.37
	P-value	0.021**
SIZE*EHHI	Coefficient	0.0446
	t-Statistic	0.74
	P-value	0.461
SIZE*THHI	Coefficient	-0.0232
	t-Statistic	-0.36
	P-value	0.721
SIZE*NPL	Coefficient	-0.0028
	t-Statistic	-2.33
	P-value	0.024**
SIZE*INT.RATE	Coefficient	0.0014
	t-Statistic	0.65
	P-value	0.518
SIZE*GDP	Coefficient	0.0000
	t-Statistic	1.92
	P-value	0.060**
SIZE*EQUITY	Coefficient	-0.5845
	t-Statistic	-1.29
	P-value	0.202
SIZE*LQDT	Coefficient	-0.0002
	t-Statistic	-0.27
	P-value	0.785
Number of observations		415

Note: This table present the interaction effect of fixed effect panel data regression in equation 3.1. The dependent variable is Loan Portfolio Return (Loan Interest Income - Intinc). The independent variables are bank sizes (small and large DBs), loan portfolio concentration based on economic sector (EHHI) and based on loan types (THHI), and loan repayment default (NPL), interest rate, GDP, equity and liquidity. Definitions of variables are provided in Table 3.1. ***, **, and * respectively correspond to 1%, 5%, and 10% significance levels.

Univariate analysis shows differences in the loan portfolio concentration, risk and returns of small and large DBs. However, multivariate analysis for size effect on loan portfolio returns does not provide significant results. Other variables such as loan portfolio concentration (EHHI and THHI) are the variables with significant impact on loan portfolio returns whilst bank size is insignificant. The negative coefficient of EHHI contradicts the findings of Hayden et.al (2006) regarding Germany banks where diversification resulted in lower return. The multivariate analysis for size interaction effect shows that only NPL relates significantly with bank sizes.

The negative relationship between NPL and loan portfolio returns is more significant for small DBs. This result indicates that riskier loan portfolios provide higher loan portfolio returns for small DBS relative to the large DBs. Focusing on trade segments increase the risk of small DBs loan portfolios but provides small DBs 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).

The findings reported in this paper may be of considerable interest to Indonesian Central Banks with regard to the formulation of optimal policies regarding the impact of size differences of DB on loan portfolio concentration and performance in Indonesia.

References

1. Acharya, V. V., Hasan, I. & Saunders, A. 2002. Should Banks be Diversified? Evidence From Individual Bank Loan Portfolios. Bank for International Settlements
2. Alijoyo, A., Bouma, E., Sutawinangun, T. M. N. & Kusadrianto, M. D. 2004. Corporate Governance in Indonesia. Forum for Corporate Governance Indonesia.
3. Atahau, A. D. R. & Cronje, T. 2014. Loan Portfolio Structure and Performance of Government-owned Banks in Indonesia: Does Size Matter? Corporate Ownership & Control, 11, 379-390.
4. Batunanggar, S. 2002. Indonesia's Banking Crisis Resolution: Lessons and The Way Forward. Bank of England.
5. Behr, A., Kamp, A., Memmel, C. & Pfingsten, A. 2007. Diversification and the Banks' Risk-Return Characteristics-Evidence From Loan Portfolios of German Banks. Germany: Deutsche Bundesbank.
6. Berger, A. N., Clarke, G. R. G., Cull, R., Klapper, L. & Udell, G. F. 2005a. Corporate Governance and Bank Performance: A Joint Analysis of the Static, Selection, and Dynamic Effects of Domestic, Foreign and State Ownership. World Bank Policy Research Paper, 3632.
7. Berger, A. N., Hasan, I. & Zhou, M. 2010. The Effects of Focus versus Diversification on Bank Performance: Evidence from Chinese Banks. Journal of Banking & Finance, 34, 1417-1435.
8. Berger, A. N., Miller, N. H., Petersen, M. A. & Rajan, R. G. S., Jeremy C. 2005b. Does Function follow organizational form? Evidence from the lending practices of large and small banks. Journal of Financial Economics, 76, 237-269.
9. Bonin, J. P., Hasan, I. & Wachtel, P. 2005. Bank Performance, Efficiency and Ownership in Transition Countries. Journal of Banking and Finance, 29, 31-53.
10. Carter, D. A., Mcnulty, J. E. & Verbrugge, J. A. 2004. Do Small Banks Have an Advantage in Lending? An Examination of Risk-Adjusted Yields on Business Loans at Large and Small Banks. Journal of Financial Services Research, 25, 233-252.
11. Cronje, T. 2013. Bank Lending. Australia: McGraw Hill.
12. De-Haas, R., Ferreira, D. & Taci, A. 2010. What Determines the Composition of Bank's Loan Portfolios? Evidence From Transition Countries. Journal of Banking and Finance.
13. Degryse, H., Havrylchyk, O., Jurzyk, E. & Kozak, S. 2012. Foreign Bank Entry, Credit Allocation and Lending Rates in Emerging Markets: Empirical Evidence from Poland. Journal of Banking and Finance, 36, 2949-2959.
14. Dell'ariccia, G. & Marquez, R. 2004. Information and bank credit allocation. Journal of Financial Economics, 72, 185-214.
15. Detragiache, E., Tressel, T. & Goopta, P. 2008. Foreign Bank in Poor Countries: Theory and Evidence. The Journal of Finance, LXIII, 2123-2160.
16. Deutsche Bundesbank 2006. Concentration Risk in Credit Portfolios. Germany: Deutsche Bundesbank.
17. Elsas, R., Hackethal, A. & Holzhauser, M. 2010. The Anatomy of Bank Diversification. Journal of Banking and Finance, 34, 1274-1287.
18. Elyasiani, E. & Deng, S. 2004. Diversification Effects on the Performance of Financial Services Firms Technical Report. Philadelphia.
19. Gilbert, R. A. 1984. Bank Market Structure and Competition: A Survey. Journal of Money, Credit and Banking, 16, 617-645.
20. Hayden, E., Porath, D. & Von Westernhagen, N. 2006. Does Diversification Improve the Performance of German Banks? Evidence From Individual Bank Loan Portfolios. Deustche Bundesbank
21. Hogan, W., Avram, K. J., Brown, C., Degabriele, R., Ralston, D., Skully, M., Hempel, G., Simonson, D. & Sathye, M. 2004. Management of Financial Institutions. Second Edition ed.: John Wiley & Sons Australia, Ltd.
22. Kamp, A., Pfingsten, A. & Porath, D. 2005. Do banks diversify loan portfolios? A tentative answer based on individual bank loan portfolios. Deutsche Bundesbank.
23. Laeven, L. & Levine, R. 2007. Is There a Diversification Discount in Financial Conglomerates? Journal of Financial Economics, 331-367.
24. Markowitz, H. 1952. Portfolio Selection. The Journal of Finance 7, 77-91.
25. Pangestu, M. 2003. The Indonesian Bank Crisis and Restructuring: Lessons and Implications for other Developing Countries. G-24 Discussion Paper Series. New York and Geneva: United Nations
26. Republik Indonesia 1967. "Undang-Undang Republik Indonesia Nomor 14 Tahun 1967 (14/1967) Tentang Pokok-Pokok Perbankan"[Indonesian Government Act Number 14/1967 on Banking]. Jakarta, Indonesia.
27. Republik Indonesia 1992. "Undang-Undang Republik Indonesia Nomor 7/1992 Tentang Perbankan" [Indonesian Government Act Number 7/1992 on Commercial Banks]. Jakarta, Indonesia.
28. Rossi, S. P. S., Schwaiger, M. S. & Winkler, G. 2009. How Loan Portfolio Diversification Affects Risk, Efficiency and Capitalization: A Managerial Behavior Model for Austrian Banks. Journal of Banking and Finance, 33, 2218-2226.
29. Sathye, M., Bartle, J., Vincent, M. & Boffey, R. 2003. Credit Analysis and Lending Management, Australia, John Wiley & Sons.
30. Scott, D. L. 2003. Wall Street Words: An A to Z Guide to Investment Terms for Today's Investor, Houghton Mifflin Company.
31. Tabak, B. M., Fazio, D. M. & Cajueiro, D. O. 2011. The Effects of Loan Portfolio Concentration on Brazilian Banks' Return and Risk. Journal of Banking and Finance, 35, 3065-3076.
32. Taboada, A. G. 2011. The Impact of Changes in Bank Ownership Structure on The Allocation of Capital: International Evidence. Journal of Banking and Finance, 35, 2528-2543.
33. Winton, A. 1999. Don't Put All Your Eggs in One Basket? Diversification and Specialization in Lending. University of Minnesota.