

## **The Influence of Banking Competition on a Firm's Cost of and Access to Credit: Evidence from ASEAN-5 Countries**

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### **ABSTRACT**

This research investigates the effect of bank competition on a firm's cost of and access to credit. Previous studies in developed countries found that bank competition increases the cost of credit, which is in line with the information hypothesis. Bank competition also increases a firm's access to credit based on the market power hypothesis. However, the banking industry in developing countries has different characteristics compared to developed countries and this leads to a different result. Using data from ASEAN-5 countries from 2005 to 2016, this study found that the increase of banking competition leads to an easier access for a firm to obtain credit. Increased competition also decreases the cost of credit paid by the firm. We also find that the effect of bank competition on cost of credit is generally influenced by a firm's size and tangibility.

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*Keywords:* bank competition; bank concentration; cost of credit; access to credit

## I. INTRODUCTION

The banking industry has an important role in a country's economic system and banks act as intermediaries between individuals and groups with excess funds and others that need funds. The banking system's main purpose is to increase economic growth and create stability by providing more funds and credit for business and personal use when funds will be used for increasing productivity and the expansion of a business (Were, Nzomoi, and Rutto, 2012). Easier access to obtain credit may result from the level of banking competition within a country, even though there are still many contradictions for this theory or framework about ease of credit and banking level (Fungáčová et al., 2017; Love and Martínez-Pería, 2015). According to Khan et al. (2017), bank competition plays an important role because credit that is given by bank acts as an input to produce a product or service within a country.

According to *World Bank Report* (2005), there was a shift in banking competition in the world during the financial depression from 1970 to 1980 and since financial liberalization in 1990. Noman, Gee, and Isa (2017) state that financial liberalization drives banks from developed countries to operate at low profit margins in order to expand their operation, whereas banks in developed countries operate at a high profit margin. This leads to an increase of competition in many developing countries, especially Southeast Asia. The Asian financial crisis of 1997-1998 and the global financial crisis of 2008-2009 drove the banking industry in ASEAN toward a more concentrated market because of several industry tendencies, such as bank mergers, acquisitions, liquidations, and consolidations were implemented.

In upcoming years, ASEAN will implement a new regulation scheme known as the ASEAN Banking Integration Framework (ABIF) as a part of the ASEAN Economic Community (AEC). The framework has an agenda to create financial integration between all ASEAN members. The implementation of this agenda will result in increased competition in the goods market, labour market, and financial industries, especially banks. ABIF regulation said those banks that meet the criteria as "Qualified ASEAN Banks" have greater access to enter the banking industry in other countries. This will influence the level of competition in every banking industry in each country, which in turn will influence the cost of and access to credit.

Previous research by Wibowo (2016) shows that banking competition in Indonesia from 2000 to 2013 was the lowest compared to Malaysia, Thailand and Philippines. This competition ranking resulted from the high lending rate of Indonesian banks. Rokhim (2017) also provided conclusions that the banking industry in Indonesia was highly concentrated and dominated by only a certain number of players in industries. Khan et al. (2017) also shows that the banking industry in ASEAN from 1995 to 2014 indicated a more concentrated industry as a result of the global financial crisis in 2008-09 and this affected stability of the financial system, economic growth, and access to credit. From previous studies we can conclude that banking competition in ASEAN indicates a concentrated market structure. However, this condition will change with the implementation of ASEAN Banking Integration Framework (ABIF).

This study will examine the effect of bank competition on a firm's access to credit and a firm's cost of credit among ASEAN-5 countries during period of 2005 to 2016. This kind of study has never done before for the Asia Region. As mentioned before, previous study generated various results on the effect of banking competition on cost of

credit and access to credit. Generally, there are two main theories on this issue, namely the information hypothesis theory and market power hypothesis theory. Previous study from Fungáčová et al. (2017) provides concluding remarks that bank competition has a positive relationship with *cost of credit*, which is in line with the information hypothesis theory. Álvarez and Bertin (2016) also provide insight regarding how bank competition has a positive relationship with a firm's financing constraints, which is in line with the information hypothesis. In contrast, a study by Love and Martínez-Pería (2015) provides a contrast conclusion in that they argue bank competition increases a firm's access to credit.

Using annual data from banks and firms in ASEAN-5 countries (Indonesia, Malaysia, Singapore, Thailand, and Philippine) from 2005 to 2016, this study examines the effect of bank competition on cost of credit and access to credit. To measure bank competition, we used three measurements from non-structural approaches called the Lerner Index.

This research provides pragmatic insight to academia, regulators, and firm's management. An understanding of the influence of bank competition on cost of credit and cost of credit can help regulators to see whether the proposed ABIF regulation is the right decision to implement and will bring benefit such as easier access to credit that leads to higher economic growth for a country and the companies within it. For a firm's management, the result of this study provides useful information for them to respond to bank competition within a country, enabling companies to take the best action that will benefit them the most.

This study is divided into five parts as follows. Section II presents the literature review from the variables that used in this study. Section III defines data and methodology that used. Section IV describes the results of analysis and Section V provides conclusions from the research.

## II. LITERATURE REVIEW

The UK Competition Commission (2013) defines competition as a process of rivalry, in which a companies has an incentive to fulfil a consumer's needs with the most effective and efficient way in order to obtain a bigger market share in an industry. Competition may exist in any kind of industry, including the banking industry. Claessens and Laeven (2004) show that banking competition may affect the quality of financial products and innovation in the industry. Moreover, the study of Love and Martínez-Pería (2015) shows that banking competition has an effect on reducing a firm's financing constraints, which also leads to easier access for a firm to obtain credit. When the banking industry experiences fierce competition, it leads banks as market players to relax their financing constraints and provide more credit in order to compete effectively.

There are two approaches when assessing bank competition in the banking industry, which is the structural approach and the non-structural approach. According to the study by Turk-Ariss (2010), the methods and approach used to assess bank competition may affect the result of the research. Bikker and Haaf (2002) argue that the structural approach uses the concentration ratio to explain the impact of market structure on the banking industry with their two measurements, which are *N-Bank Concentration Ratio* and the *Hefindahl-Hirshman Index*. In contrast, the non-structural approach no longer takes market structure into consideration when measuring bank competition;

instead it uses the factors that directly influence a bank's operation when responding to change in supply and demand conditions (Fungáčová, Shamshur, and Weill, 2017). There are two measurements that are set as a non-structural approach, which is the *Lerner Index*, *Boone Indicator*, and *Rosse-Panzar's H-statistics*; only *Lerner Index* will be used in this study.

Fungáčová et al. (2017) in a previous study state that non-structural approaches have recently become more important. This assertion is supported by a study from Berger et al. (2004) and Claessens and Laeven (2004) who argue that competition measurement using structural approaches is less accurate for showing banking competition in that industry. Based on that explanation, only the non-structural approach with the *Lerner Index* is one of the measurements used in this study. *Lerner Index* is one of several measurements from non-structural approaches and basically measures the level of competition in each bank. Demircuc-Kunt and Peria (2010) and Rodríguez-Fernández and Udell (2009) state that the *Lerner Index* is a better measurement compared to HHI and the Panzar-Rosse H-statistic.

As mentioned before, the aim of this study is to investigate the effect of bank competition on access to credit and cost of credit. There are two theories that explain the effect of bank competition on access to credit and cost of credit, which are the market power hypothesis and information hypothesis. The market power hypothesis states that cost of finance will be lower and the efficiency of a banking institution will increase when there is a high level of competition (Love and Martínez-Pería, 2015). According to basic economics theory, if a company has significant market power, they will set a price that will benefit them the most. Banks that have great market power when the competition rate in an industry is low will set a higher *cost of debt* to borrowers. Previous study has shown results suggesting high banking competition will lower the cost of credit rate. Degryse and Ongena (2005) in their study state that *spreads* will be higher in a banking industry characterized by high concentration. From this, the increases in banking competition in an industry will lead to a lower cost of credit and higher access to credit for borrowers.

In contrast, the information hypothesis states that a higher level of competition in an industry will lead to more strict financing constraints faced by a firm and increases the cost of credit to be paid by the firm. This theory states that when banking competition is low in an industry, a bank has an incentive to invest in *relationship lending* in order to alleviate the presence of asymmetric information (Fungáčová, Solanko, and Weill, 2014). Previous research from Petersen and Rajan (1995) indicate that a bank with a higher market power is able to create a long-term relationship with borrowers. This will promote a condition that less banking competition enhances a firm's access to credit because it is easier for the bank to gain advantages from the lending relationship with borrowers (Love and Martínez-Pería, 2015).

Other factors that also affects the cost of credit and access to credit that must be considered are firm-specific variables such as firm size and tangibility and country-specific variables such as inflation, GDP per capita, and rule of law. Many previous studies also consider size as a factor that influences the effect of bank competition on cost of credit (Álvarez and Bertin, 2016; Beck, Demigrüç-Kunt, and Maksimovic, 2004; Carbó-valverde, Rodríguez-fernández, and Udell, 2009; Fungáčová et al., 2017; Love and Martínez-Pería, 2015). Fungáčová et al. (2017) demonstrated with a sample of 20 countries in Europe that firm size and tangibility are factors that affect the influence of

bank competition on the cost of credit. These result in size and tangibility significantly influencing the effect of bank competition on the cost of credit. Beck, Demirgüç-Kunt, and Maksimovic (2008) state that larger firms have greater access to external financing from a bank compared to relatively smaller firms. Moreover, research by Bencheikh and Taktak (2017) conclude that a firm that owns many tangible assets that may be used as lending collateral will have easier access to credit. Previous studies from Fungáčová et al. (2017) also conclude that greater financial and economic development in a country as measured by inflation rate, GDP per capita, and rule of law, enhance the cost of credit and access to credit.

### III. DATA AND METHODOLOGY

The data used in this research consist of banking data, firm-level data, and country-level data. This study uses a sample of listed banks and listed firms in Indonesia, Malaysia, Singapore, Thailand, and the Philippines for the period of 2005 to 2016. The banking data and firm-level data were obtained from Datastream's database and country-level data were obtained from The World Bank's Global Financial Development Database and The World Bank's Worldwide Governance Indicator. In totals, the banking data used are 41 banks in Indonesia, 10 banks in Malaysia, three banks in Singapore, 11 banks in Thailand, and 17 banks in the Philippines. Firm-level data used are 475 firms in Indonesia, 916 firms in Malaysia, 766 firms in Singapore, 678 firms in Thailand and 224 firms in the Philippines. The selection of the sample used was based on the availability of the data. We removed data that had extreme and outlier values.

Since the data used in this research consist of data from many firm with multiple years, the data processing method used is the panel data regression method. Pooled least square, common effect model, and fixed effect model are the three methods used to estimate panel data regression. To determine which methods to use in this research, we used a formal test that consisted of the Chow test and the Hausman test.

In the Chow test, the null hypothesis uses pooled least square and the alternative hypothesis uses fixed effect model. If the p-value is less than 5%, then the fixed effect model was used. The result of the Chow test is shown in Table 1.

**Table 1**  
Chow-test result

Model	Chi-Sq. Statistic	Probability	Regression Model
1	3.42	0.000	<i>Fixed Effect</i>
2	21.89	0.000	<i>Fixed Effect</i>
3	3.31	0.000	<i>Fixed Effect</i>
4	21.81	0.000	<i>Fixed Effect</i>
5	3.31	0.000	<i>Fixed Effect</i>
6	21.39	0.000	<i>Fixed Effect</i>

This study generally has six models that consist of three models with different measurements of competition that assess the effect on *cost of credit* and three models with different measures of competition that assess the effect on a firm's access to credit. Table 1 shows that p-values for all models are lower than the 5% level of significance, thus the model selected based on the Chow test is the fixed effect model.

After performing the Chow test, we also performed the Hausman test with the null hypothesis using the random effect model, and the alternative hypothesis using the fixed effect model. If the p-value was less than 5%, then fixed effect model was used. The result of the Hausman test is shown in Table 2.

**Table 2**  
Hausman-Test Result

Model	Chi-Sq. Statistic	Probability	Regression Model
1	299.98	0.000	<i>Fixed Effect</i>
2	22.51	0.010	<i>Fixed Effect</i>
3	253.25	0.000	<i>Fixed Effect</i>
4	4,062.14	0.000	<i>Fixed Effect</i>
5	184.67	0.000	<i>Fixed Effect</i>
6	384.94	0.000	<i>Fixed Effect</i>

From Table 2, the p-values for all models are lower than the 5% level of significance, thus the model selected based on the Hausman test is the fixed effect model. Previous studies from Fungáčová et al. (2017) also used the fixed effect model in order to control firm-level heterogeneity. Consequently, the regression equation used is as follows:

$$COC_{i,c,t} = \alpha + \beta_1 \text{Bank Competition } c,t + \beta_2 F i, c, t + \beta_3 X c, t + \theta_i + \mu_t + \epsilon_{ict} \quad (1)$$

$$\text{Access}_{i,c,t} = \alpha c + \beta_1 \text{Bank Competition } c, t + \beta_2 F i, c, t + \beta_3 X c, t + \epsilon_{i, c, t} \quad (2)$$

This study has two dependent variables, which are cost of credit and a firm's access to credit. For the independent variable for both models, bank competition in country *c* in year *t* was measured with the *Lerner Index*. This study also includes some control variables that dividend into a firm specific variable such as *Size and Tangibility* and country specific variables, such as *inflation, GDP per Capita, and Rule of Law* that may affect the relation between bank competition on cost of credit and access to credit. Generally, the dependent, independent and control variables that are used in this study are listed below.

## A. Dependent Variables

As mentioned earlier, this study has two dependent variables. First, a firm's cost of credit is used as an indicator to observe the effect of bank competition on the cost of credit that should pair by firm as a borrower. Second, a firm's access to credit is used as an indicator to see the effect of bank competition on a firm's access to credit.

### 1. Cost of Credit

Cost of credit represents cost that should be paid by the firm in order to get external funds that comes from a bank. Cost of credit is one from many factors that determine financing constraints. Lower cost of credit indicates fewer financing constraints faced by the firm. In accordance with a study by Fungáčová et al. (2017), cost of credit is measured by:

$$\text{Cost of Credit}_{i,c,t} = \left( \frac{\text{Financial expenses}}{\text{Total Debt}} \right) - \text{country nominal short-term interest rate} \quad (3)$$

## 2. Access to Credit

A previous study from Love and Martínez-Pería (2015) used data from *The World Bank Enterprise Surveys* to measure firm access to credit, but because the data was incomplete for ASEAN countries, we used a proxy to measure access to credit. We used a proxy from a previous study by Bencheikh and Taktak (2017) with the assumption that a firm not following *pecking order hypothesis* and solely relying on debt to raise funds. The proxy by Bencheikh and Taktak (2017) used a ratio of total debt to total asset as a proxy to measure access a firm's to bank financing.

$$\text{Access to Credit}_{i,c,t} = \frac{\text{Total Debt}}{\text{Total Asset}} \quad (4)$$

## B. Independent Variables

In accordance to Turk-Ariss (2010), the methods and approach used on assessing bank competition may affect the degree of banking competition's influence on cost of credit and access credit. Because of this we use one of the competition measurements from the non-structural approach, which is the *Lerner Index*.

### 1. Lerner Index

The *Lerner Index*, as a non-structural approach on measuring bank competition, is also used by Fungáčová et al. (2017). The *Lerner Index* is measured by the ratio between the difference of mark-up price with marginal cost and mark-up price with the following formula:

$$LI_{i,t} = \frac{P_{i,t} - MC_{i,t}}{P_{i,t}} \quad (5)$$

## C. Control Variables

We use firm-specific variables and country-specific variables to control the influence of banking competition on cost of credit and access to credit. Fungáčová et al. (2017) found that firm-specific variables such as size and tangibility and country-specific variables such as inflation, GDP per capita, and rule of law influence the relationship between bank competition and a firm's cost and access to credit. Therefore, the control variables used in this study are:

1. Firm Size= ln (Total Asset)
2. Tangibility=  $\frac{\text{tangible fixed assets}}{\text{total assets}}$
3. Inflation is measured by the annual change of GDP Deflator.
4. GDP per Capita= ln (GDP per Capita)
5. Rule of Law measures how a citizen in a country abides and obeys laws and rules.

#### IV. EMPIRICAL RESULTS

Table 3 shows the descriptive statistics from the data used in this study. The average  $Access_{i,c,t}$  in ASEAN-5 countries is 21.6% with a standard deviation of 0.1928. This result means that on average total debt of firms in ASEAN-5 countries is 21.6% of their total assets. The average of cost of credit in ASEAN-5 countries is quite low, about 4.6% with standard deviation 0.047. During the observation period, the value of  $LI$  ranges from -0.1706 to 0.8069, with an average of 0.299.

**Table 3**  
Descriptive statistics

Variabel	Mean	Minimum	Maximum	STDV
$Access_{i,c,t}$	0.21651	0	0.99959	0.19285
$COC_{i,c,t}$	0.04667	0.01177	0.73762	0.04706
$LI_{c,t}$	0.29933	-0.17060	0.80698	0.27833
$Size_{i,c,t}$	14.47824	0	26.27574	3.44524
$Tangibility_{i,c,t}$	0.54604	0	0.99999	0.22928
$Inflation_{i,c,t}$	0.03471	-0.00900	0.18149	0.03340
$GDP_{c,t}$	0.04842	-0.02526	0.15240	0.29454
$Rule\ of\ Law_{c,t}$	0.41139	-0.82153	1.83200	0.82997

We performed regressions in order to examine the effect on banking competition on cost of credit and access to credit. First we performed regression for cost of credit models, and the result is shown in Table 4.

**Table 4**  
Regression result for cost of credit

	Dependent Variables = Cost of Credit
	<i>Lerner Index (LI)</i>
$Competition_{c,t}$	0.01591*** (0.00426)
$Size_{i,c,t}$	-0.00527*** (0.00068)
$Tangibility_{i,c,t}$	0.02895*** (0.00298)
$Inflation_{c,t}$	-0.00411 (0.01402)
$LnGDP_{c,t}$	-0.04267*** (0.00747)
$Rule\ of\ Law_{c,t}$	-0.00283 (0.00378)
R <sup>2</sup>	0.02850
N	16.614

\*, \*\*, \*\*\* represents significant level at 15%, 10% and 5%, respectively

According to regression results shown in Table 4, a higher value  $LI$  indicates a high level of concentration and lower level of competition. From the regression result, we can conclude that all the coefficients are significant and positive for *Lerner Index* measurements. We can conclude that higher level of competition as reflected by a lower

value of *Lerner Index* will decrease *cost of credit* that should be paid by borrowers. This result is in line with the *market power hypothesis*. The result contrasts with research by Fungáčová et al. (2017) who argued that bank competition has a positive relationship with cost of credit, as is in line with the *information hypothesis*.

Many previous studies have mentioned that the effect of bank competition on a firm's access to credit has varying conclusions. So, the result in this study is different from the earliest study by Fungáčová et al. (2017) based on a sample of 20 countries in Europe. The difference between the two studies may be due to different countries being used as a sample in which the banking system and firms in ASEAN-5 countries have different features and characteristics compared to their counterparts in Europe. Firm size is also significantly negative and this condition leads to a conclusion that the larger size of a firm will lower the cost of credit. In contrast, tangibility of the asset is significantly positive, which means that the greater amount of tangible assets owned by a company will increase their cost of credit. This result contrasts from previous research because if the firm has a large amount of tangible assets but is not liquid, it will increase the liquidity risk and market risk from that company (Rokhim et al., 2011). Therefore, a bank will charge a higher interest to mitigate that risk and cost of credit will slightly higher. Rule of law are significantly negative, which means that a country that has a better law enforcement will have a lower cost of credit.

After performing the regressions on cost of credit, we also performed regressions on access to credit, and the results are reported in Table 5.

**Table 5**  
Regression result for access to credit

	Dependent Variable= Access to Credit
	<i>Lerner Index (LI)</i>
<i>Competition<sub>c,t</sub></i>	-0.02036** (0.01075)
<i>Size<sub>i,c,t</sub></i>	0.02105*** (0.00214)
<i>Tangibility<sub>i,c,t</sub></i>	-0.52184*** (0.01045)
<i>Inflation<sub>c,t</sub></i>	0.14545*** (0.03389)
<i>LnGDP<sub>c,t</sub></i>	-0.04504*** (0.01464)
<i>RuleofLaw<sub>c,t</sub></i>	0.00104 (0.09343)
R <sup>2</sup>	0.44190
N	29.968

\*, \*\*, \*\*\* represents significant level at 15%, 10% and 5%, respectively

According to regression results shown in Table 5, the higher value of the *Lerner Index* also denotes a high level of concentration and lower level of competition. From the regression result, we can see from the table that the coefficients are negative and significant with the *Lerner Index* measurement. We can conclude that the higher level of competition that is reflected by a lower value of the *Lerner Index* will increase a firm's access to credit, and this condition is also in line with the *market power hypothesis*. The

result in this study is in line with research that was conducted by Love and Martínez-Pería (2015) that used a sample of 53 countries demonstrating that bank competition will alleviate credit constraints and make it easier for a firm to access credit from the banking industry. The reason why bank competition will increase a firm's access to credit is because bank competition will drive the banking industry and related market players to keep on making improvements and expansions in order to compete successfully in the market by increasing credit access and lowering the cost to obtain credit.

Firm size is also significantly positive and this condition leads to a conclusion that larger firms will escalate access to credit. In contrast, tangibility of the asset is significantly negative, which means that more tangible assets owned by a company decreases the amount of credit that is available for the firm. As mentioned before, this condition results because the large amount of tangible assets owned will expose the firm to higher liquidity and market risk, so that the access to credit will be slightly lower. Rule of law are not significant, which means that law enforcement does not have an influence on cost of credit.

## V. CONCLUSION

This study investigates the effect of banking competition on a firm's cost and access to credit. Several previous studies have shown various conclusions, where some studies conclude that bank competition has a positive effect on cost of credit and lower access to credit according to the information hypothesis, whereas other previous studies conclude that bank competition has a negative effect on cost of credit and higher access to credit in accordance with the market power hypothesis.

Using the data from banks and firms from ASEAN-5 countries (Indonesia, Malaysia, Singapore, Thailand and the Philippines) from 2005 to 2016, this study shows that bank competition has a negative effect on cost of credit, where a higher level of competition as shown by a lower value *Lerner Index* lowers the cost of credit. This result is in line with the market power hypothesis. This study also concludes that bank competition has a positive effect on a firm's access to credit in accordance with the market power hypothesis. If competition in the banking industry becomes fierce, each bank will improve their service and provide higher access to credit in order to compete successfully in the industry. This study also found that size, tangibility and rule of law that prevail in a country influences the effect of bank competition on a firm's cost of and access to credit.

The take-away lesson from this study is that the implementation of the ASEAN Banking Integration Framework will enhance a firm's access to credit and lower the cost of credit. This condition will lead to an increase of economic growth within a country. Therefore, this policy is a good regulation to implement. From this study, we learnt that a company has an opportunity to increase their credit for expansion or productive activity that results from an easier access to credit when competition is high. In addition, this study has a few limitations to improve further research, such as the assumption that used to measure a firm's access to credit and used a sample from all banks and firms that exist in a country, not only firms and banks that are listed.

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