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FOREIGN BANK PENETRATION AND ITS IMPACT ON BANKING INDUSTRIES

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Abstract

The purpose of this study is to measure the impact of penetration of foreign banks in the Indonesian banking industry. The measured effects are limited to competition and efficiency during the years 2000-2011, during which was a recovery from the economic crisis in Indonesia. Panzar-Rosse measures the competition and Conjectural Variation approaches. The efficiency is measured by the Standard Profit Efficiency approach. By using panel regression method with SUR (Seemingly Unrelated Regression), we found that penetration of foreign banks will increase competition and efficiency of banking in Indonesia, especially to medium and small banks through spillover effect on domestic banking system. The increase in total assets, total loans and the amount of third party funds held by foreign banks in Indonesia will increase competition and efficiency of banks in Indonesia.

Keywords: Foreign Banks, Bank Competition, Bank Efficiency

JEL Classifications: G2, L1

1. Introduction

Since several researchers have studied the impact of the foreign bank penetration of banking competition and operational efficiency. The results of several studies in several countries reveal that penetration of foreign banks can have a positive or negative impact on competition and efficiency of banking in the host country (Yeyati and Micco, 2007; Aburime, 2009; Jeon *et al*., 2011). The effect depends on the economic conditions of the host country (See Appendix A). In the meantime, foreign banks can make the industry more concentrated, such as the competition

gets lowered (Bikker and Haaf, 2002) and the industry is losing efficiency significantly, but not in the industry that has matured (Beck *et al.*, 2006; Sturm and Williams, 2004).

The relationship between the level of penetration of foreign banks to banking competition and banking efficiency is theoretically explained in the theory of Performance Structure (Bain, 1956; Maredza and Ikhide, 2013). The penetration of foreign banks affects the level of banking concentration. While the level of banking concentration has some impact on competition:

- First, higher concentration of banks makes the banks collude or less competitive and generate high profits just as concentrated (performance structure hypothesis) or more efficient;
- Second, the high concentration of banks makes the banks become more competitive and able to sell their products at lower prices to increase market share and generate higher profits, by the efficient structural hypothesis.

Penetration of foreign banks has a positive impact on the efficiency of domestic banks. Because according to Kidwell *et al*. (2016) and Bonin *et al*. (2005), the penetration of foreign banks, especially those with lower cost structures, would allow foreign banks to sell their products at lower prices, resulting in local banks having to survive with competition through increased efficiency and lower margins from interest rates.

Empirically, the impact of penetration of foreign banks on the level of banking competition is still controversial where most of the findings indicate that the level of competition will increase along with the increase in penetration of foreign banks, and the decline in line with the increasing concentration of banks. Penetration of foreign banks or the entry of foreign banks increases banking competition through decreasing interest margin (Claessens *et al.* 2001; Gelos and Roldos, 2004; Crystal *et al.* 2002; Peria and Mody, 2004; Barth *et al.* 2004; La Porta *et al.* 2002; Berger *et al.* 2004). In contrast, restricting the entry of foreign banks will increase the intermediate spreads since domestic banks face lower pressure competition when the entry of foreign banks are prevented, thereby reducing the competition. Poshakwale and Qian (2011) found a positive relationship in the short term.

Jeon *et al.* (2011) also found a positive relationship between the foreign bank's penetration with the competition. This is related to the spillover effect of foreign banks to domestic banks, which belong to its counterparts. The spillover effect is more significant when more efficient and low-risk foreign banks enter a country which has less concentrated banking market structure.

However, the opposite results were found by Levy-Yeyati *et al*. (2004) which analyzed the consequences of the consolidation process and internationalization toward competition and banking sector weaknesses of eight Latin American countries and found that the increase of concentration is not significant in every sector. They discovered that foreign bank penetration weakens banking competition, negatively related to bank risk.

Demirguc-Kunt *et al.* (2003) also conducted related studies in 77 countries which analyze the effect of banking competition and policies towards efficiency. The results of the survey were that the banking competition has a positive and significant impact on the efficiency of the banking system.

Moreover, Claessens *et al.* (2001) analyzed the role of foreign banks in a cross-country study, and it showed that the entry of foreign banks would make the domestic banking system more efficient by reducing the interest margin. DeYoung and Nolle (1996), Berger *et al.* (2000), Claessens *et al.* (2001), and Levine (2003) found that foreign bank penetration was increasing banking competition and the efficiency of foreign banks and domestic banks.

In the case of Indonesia, foreign bank penetration is expected to affect the level of banking competition. Based on the data, it was known that the foreign bank asset growth during 2004 – 2008 increased, while Kusumastuti (2008) found that the level of banking competition during the 1998-2006 decreased. It means that the increase of foreign bank's assets is expected to lower the level of banking competition in Indonesia and it needs to be empirically proven. Therefore, the purpose of this study is to determine the impact of the foreign bank penetration toward banking competition and efficiency in Indonesia in 2000-2011. The structure of the study is divided into two parts: (i) foreign bank penetration conditions, the level of bank

concentration, competition, and efficiency in Indonesia; (ii) the empirical results and the implications.

2. Literature Review

Foreign bank penetration or foreign bank presence in a country has several forms. Those are Correspondent Banks, Representative Offices, Agencies, Subsidiaries, and Branch Banks. The correspondent bank aims to facilitate international payment mechanism between the institutions, which enable them to make remote payments via debit and credit of each account then settle the payment on the back end. The representative office is an intermediary between the parent bank and the correspondent bank, where the representative is not allowed to conduct ordinary banking activities, although they can accept checks and collect the loan to the central office and make relationships with the customers. The agent is the office of a foreign bank that does not allow deposits from citizens or people living in the US (host country) and can only keep the credit balance related to their international activities. The subsidiary bank is making a new institution or through the existing domestic bank's acquisition and generally can be involved in all kinds of the bank's activities (Deak and Celusak, 1984).

There are two strategies for how foreign banks enter the host country: traditional and innovative. Traditionally, international banks come to other countries by establishing branches or subsidiaries that are wholly owned by the head office. These banks process trade financing, foreign exchange transactions, and loans to companies. Moreover, innovator enters the host country in three ways: Moreover, innovator enters the host country in three ways: bettors[1], prospectors[2], and restructures[3] (Tschoegl, 2004).

Many studies on foreign banks appear to make the definition of foreign banks diminutive and to its measurement as well. Some researchers had taken its analysis for granted. They assume that foreign banks measurements can be represented only by one or two indicators such as its number, the number of branches, total assets, productive assets, or else. Given the enormous amounts of ratios within the financial reports that do exist and possible, the measurements for the existence of foreign banks can be tens of indicators. It only requires how we elaborately define earnings, revenues, incomes, profits, sales, etc.

The definition of foreign banks in Indonesia remains vague and unclear. Its latest description was provided in the Banking Act No.10/1998, as an amendment to the Act No.7/1992. The second amendment has been registered as the priority in the national legislative process of the parliament by 2014. Recently, some discourse to redefine the foreign banks in Indonesia has resurfaced. Previously,

Based on the theory of Structure, Conduct Performance (Bain, 1956; Maredza and Ikhide, 2013), the penetration of foreign banks has impacts on various economic variables such as the level of concentration and banking competition, the level of bank efficiency and the stability of the financial system of a country. The impact depends on how the domestic banking conducts/responds to the foreign bank penetration, and theoretically, it can be positive or negative. When local banks react to the structural performance hypothesis, then, the foreign bank penetration is responding in higher banking concentration levels, thereby weakening the competition, which can reduce the efficiency or otherwise lead to cooperation and increase productivity. Conversely, if the domestic banks respond to the efficient structure hypothesis, foreign bank penetration will increase banking competition and efficiency.

Next, the following explanations will describe the findings of previous studies related to the impact of the foreign bank penetration on banking competition level and how the foreign bank penetration influence the efficiency of domestic banking.

2.1. Foreign Bank Penetration and Banking Competition

Claessens and Laeven (2004) examined the banking competition in 50 banking system in the world by using P-R structural model and related the competition level to the structures of the countries and policy indicators. The results of the study showed that the system by allowing foreign banks enter the market and limit the activity would increase the competition value. Then,

restricting commercial bank entry will reduce the level of competition. In this study, it was also found that the level of concentration does not inversely relate to the competition, otherwise, when the bank is more concentrated, it will be more competitive.

A similar study was conducted by Cerutti *et al*. (2007) studying the shape of foreign bank organizations in a country using the data of the 100 largest banks operating in Eastern Europe and Latin America. From these studies, it is known that banks will operate as branches in host countries with higher taxes and fewer regulatory restrictions for entry of banks and branches of foreign banks. The Bank will operate as a branch in the host country with relatively low economic risk characteristics. In a host country that has a high-risk macroeconomic environment, it limits its obligations through a subsidiary with provision protection, while subsidiary bank operations are selected by banks seeking penetration of host country markets by building large retail operations. If risks come from government intervention and other major political events (e.g., unrest or war), then the parent bank prefers to operate as a branch.

Before the liberalization of the financial system, many countries use several laws to restrict the foreign banks' entry. The law reflects the debt of the government to open up the domestic financial competition for foreign competition. In the 1990s, the restrictions on the foreign bank entry have been much reduced. Government's view of the influence of foreign banks to the domestic banks has changed. It is caused by several things described by Lensink and Hermes (2004):

- The entry of foreign banks stimulates the local banks to reduce costs, improve the efficiency and enhance diversity in financial services through competition;
- The entry of foreign banks brings positive side effects. Foreign banks are introducing new financial system services. The introduction of this new service system, stimulating domestic banks to develop new services, improves the financial intermediation efficiency of the local financial system;
- Foreign banks improve the quality of human resources in the domestic banking system in many ways.

The relationship between foreign bank penetration, competition, and economic growth has been studied by Barth *et al*. (2001), La Porta *et al.* (2002), Berger *et al.* (2004). Foreign bank penetration or entry of foreign banks in these studies is proven increased banking competition. They found that the restrictions of foreign bank entry rise the intermediate spreads since the domestic banks face lower pressure competition when the foreign banks' entry is restricted. As competition increases, banks will trigger to be more efficient, so creating a rate of return and the opportunity that supports to attract more savings, and ultimately improve the availability of funds for capital investment and boost economic growth (Utami and Nugroho, 2017; Nugroho *et al.* 2017b).
Some studies have used a new paradigm of Breshanan method or P-R method to analyze the competition in the banking system of developed countries (Claessens and Laeven, 2004). Belaisch (2003) used P-R approach and reported evidence of non-monopolistic market structure in Brazil (Gelos and Roldos, 2004) used P-R approach to analyze some banking markets in some developing countries. They concluded that lower barriers to entry, such as allowing the entry of foreign banks, would prevent the lowering competitive pressures.

A study conducted by Engerer and Schrooten (2004) explored that the foreign bank's entry in a country has three advantages:

- Increasing financial intermediation in the domestic market through the meaning acquisition of a financial institution with a strong reputation from abroad and boost the confidence in the banking sector;
- Importing appropriate risk management, thereby reducing transaction costs in the financial area;
- Helping introduce a proper regulatory regime for the entire banking sector.

Peria and Mody (2004) examined the influence of foreign bank participation in the banks spread by using Latin American countries as the sample in the late 1990s. Based on their study, it was found that foreign banks bear lower interest margins and potentially assist the development of financial intermediation. Foreign banks' entry affects intimidation by reducing the operational costs. In the long term, the benefit of foreign banks' entry will reduce the cost structure of the banking system.

The impact of penetration of foreign banks on competition is also expressed by Jeon *et al.* (2011) with the focus of analysis in Asia and Latin America during 1997-2008. The study uses bank panel data to measure banking competition. They found a positive relationship between the penetration of foreign banks and competition. This is related to the impact of spillover from foreign banks to domestic banks that become partners. The effect of this spillover will be more significant if there are more efficient and low-risk foreign banks entering a country with a less concentrated banking market structure. The study also found that the impact of spillover is even more significant if foreign banks are in the form of de-novo penetration rather than through mergers or acquisitions from domestic banks.

Based on those findings above, it can be seen the relationship between foreign bank penetration, concentration level, and banking competition. Domestic banks will try to maintain its market share by improving the service quality, so it will adopt a more modern service system to recover the efficiency costs of financial intermediation. If the domestic bank fails to maintain its market share, there will be changes in the banking market structure which is seen from the changes in banking concentration level. The changes, therefore, will affect the level of banking competition.

2.2. Banking Competition and Efficiency

Bain (1956) and Okeahalam (2002) argue that SCP approach (Structure Conduct Performance) can be used to see the relationship between market structure and the performance. In this theory, it is explained that the differences in market structure will affect bank performance in both structure performance hypothesis and efficient structure hypothesis. Similar studies have developed, and some of them support the theory of SCP while the others rejected. Berger and Hannan (1989) found the relationship between concentration level and competition, similar to the SCP theory which supports the hypothesis that a higher profit is caused by the banking concentration. Similar studies were done by Smirlock *et al.* (1984), Rhoades (1982), Smirlock (1985), Shepherd (1986). The results, however, were different from SCP theory which claims that a higher profit of a bank is not affected by the higher level of banking concentration, but by the efficiency of the banking itself.

The empirical findings regarding the relationship between market structure, behavior and performance evolved into a new paradigm called the New Empirical Industrial Organization which no longer relies on the relationship between structure, conduct and performance alone, but has incorporated several other factors that influence bank performance. Some of these factors include revenue behavior, risk profile, entry/exit barriers and general market behavior. Models using this new paradigm were developed by Panzar and Rosse (1987) and Bresnahan (1989). They tested the competition using market power in explaining the competition behavior of banks. Panzar and Rose (P-R) assume that banks operate in long-term equilibrium and actions or actions of market participants influence the performance of these banks. The P-R proves that in the monopoly market, rising input prices will raise marginal costs, lower the output of equilibrium and then decrease revenue. Lower interbank competition will decrease the income which leads to reduced efficiency.

Then, using bank-level data for 77 countries, Demirguc-Kunt et al. (2003) explore the impact of bank concentration and policy on efficiency. They found that bank concentration had a significant adverse effect on the efficiency of the banking system, except for developed countries with sound financial systems. Nevertheless, the banking industry's condition is increasingly concentrated, and its impact becomes less competitive and leads to lower efficiency.

2.3. Foreign Bank Penetration and Banking Efficiency

According to Kidwell *et al*. (2016), the relationship between penetration of foreign banks and the efficiency of domestic banks concerning government regulations designed to facilitate the entry of foreign banks will affect banking competition and efficiency. Under efficient structural hypotheses, the entry of foreign banks, especially for those with low-cost structures will sell their production at lower prices, lower interest margins in domestic banks and improve efficiency..

Claessens *et al.* (2001) analyzed the role of foreign banks in a cross-country study and showed that foreign banks' entry would make the domestic banking system to be more efficient by reducing its margin. In the long term, foreign banks' entry will improve national bank functions with a positive welfare of their customers.

The relationship between penetration, efficiency and profitability have been investigated by some researchers such as DeYoung and Nolle (1996), Berger *et al.* (2000), and Claessens *et al.* (2001), Levine (2003). These studies revealed that the foreign bank penetration affects the banking competition and the efficiency for both foreign and domestic banks. Foreign banks face a lot of difficulties in implementing attracting strategy of local companies through its branch in the country. DeYoung and Nolle (1996) and Berger *et al.* (2000) found that how a foreign affiliate bank becomes less efficient than domestic banks due to the economic borders (limiting of financial, language, cultural and other. Gobbi and Lotti (2004) also showed the similar causes. Furthermore, Barth *et al.* (2004) found adverse effects of state ownership on the entire banking sector development and efficiency.

The analysis of the impact of market structure on bank profitability, Chen and Liao (2011) analyzed the long-term relationship between bank profitability and market structure measured by structural approach (H-statistic Panzar-Rosse and Lerner index) and static approach (IHH and CR) in 70 countries during 1992-2006. They found that foreign banks are more profitable compared to domestic banks when they operate in the host country, when the banking sector is less competitive and the home bank parent is in high profits. Furthermore, when foreign banks operate in the host country with low GDP growth, high-interest rates and high inflation, with strict regulation, the margins of foreign banks will increase. Specifically, a change in supervision over the tightness of parent bank ownership in the home country significantly increases the margin of foreign banks, while changes in control over compliance with Basel risk in the host country will increase the margins of foreign banks..

2.4. Regulation and Banking Competition and Efficiency

Apart from the foreign bank penetration variable, the banking regulatory factors also have an impact on competition and efficiency. Banking regulation can weaken the competition such as restrictions of foreign banks entry to the banking market structure (Vives, 1991; Fischer and Pfeil. 2003). Angelini and Cetorelli (2003) found the positive impact of the Second European Banking Directive favorably to the competition. Moreover, Gual (1999) revealed a positive effect of banking deregulation in Europe during 1981-1995 towards banking concentration. Spiller and Favaro (1984) also presented the impact of tightening regulation of foreign banks' entry in Uruguay in 1978 which decreases the competition. Therefore, it can be said that loosening the foreign banks' entry will increase the competition; otherwise, tightening the foreign banks' entry will reduce the competition.

Levine (2003) distinguished the impact of restrictions on foreign banks and domestic banks' entry. When the limitation made to the foreign banks, it will affect the interest rate margin, whereas it is the contrary in local banks. On the other hand, the contribution of foreign ownership of domestic banks to the banking efficiency in developed countries, the fraction of the local banking industry owned by foreign banks will not affect the interest rate margin. Demirguc-Kunt *et al.* (2003) analyzed the impact of banking regulations on the net interest margin and found that tightening banking regulations will boost the net interest margin.

According to Usman (2010) and Shaffer and Spierdijk (2015), the concentration of the banking industry in Indonesia tends to lower from 1999 through 2009, and the competition became monopolized (Usman, 2011). Usman (2012) also found that foreign banks did increase the competition, leaving the NIM unaltered. He also urged the Indonesian monetary authority to set the rules for foreign banks to comply with Indonesian laws fully. The first thing to do is to legalize the foreign bank as a legal subject by establishing its entity as a corporation (PT, *Perseroan Terbatas*) under Indonesian statute. As foreign banks establishments fail to lower its efficiency, measured by its NIM, the industry remains highly concentrated and leaving banks with small to medium scale vulnerable as the targets of foreign acquisitions.

2.5. Foreign Bank Penetration in Indonesia

In Indonesia, bank ownership is classified into five categories, i.e., state-owned, banks owned by province governments (BPD, *Bank Pembangunan Daerah*), national private, foreign, and joint venture. National private banks are comprised of banks allowed to trade foreign exchange (BUSN Devisa, *Bank Umum Swasta Nasional*) and the ones that not allowed (BUSN Non-Devisa). As of August 2014, there are four state-owned banks, 67 national private banks (comprising of 38 BUSN Devisa and 29 BUSN Non-Devisa), 26 BPD, 12 joint venture banks, and ten foreign banks. With Rp 410.5 trillion as its assets, the foreign banks command the industry by 7.87% (Table 1). The figure does not include the joint venture banks that have a share in the market up to 4.83%. Both groups control the banking market in Indonesia by 12.70%, exclusive of the size of Islamic banking market in Indonesia.

Although the share has been relatively low, in figures, yet, the impacts of foreign exposures remain elusive. The pressures come to reality at the exchange rate of Indonesian rupiah moves unpredictable and are hard to be calculated and synchronized with the existing foreign reserves available at present and at the shortest time. Increased foreign ownership in domestic banks is a phenomenon that has grown since the Micro Banking policy enacted in February 1992, which allows foreign investors to buy shares of local banks. Ownership limit in the Indonesia's banking system is the most liberal in the world that is up to 99 percent. Foreign investment has reached about 54 percent of total domestic banking assets, and it is alarming. It means that banks in Indonesia, which has high profitability and a source of national economic strength have primarily been controlled by foreign parties.

Foreign ownership in a bank in Indonesia can take 3 (three) types, which are as a branch office (which is called as an international bank), as a subsidiary through a joint venture or merger with, or acquisition of local banks, or as a representative office. Foreign ownership in a bank is not limited to individuals, corporations, government agencies, but have expanded to various consortiums comprised of institutions such as SWFs (Sovereign Wealth Fund), family (investment) offices, or else.

According to Usman (2012) and Nugroho *et al.* (2017a), the regulations to foreign banks indeed increase the competition in pursuing the fee-based income over credit channeling or loan syndications, but not in credit disbursement mainly to small and medium companies. In general, the single presence policy just lowered the efficiency of Indonesian banking industry.

Most previous studies measured foreign banks by the number, office branches, assets, deposits, loans disbursed, and so on about its impact on the competition and concentration in the (Indonesian) banking industry (Nugroho *et al.* 2017a). None has used foreign ownership in any bank operating in Indonesia. This study will implement foreign ownership in the local bank as the measurement of foreign (bank) penetration in the Indonesian banking industry.

3. Framework, Data, and Methodology

3.1. Framework of Research

Based on Figure 1 below, we can derive two models to estimate the impacts of foreign bank penetration and industrial concentration on the degree of banking competition. The second model to predict is the impacts of those three variables on banking efficiency.

Based on the literature review and previous empirical findings, we hypothesized that foreign bank penetration would lower Indonesia's banking competition and efficiency. Foreign bank's existence makes the domestic banking industry more concentrated, and the competition gets reduced. As it becomes more focused, the industry is losing the efficiency.

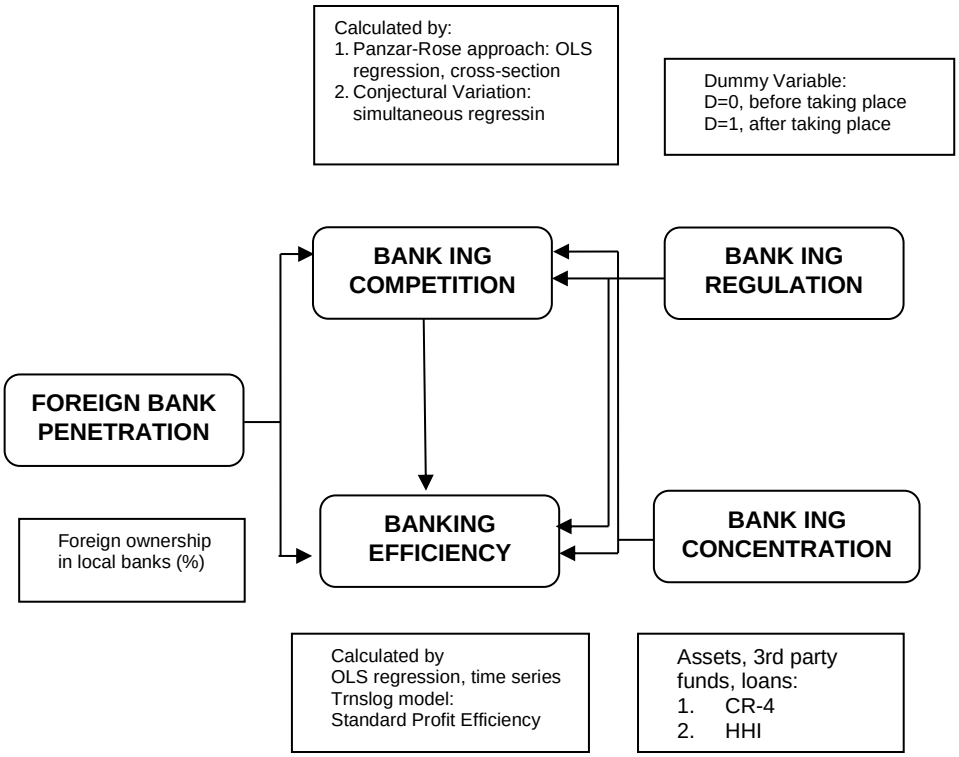

Figure 1. Framework of Research

Two primary models that are competitive equation and efficiency equation were regressed with SUR (seemingly unrelated regression).

The competition equations to be regressed are as follows:

$$Comp_{it} = f(FBP_{it}, BC_{it}, BR_{it}, e_{it}) \quad (1)$$

The efficiency equations to be regressed are as follows:

$$EFF_{it} = f(FBP_{it}, Comp_{it}, BC_{it}, BR_{it}, v_{it}) \quad (2)$$

Whereas i represent a bank, t represents a period; FBP is Foreign Bank Penetration; Comp is the Competition level, measured by Panzar-Rosse approach and Conjectural Variation approach; BC is Bank Concentration Ratio which, measured by Concentration Ratio for the top 4 (four) bank and the Herfindahl Index in terms of Assets; Credit and Deposit. EFF is Bank efficiency, measured by SPEEF (Standard Standard Profit Efficiency and BR is Bank Regulation, weighed by the Single Presence Policy (The measurement is presented in Appendix B).

Estimation of the data panel model can be carried out through 3 approaches, that is pooled-least square (PLS), fixed effect model (FEM), and random effect model (REM). To select the best method between PLS and FEM, we implement the Chow test. To choose the best approach between FEM and REM, we apply the Hausman test (Baltagi, 2008).

This research will make a quantitative analysis based on the financial reports of 114 banks operating in Indonesia during 2000-2011. As the period of observation configure the study to be time-series, and the number of banks sets the analysis to be cross-section, such combination makes data panel analysis to be the research method implemented.

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4. Analysis and Discussion

4.1. Foreign Bank Penetration (FBP)

The average foreign ownerships in large-scale local banks tend to grow, from 31% in 2000 to 54% in 2011; while medium-scale local banks increased from 24.5% in 2000 to 31% in 2011; and small-scale local banks grew from 8% in 2000 to 22.6% in 2011.

In total, foreign ownership in all banks grew from 21% in 2000 to 36% in 2011. These figures were not associated with the real and absolute values of assets, equity, capital, etc. of the banks, but purely the relative value within each bank.

Table 1. Foreign Ownership of Domestic Bank of Indonesia

Year	Entire Bank	Large- scale Bank	Medium-scale Bank	Small-scale Bank
2000	0.2115	0.3080	0.2447	0.0818
2001	0.2174	0.3152	0.2533	0.0836
2002	0.2174	0.3152	0.2533	0.0836
2003	0.2569	0.3821	0.3062	0.0822
2004	0.2672	0.4180	0.3015	0.0822
2005	0.2775	0.4752	0.2999	0.0575
2006	0.2987	0.4960	0.3011	0.0990
2007	0.3073	0.4965	0.3090	0.1165
2008	0.3450	0.5490	0.2970	0.1890
2009	0.3535	0.5528	0.2930	0.2147
2010	0.3652	0.5625	0.2997	0.2334
2011	0.3603	0.5411	0.3132	0.2266

4.2. Bank Concentration (BC)

A bank is classified as the largest bank as its assets are more than Rp 10 trillion; as the medium-scale bank as its asset value is between Rp 1 to Rp 10 trillion; and as the small-scale bank as its assets is less than Rp 1 trillion.

Three financial indicators used to measure the concentration ratios are assets, credits, and deposits. Table 2 shows the measurement of concentration ratios of the four and five largest banks and the HHI. The banking industry became less concentrated from 2000 to 2011. In CR-4, the concentration ratio got lowered from 55.6% to 45.5%; and in HHI, from 11.3% to 6.9%.

Table 2. The concentration of banking in Indonesia in 2000-2011

Year	CR3 Asset	CR5 Asset	HHI Asset	CR3 Credit	CR5 Credit	HHI Credit	CR3 DPK	CR5 DPK	HHI DPK
2000	0.488	0.624	0.113	0.387	0.508	0.068	0.501	0.623	0.108
2001	0.497	0.626	0.111	0.385	0.474	0.065	0.504	0.633	0.110
2002	0.485	0.616	0.104	0.405	0.518	0.073	0.491	0.625	0.104
2003	0.469	0.605	0.096	0.400	0.518	0.071	0.474	0.612	0.095
2004	0.443	0.582	0.086	0.420	0.560	0.080	0.464	0.596	0.090
2005	0.400	0.538	0.075	0.363	0.501	0.065	0.417	0.549	0.079
2006	0.377	0.524	0.068	0.356	0.494	0.063	0.398	0.545	0.073
2007	0.388	0.531	0.070	0.347	0.489	0.061	0.411	0.553	0.076
2008	0.375	0.513	0.067	0.344	0.489	0.060	0.402	0.547	0.074
2009	0.395	0.531	0.070	0.365	0.509	0.065	0.421	0.566	0.078
2010	0.384	0.525	0.069	0.353	0.495	0.062	0.408	0.553	0.075
2011	0.385	0.525	0.069	0.352	0.496	0.062	0.411	0.555	0.076

4.3. Bank Competition (Comp)

Implementing the Panzar-Rose approach, market competition in the Indonesian banking industry is measured to be monopolistic, mostly. In 2006, the competition was measured as correctly as the value of the H - stat was 0.963. The second highest H-stat value, 0.914, which happened in 2007 set the competition as monopolistic. This is answering the Eq. (3) From Appendix B question.

Table 3. H-statistic Value of Panzar-Rosse and Competition Forms of Entire Bank Per Year

		Wald test			Market Structure
	H-Stat	Hypothesis	Prob		
1999	0.261	H-Stat = 0	0.006	***	Monopolistic Competition
		H-Stat = 1	0.000	***	
2000	0.866	H-Stat = 0	0.000	***	Monopolistic Competition
		H-Stat = 1	0.026	**	
2001	0.373	H-Stat = 0	0.000	***	Monopolistic Competition
		H-Stat = 1	0.000	***	
2002	0.421	H-Stat = 0	0.000	***	Monopolistic Competition
		H-Stat = 1	0.000	***	
2003	0.697	H-Stat = 0	0.000	***	Monopolistic Competition
		H-Stat = 1	0.000	***	
2004	0.650	H-Stat = 0	0.000	***	Monopolistic Competition
		H-Stat = 1	0.000	***	
2005	0.535	H-Stat = 0	0.000	***	Monopolistic Competition
		H-Stat = 1	0.000	***	
2006	0.963	H-Stat = 0	0.000	***	Perfect Competition
		H-Stat = 1	0.328	***	
2007	0.914	H-Stat = 0	0.000	***	Monopolistic Competition
		H-Stat = 1	0.038	**	
2008	0.482	H-Stat = 0	0.000	***	Monopolistic Competition
		H-Stat = 1	0.000	***	
2009	0.450	H-Stat = 0	0.000	***	Monopolistic Competition
		H-Stat = 1	0.000	***	
2010	0.534	H-Stat = 0	0.000	***	Monopolistic Competition
		H-Stat = 1	0.000	***	
2011	0.620	H-Stat = 0	0.000	***	Monopolistic Competition
		H-Stat = 1	0.000	***	

Note: *significant at 10%, ** significant at 5%, and *** significant at 1%.

Conjectural-Variation approach, the market competition was measured by estimating the equation with simultaneous regression with SUR (Seemingly Unrelated Regression) method. The estimated figures of Eq. (4) And Eq. (5) in Appendix B is known as the Lerner Index, the Conjectural-Variation competition coefficients. The regression results show that the market structure of the Indonesian banking industry has been monopolistic.

Table 4. The Degree of Conjectural Variation Competition (Indeks Lerner)

Year	Index Lerner of Entire Bank	Index Lerner of Large Bank	Index Lerner of Medium Bank	Index Lerner of Small Bank
2000	0.695	0.803	0.067	0.034
2001	0.562	0.653	0.068	0.044
2002	0.531	0.630	0.100	0.061
2003	0.589	0.662	0.175	0.144
2004	0.663	0.700	0.263	0.287
2005	0.602	0.622	0.199	0.243
2006	0.549	0.612	0.170	0.190
2007	0.555	0.645	0.181	0.252
2008	0.556	0.652	0.186	0.260
2009	0.585	0.657	0.233	0.179
2010	0.679	0.727	0.241	0.268
2011	0.703	0.794	0.292	0.280

Sources: data analysis

4.4. Bank Efficiency (EFF)

The estimated figures of Eq. (6) And Eq. (7) From Appendix B is to measure bank efficiency coefficients, SPEFF. The regression results show that foreign banks and BPDs were the most efficient groups of banks within the Indonesian banking industry, in general. Several national private banks, state-owned banks, and joint venture banks can be included as the most efficient banks as well.

Table 5. The Most Efficient Banks Based on the Calculation of Standard Profit Efficiency in 1999-2011

Rank	1999	2003	2007	2011
1	The Hongkong & Shanghai B.C	The Hongkong & Shanghai B.C	Standard Chartered Bank	Standard Chartered Bank
2	Standard Chartered Bank	Standard Chartered Bank	The Hongkong & Shanghai B.C	The Hongkong & Shanghai B.C
3	PT Bank Bisnis Internasional	The Bank of Tokyo Mitsubishi UFJLTD	PT Bank BPD PAPUA	PT Bank BPD PAPUA
4	PT Bank BPD Sulawesi Tengah	JP Morgan Chase Bank N.A	CITIBANK N.A	PT. Bank Central Asia
5	PT Bank Fama Internasional	PT Bank Maybank Indocorp	PT Bank BPD Bengkulu	PT Bank BPD Aceh
6	PT Bank BPD Kalimantan Selatan	CITIBANK N.A	PT Bank BPD Kalimantan Tengah	PT Bank BPD Sulawesi Tenggara
7	PT Bank Multi Arta Sentosa	ABN AMRO Bank	PT Bank BPD Sulawesi Tenggara	PT Bank BPD Yogyakarta
8	PT Bank BPD JAMBI	PT BANK BNP Paribas Indonesia	PT Bank Rakyat Indonesia, Tbk	PT Bank Rakyat Indonesia, Tbk
9	PT Bank Mestika Dharma	The Bangkok Bank Comp LTD	PT Bank KEB Indonesia	PT. Bank BPD Jawa Timur
10	PT Bank Kesejahteraan Ekonomi	Deutsche Bank AG	PT Bank BPD Yogyakarta	PT. Bank BPD Bali
11	PT Bank BPD Yogyakarta	PT Bank BPD RIAU	PT Bank BPD Jawa Timur	PT Bank BPD RIAU

The results of panel data regression (Eq. 1) with SUR was shown in Table 6. Based on the adjusted R-squared values, the best models that fulfilled the Goodness of Fit and F-stat criteria are FEM for Panzar Rosse (model 2) and FEM for Conjectural model 4, 5 and 6.

In model 2, the foreign bank penetration has adverse effects on the competition. So were the concentration ratios regarding bank credits and bank deposits. The single Presence policy has a positive impact on the competition.

Table 6. The impacts of foreign bank penetration to the industry concerning concentration and competition

	Independent Variables	Dependent Variables is Competition					
		Panzar Rosse			Conjectural		
	Best Model	PLS Model 1	FEM Model 2	PLS Model 3	FEM Model 4	FEM Model 5	FEM Model 6
Foreign Bank Penetration	FBP	0.02	-0.06***	-0.04***	0.04***	-0.01	0.99
		(0.1203)	(0.0045)	(0.0044)	(0.0012)	(0.4163)	(0.1737)
Bank Concentration	CR_ASET	8.37***			6.48***		
		(0.0008)			(0.0006)		
	IHH_ASET	6.82***			2.62		
		(0.0457)			(0.3138)		
	CR_CREDIT		-2.64			-0.51	
			(0.3132)			(0.3508)	
	IHH_CREDIT		-19.6**			6.12**	
			(0.0107)			(0.0239)	
	CR_DPK			-1.77			1.25
				(0.4732)			(0.4090)
	IHH_DPK			-5.7			10.66***
				(0.1700)			(0.0007)
Bank Regulation	BR	0.01	0.02**	0.02	-0.04	-0.13**	-0.11*
		(0.2679)	(0.0266)	(0.3307)	(0.1900)	(0.04805)	(0.0532)
	Adj R2	0.01	0.73	-0.01	0.79	0.8	0.71
	F-Stat Prob	(0.6900)	(0.0000)	(0.6900)	(0.0000)	(0.0000)	(0.0000)

Notes: The table present regression estimation results. Coefficients are followed by p-value in parenthesis. Dependent variable is bank competition (measured by using Panzar Rosse and Conjectural Variation method) . FBP is the abbreviated form for Foreign Bank Penetration foreign ownership in local bank (%). Other independent variables are Bank Concentration and Bank Regulation. Bank Concentration is measured by Concentration Ratio (CR) and Herfidahl Hirchman Index (HHI) of Banking Industry by using Asset, Credit and Third Party Fund (DPK). BR is is the abbreviated form for Bank Regulation which measured by Dummy Variable for Single Presence Policy (BR=0, before the policy is taken and BR=1, after policy is taken). PLS is abbreviated form for Pooling Least Square, FEM for Fixed Effect Method and REM for Random Effect Method. (*) , (**) and (**) indicate significance at 10%, 5% and 1% levels, respectively.

Table 7 shows result from Eq.2 that foreign bank penetration has lowered the efficiency in the banking industry, as indicated by the concentration ratios concerning assets and bank credits. As the industry became concentrated, the banking industry got less efficient. The Single Presence Policy has a positive effect on efficiency.

Table. 7 The impacts of foreign bank penetration, market concentration, and market competition to the efficiency in the banking industry

	Independent Variables	Dependent Variables are Efficiency		
		Model 7	Model 8	Model 9
	Best model	PLS	PLS	PLS
Foreign Bank penetration	FBP	-0.045***	-0.056***	0.008
		(0.0000)	(0.0000)	(0.2701)
Bank Concentration	CR_ASET	-3.541***		
		(0.0000)		
	IHH_ASET	-1.303**		
		(0.0496)		
	CR_CREDIT		-0.771	
			(0.1100)	
	IHH_CREDIT		-6.961***	
			(0.0000)	
	CR_DPK			-3.207**
				(0.0134)
	IHH_DPK			-3.01***
				(0.0000)
Bank Competition	PR	-0.002	0.0167	0.002
		(0.9296)	(0.6144)	(0.9131)
	CV	-0.328***	-0.451***	-0.128
		(0.0034)	(0.0002)	(0.3266)
Bank Regulation	BR	0.113	0.329**	0.52*
		(0.1916)	(0.0203)	(0.0543)
	Adj R-Squared	0.139	0.379	0.385
	F-Stat Prob	(0.0280)	(0.0200)	(0.0160)

Notes: The table present regression estimation results. Coefficients are followed by p-value in parenthesis. Dependent variable is bank efficient (Standard Profit Efficiency method) . Independent variables are Foreign Bank Penetration, Bank Concentration, Bank Competition (measured by using Panzar Rosse (PR) and Conjectural Variation (CV) method) and Bank Regulation. Bank Concentration is measured by Concentration Ratio (CR) and Herfidahl Hirchman Index (HHI) of Banking Industry by using Asset, Credit and Third Party Fund (DPK). BR is is the abbreviated form for Bank Regulation which measured by Dummy Variable for Single Presence Policy (BR=0, before the policy is taken and BR=1, after policy is taken). PLS is abbreviated form for Pooling Least Square. (*) , (**) and (**) indicate significance at 10%, 5% and 1% levels, respectively.

4.5. Discussion

The efficiency of banks in Indonesia as measured by the Standard Profit Efficiency approach (SPEEF) indicates that the foreign banks dominate the more efficient banks. This finding is as same as Jeon *et al*. (2011). After the foreign banks followed by the Regional Development Bank (BPD), national private banks, state-owned banks and joint venture banks, the rising costs such as labor costs and technology are highly relevant to do as long as followed by interest income and other greater income.

Increasing the foreign ownership in domestic banks will impact on reducing the level of banking competition and banking efficiency. Then, the increasing of banking concentration will also lessen the banking efficiency. Foreign banks can make monetary authorities in the world powers in maintaining and securing the financial stability. The incurred costs that entangled the

national governments can reach the total value of more than US$ 1 trillion in debts. The 2008 global financial crisis has taught many national governments to restrict and limit the foreign banks' activities, even the US government (Ercegovac, 2017). Its central bank, The Fed, has recently set the final rule for strengthening supervision and regulation of LFBOs. Such new policy issued is full of controversy although it is with consent by the affected institutions. They claim that the system is very discriminating and incriminating the burdens to comply with The Fed's requirements on capital, debt levels, and annual stress tests.

The conditions borne by the Indonesian central bank have been less convenient as Indonesia has been very dependent on capital influx from offshore accounts. Such accounts are mostly owned by the Indonesian entities and individuals. The reports have been used as the parking, storage of proceeds from international transactions.

Therefore, any attempts to liberalize and reform the banking sector should be considered as restrictive and discriminatory. Barriers to entry regarding strict regulations and tight supervisions serve the functions such as to: protect investors; maintain the financial system and its stability nationwide; control the capital flights (hot money) as it can cause the rupiah fluctuates abrupt; preserve the pool of funds steady and available at a longer time; create the same level of playing field to all players and at the same time; reduce the information asymmetry, and reduce the potential conflicts of interests with the affiliates or not.

5. Conclusion

Bank Indonesia has regulated the existence of foreign banks in Indonesia through its three regulation: first, Decree No.32/37/KEP/DIR dated 12 May 1999 regarding Requirements and Procedures to Open A Branch Office, A Supporting Branch Office, and A Representative Office of A Bank Legalized Offshore. Second, Regulation No.8/16/PBI/2006dated 5 Oct. 2006 regarding Single Presence Policy in Indonesian Banking Industry, which was revoked by and three, Regulation No.14/24/PBI/2012dated 26 Dec. 2012 regarding Single Presence Policy in Indonesian Banking Industry.

Hadad *et al.* (2004) criticized that the first regulation (Decree No.32/37/KEP/DIR) that set the capital requirement for the foreign bank branch can cause the fluctuations of the equity or business funds of the foreign bank. Although it can be beneficial, it is speculative. Such capital requirement has left the foreign bank unable to put its equity as a bumper to anticipate the loss incurred and as a tool to control its asset growth.

Therefore, BI regulation in circular letter No. 154 / D / PNP should be followed up to be legally binding regulations, to control the ownership of domestic's bank stock by the foreign parties and maintain or even increase the efficiency of local banking.

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Appendices

Appendix A. The Impact of Foreign Bank Penetration on Banking Competition and Efficiency

Description	Positive Impact	Source
Competition	Increase banking competition by decrease Net Interest Margin	Claessens *et al.* (2001), Gelos and Roldos (2004), Crystal *et al.* (2002), Barth *et al.* (2001, 2004); La Porta *et al.* (2002), Berger *et al.* (2004), Peria and Mody (2004)
	Increase banking competition through positive spillover effect from foreign bank to domestic bank	Jeon *et al.* (2011)
	Increase competition in short-term	Poshakwale and Qian (2011)
Efficiency	Foreign banks increase efficiency of domestic bank through lowering interest margin, assuming the foreign bank entry in developed countries	Claessen *et al.* (2001), Lensink and Hermes (2004)
	Increase efficiency in short time	Poshakwale and Qian (2011)
	Increase banking efficiency through positive spillover effect from foreign bank to domestic bank, assuming the foreign bank entry in emerging market at the crises period	Lehner and Schinizer (2008)
Description	**Negative Impact**	**Source**
Competition	Lowering banking competition by reducing profit and charter value in the domestic bank.	Claessens *et al.* (2001), Levy-Yeyati *et al*. (2004)
	Lowering competition through increased cost and interest margin, assuming the foreign bank entry in the less developed country.	Claessen *et al.* (2001), Lensink and Hermes (2004)
Efficiency	Foreign bank is more efficient compared to domestic bank and take advantage in host countries through high-interest margin, high profitability, and tax payment, assuming the foreign bank entry in emerging countries	Claessen *et al.* (2001), Lensink and Hermes (2004)
	Decrease domestic bank efficiency through the increasing of domestic banking concentration, and in turn, will increase administration cost and interest margin.	DeYoung and Nolle (1996), Berger *et al.* (2000), Claessens *et al.* (2001), Levine (2003).
	If domestic bank better monitored, foreign bank penetration will worsen the wealth	Detragiache *et al.* (2008)
	Economic border will make foreign bank more inefficient	Buch e*t al*. (2003), Gobbi and Lotti (2004)
	Foreign bank more efficient if the entry in countries which have lack of economic growth and restrict foreign bank penetration.	Chen and Liao (2011)

Appendix B. Measurement of Variables

a. Foreign Bank Penetration (FBP)

Foreign bank penetration is measured by the portion of foreign ownership in the local banks.

b. Banking concentration

Banking Concentration level is measured by Concentration Ratio (We use CR3 and CR5) and HHI (Herfindahl-Hirschman Index).

c. Banking Competition (Comp)

The first market competition level is measured by using the Panzar-Rose approach with the basic models developed by Vesala (1995) and Shaffer (2004). We adjusted the model by adding three other variables, that is EQ (equity to asset ratio), CASH (deposit to cash ratio), and LO (net disbursed loans to assets). This leads to the model formation of Eq.(3).

$$\ln INTR_{it} = \alpha + \beta \ln AFR_{it} + \gamma \ln PPE_{it} + \delta \ln PCE_{it} + \zeta_1 \ln EQ_{it} + \zeta_2 \ln CASH_{it} + \zeta_3 \ln LO_{it} + e \quad (3)$$

whereas,

β, γ, δ, ζ_1, ζ_2, ζ_3 serve as regression coefficients for their respective independent variables.

INTR: ratio of interest earnings to total assets

AFR: ratio of interest expense to total deposits

PPE: ratio of labor expenses per human resources

PCE: ratio of administrative and operational expenses to total assets as the proxy of input price of fixed assets

e : error term

The sum of the first three regression coefficients (β + γ + δ) is to measure the competition level coefficient (H) of the industry. If H is equivalent to 0, statistically, the market structure for the banking industry is a monopoly or collusive oligopoly.

If H is equivalent to 1, statistically, the market structure for the industry is perfect competition or contestable market. If H is not equivalent to 0 and 1, statistically, the market structure is monopolistic.

The second market competition level is measured by using Conjectural Variation approach with the model developed by Angelini and Cetorelli (2003). We adjusted the model by adding "ln(NPL)" as a control variable in the cost equation. The addition is to include the variable of troubled banks in dealing with loan repayments and lowered credit disbursements (Kubo, 2006). This leads to the model formation of Eq.(4).

$$\ln C_i = \beta_0 + \beta_1 \ln q_1 + \frac{\beta_2}{2}(\ln q_i)^2 + \sum_{k=1}^{2} \gamma_k \ln \omega_{k,i} + \sum_{k=1}^{2} \phi_k \ln q_i \ln \omega_{k,i} + \frac{1}{2}\sum_{k=1}^{2} \gamma_{kk}\left(\ln \omega_{k,i}\right)^2 + \gamma_{12} \ln \omega_{1,i} \ln \omega_{2,i} + \rho . \ln(NPL_i) + \varepsilon_i \quad (4)$$

$$R_i = \beta_i C_i + \beta_2 C_1 \ln q_i + \sum_{k=RW}^{2} \emptyset_k \ln \omega_{k,i} + \sum_m \left(\bar{\theta}/\eta\right)_m q_i + v_i \quad (5)$$

whereas,

β, γ, : as estimation parameters

ε, v : error terms

q_i : total loans (credits) disbursed

Ri : interest income

p_i : the ratio of interest income to total credits

NPL $_i$: nonperforming loans

C $_i$: interest expenses and labor expenses

$\omega_{R,i}$: ratio of interest expense to liabilities

$\omega_{W,i}$: ratio of labor expenses per workforce

$\bar{\theta}/\eta$: competition level

m : year of observation

d. Banking Efficiency (EFF)

Banking Efficiency is measured by using Standard Profit Efficiency (Berger and Di Patti, 2006). The Eq.(6) provides estimated profit for each bank. For each year, a bank with the highest profit was set as the benchmark. As Eq.(7) provides calculated efficiency for each bank, its value was then compared with the bank whose value was set as the benchmark by Eq.(6).

$$\ln(\pi + \theta) = f\pi(w, p, z, v) + \ln u\pi + \ln \varepsilon\pi \quad (6)$$

whereas,
π : profit indicators
w : vector to measure input price
z : fixed output
v : other potential economic factors that can affect the performance
you : efficiency measurement
ε : random error term

The efficiency of the banking market is measured by using a model suggested by Berger and Di Patti (2006), that is Standard Profit Efficiency (SPEFF), Eq.(7). SPEFF assumes that the input and output variables are exogenous factors in nature that can affect the profit.

$$SPEFF^{i} = \frac{\hat{\pi}^{i}}{\hat{\pi}^{max}} = \frac{\{\exp[\hat{f}_{\pi}(w^{i}, p^{i}, z^{i}, v^{i})] \times \exp[ln\hat{u}_{\pi}^{i}]\} - \theta}{\{\exp[\hat{f}_{\pi}(w^{i}, p^{i}, z^{i}, v^{i})] \times \exp[ln\hat{u}_{\pi}^{max}]\} - \theta} \quad (7)$$

whereas,
$\ln\hat{u}_{\pi}^{max}$: maximum observe the value of its efficiency term
I : the value of the i-th company

SPEFF is to measure how close for a bank to generate the profit near its predicted value with best practices in dealing with exogenous conditions. The maximum value for the best practice firm is 1. This firm is then set as the benchmarked bank, with the SPEFF value by 1 or 100%.

SPEFF is also defined as a proportion of the maximum of potential profit that can be generated by a bank. A bank with SPEFF value of 0.8 means that the bank can generate profit by 80% of its maximum potential profit.

The efficient bank is indicated by its SPEFF value which is greater or equivalent to 0.8. It means that such bank is capable of generating profit at least 80% of the benchmarked bank.

e. Banking Regulation (BR)

Single Ownership Indonesian Banking Policy No 8/16/PBI/2006 (Bank Indonesia, 2006) is used as policy variable that represents the dummy variable, where SPP= 0 for before 2006 SPP = 1 for period 2006 and after.