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Does Cross-Border-Establishment Improve Competition and Performance of Indonesia's Financial Sector?

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ABSTRACT

This study examined the effects of cross-border establishment of financial institutions on competition level in Indonesia's financial sector. Sample data was used in all conventional banks, securities firms, life and general insurance companies from 2013-2020. To measure competition, Lerner index, Boone indicator and Panzar-Rosse were used. Our analysis shows that the entry of foreign financial institutions may increase the competition in the financial sector. Further analysis shows that the increasing competition has a positive impact on profitability and intermediation, reflected by the return on asset, loan ratio, transaction value, and insurance premium income to total asset ratio. However, foreign financial firms tend to have higher market power compared to domestic counterparts due to the efficiency in doing their businesses. Hence, domestic financial institutions need to boost efficiency, particularly through the adaption of technology and capacity enhancement of human resources, in order to compete with more advanced foreign financial firms.

Keywords: Cross border establishment, Competition, Profitability, Intermediation, Indonesia.

JEL Classification: G20, C14, L11

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1. Introduction

The presence of foreign financial institutions in Indonesia has increased sharply due to the country's financial deregulation policy during 1983-1993. In October 1988, the Government of Indonesia issued a policy package that relaxed restrictions on entry to enhance efficiency in the banking sector by increasing competition. Restrictions on the activities of foreign banks were also relaxed. New foreign banks were allowed to create joint ventures with domestic banks with maximum share of 85 per cent foreign ownership. These financial deregulations were also applied to the capital market and insurance industries.

The financial deregulation measures were thus aimed at enhancing competition through a greater reliance on market forces, thus promoting the growth and deepening of financial markets, encouraging the domestic financial market to become more integrated with international financial centers and decreasing the segmentation in the financial sector. It was judged that a competitive financial system would improve efficiency, encourage domestic saving mobilization, reduce the cost of intermediation, and increase the efficiency of allocation of financial resources in the economy (Titin, 1995).

In order to improve market access and to protect national interests, Indonesia currently has an International Trade Agreement both in the form of ASEAN trade cooperation and bilateral trade agreements between Indonesia and other countries. It encourages the establishment of a Cross Border Establishment of Financial Services Institutions to provide financial products and services to support trade activities between countries.

Under ASEAN Framework Agreement on Services (AFAS), there is a plan for financial integration in ASEAN through three stages, namely liberalization, facilitation and harmonization. Financial sector liberalization in ASEAN means opening up of the financial services among countries in the region. Facilitation provides platforms to enable greater trade in services and to reduce unnecessary trade costs. Harmonization involves greater coordination of policy and regulatory framework.

There are four modes of delivery of services based on General Agreement on Trade in Services (GATS). First, cross-border supply, where the provision of services across national borders and service providers and consumers are not in one country, e.g., telemedicine transactions. Second, consumption abroad, in which consumers are travelling to the place of service provision, such as medical tourism. Third, commercial presence through foreign direct investment in affiliated companies, subsidiaries or representative offices of companies

established in the other country. The example of this mode is cross border establishment of financial institutions. Lastly, movement of natural persons, which means temporary transfer of natural persons to work for service providers in other countries as expatriates. The commitment of Indonesia for the liberalization of financial services is in mode 3, in the form of cross-border establishment.

Cross-Border Establishment (CBE) is the formation of branches or subsidiaries of entities in other countries or regions. In the financial services sector, one of the CBE activities is through cross-border banking, securities and insurance. Cross-border activities in financial industry, in addition to providing benefits for financial stability can also play a significant role in supporting real sector activities. This includes international trade as well as economic diversification and creating competitive markets. Although the outlook of some international institutions that predict foreign direct investment globally to fall by 30%-40% due to the pandemic, the value of foreign investment in Indonesia throughout 2020 only decreased by -2.4%. This indicates that there is still a great interest of foreign investors to keep investing in Indonesia.

There have been many theories and empirical evidence that show the benefits of cross-border financial activities for emerging economies, such as facilitating international trade, increasing diversity and competition in the national financial system, providing credit access with tighter spreads, and enhancing innovation and product value. Many foreign financial institutions have used digital business models, so as to encourage local financial firms to increase investment into digital technology to win the competition. A CBE can also improve financial resilience through diversification of assets and liabilities, allowing financial firms to expand asset diversification and divide its risk into other regions. This can lower a firm's exposure to a country's economic cycle.

There are potential risks, benefits, and opportunities arisen from CBE in financial industry. The potential risks that need to be anticipated such as the risk exposure from host country, potential price war, and the threat to domestic financial institutions growth. On the other hand, CBE can also bring potential benefits to domestic financial system through knowledge and technology transfer, while strengthening domestic financial capacity. It can bring potential opportunities abroad in terms of strengthening domestic businesses abroad and becoming a bridge for Indonesia in the flow of trade, capital, and talent.

CBE also allows Indonesia’s financial institutions to establish branches and/or subsidiaries abroad, which can have a positive impact on Indonesian economy through foreign exchange obtained when foreign branch offices

offering credit to Indonesian exporters, or as remittance agents receiving remittances by Indonesian workers abroad. CBE also allows Indonesia's financial institutions to be able to capture business opportunities, not only to meet the business expansion needs of customers abroad (outbound flow), but also to capture inbound flow of investment to Indonesia through direct investment and capital market investment instruments. This was conducted by Bank Mandiri Singapore Branch which has collaborated with its asset management to develop wealth management business in the ASEAN region.

TABLE 1
Number of Domestic and Foreign Financial Institutions in Indonesia (2013-2020)

Financial Institutions	2013	2020
Banks		
Foreign	29	36
Domestic	71	59
Securities Companies		
Foreign	30	26
Domestic	73	65
General Insurance		
Foreign	18	20
Domestic	58	53
Life Insurance		
Foreign	18	23
Domestic	22	23

This study aims to measure the impact of CBE to competition in Indonesia's financial services sector that include banks, securities firms, as well as life and general insurance companies. Three indicators of the competition level are estimated so the different aspects of the competition can be captured. Lerner index measures the individual financial institution's market power to set up the price in the market, assuming price is fixed (static market power). Panzar-Rosse H-statistic measures competition as speed of input prices transmission to firm's income level. Boone indicator measures competition that capture the market dynamics. Due to each measure showing different aspects of competition, those three measures may produce different results. The other objective of this study is to determine the impact of CBE to the profitability and intermediation in Indonesia financial industry. Finally, the study assesses the interlinkages among competition, firm's profitability, and its intermediation using GDP and inflation as controlling variables.

The remainder of this paper is organized as follows. Section 2 discusses the relevant literature on competition, CBE and financial institution performance in terms of profitability and intermediation. Section 3 presents data and methodology that are employed to measure both competition and performance, as well as estimation techniques we have used to assess how they are affected by cross-border activities. Section 4 presents and discusses the empirical findings. Finally, section 5 provides concluding remarks.

2. Literature Review

There have been studies conducted on cross border establishment (CBE) in the financial sector, in which most focus on cross border banking in many countries. Lozano-Vivas and Weill (2012) asserted that in European banking market the impact of Cross Border Banking (CBB) on competition depends on the entry mode, by either establishes branch or subsidiary or through merger and acquisition (M&A). Recent study using data in 18 OECD's countries showed that higher volumes of cross-border lending result in a higher degree of competition (Bremus, 2015).

The result on how foreign company affects competition in the market is determined in the existing literature that also finds that foreign bank entry improves competition in Latin America and Asian emerging markets and in terms of spillovers, more efficient banks have stronger effects on competition (Jeon et al., 2011) Empirical evidence also shows that in emerging markets, foreign banks are more profitable and more efficient than domestic banks (Demirguc-Kunt and Huizinga, 2000; Bonin at al., 2005; Martinez Peria and Mody, 2004), while being less profitable in more developed countries (Claessens et al., 2001).

There was a study by Léon (2016) assessing the impact of African CBB on competition in the banking industry using different competition measurement including Lerner index, Boone indicator, and Panzar-Rosse H-statistic. The result showed that the competition trend increased during the study period was being observed, it was caused mainly by the expansion of African CBB. Another research examined the influence of competition on soundness of Croatian insurers, using Boone Indicator as proxy to measure competition. Based on Boone indicator, it showed that after joining the EU there was an increase of the competition in Croation insurance industry, which led to the increasing of efficiency that was reflected by lower average cost and higher return on asset (ROA) (Tomislava, and Marko Miletic, 2019).

Dimasqy, et. al. (2020) also had assessed the influence of liberalization on innovation, performance, and competition levels of insurance industry in Indonesia, based on insurance data from 2006 to 2018. The study indicated that in the aggregate, global insurance financial liberalization had had a significant impact on the development of the insurance industry sector in Indonesia. However, the impact of liberalization could be different for small insurance companies and large insurance companies. Due to the availability of resources, large insurance companies could optimize the adaptation of liberalization in terms of innovation. On the other hand, there was a negative impact of liberalization to small companies with low premium income. As consequence of liberalization, insurance companies had to pay more attention to innovation, significantly improving the quality of human resources as a competitive advantage in facing global competition.

In terms of competition measurement, there are three common proxies used in several studies namely Boone indicator, Lerner index, and Panzar-Rosse H-statistics. Each measurement provides a slightly different information and aspect of the existing competition in an industry, even though each of measurement has common approach to measure the level of competition (Degryse et al., 2009). Boone (2008) built a competition indicator based on a basic idea that the efficient firms will benefit more in a competitive market. More efficient the firms, more superior their performance compared to their competitors. Boone indicator as a measure of competition has been commonly used in banking research (Delis, 2012; Tabak et al., 2012; Schaeck, et.al, 2009).

Another competition proxy, Lerner index measured each financial institution's degree of competitiveness. Lerner Index measured firm's ability to keep the product price always above marginal cost. The marginal cost of each financial institution was obtained by estimating the firm cost function with three input factors: the cost of labor, physical capital costs, and cost of funds. Lastly, Panzar and Rosse (1987) developed a competition measurement model by estimating how much the difference of average price set up by existing companies in the industry compared to the pricing strategy of a perfectly competitive market. Bikker and Haaf (2000) examined competition of the banking sectors in the 23 countries using Panzar-Rosse approach, the results indicated that majority of banking industries in the world can be categorized as a monopolistic competition market.

Bikker and Spierdijk (2008) stated that the competition encourages banks to minimize costs so as to sell services at a cheaper price and generate higher profit. Banks which are efficiently managed will beat inefficient banks and are able to generate consistent profits so that its assets and its market share

continues to grow. The concentration of the industry would be even higher in the banking industry with a high degree of competition (De Jonghe and Vennet, 2008).

Some experts asserted studies about relationship between competition on financial industry performance and intermediaries. Moudud-Ul-Huq et al (2020) suggested that profitability significantly affected competition level. On the other hand, the result was similar to Tan and efficiency of the financial industry in opposing position from above hypothesis. Competition actually drives to lower firm efficiency. Hope (2013) found that there was a positive relationship between market forces as measured by the Lerner index and ROA. The positive influence showed that the higher competition between banks further improves the bank's performance, because the high Lerner index indicates low competition, the regression results show that lower competition is associated with higher profitability.

3. Research Methods

A. Data

This research used annual financial reports data from four financial service sectors: 102 conventional banks, 111 securities firms, 53 life insurances and 79 general insurances in Indonesia from 2013 to 2020 provided by Otoritas Jasa Keuangan (OJK). Our sample consisted of foreign and local companies. We decided to measure impact of competition on financial service institutions' (banks, securities companies, life insurance and general insurance) performance and intermediaries by using Lerner Index, Panzar-Rosse, and Boone indicator as proxies for competition which were used by previous researchers (Huq et al., 2020). In term of intermediaries, for each sector, we applied different measurement, as follows: (a) ratio of credit-to-total asset for bank, (b) transaction value-to-total asset for securities companies; and (c) premium-to-total asset for insurance. Other variables are Zscore - to determine the stability and risk within each institution and Size to analyze its impact to both dependent variable (ROA and Intermediaries). Furthermore, it is assumed that macroeconomic indicators would also affect financial institutions' performance and intermediaries including gross domestic products (GDP) and inflation that we collected from Indonesia Central Bureau of Statistics (Badan Pusat Statistik/BPS) website. Detail formula to measure competition variables will be explained on the next paragraphs.

1. Lerner Index

Lerner index is a proxy to measure competition level or market power an industry with a non-structural approach. This method has been used as standard for calculating market power by some economists (Blair and Sokol, 2014). Lerner index estimates market power by subtracting market price (P) by marginal cost (Marginal Cost). This is the equation for calculating Lerner Index.

$$L_{it} = \frac{P_{it} - MC_{it}}{P_{it}} \tag{1}$$

P_{it}: total income to total asset of industry i in time t
MC_{it}: marginal cost of industry i in time t

Marginal cost determines by trans log cost function:

$$\begin{aligned}\log(C_{it}) = \alpha &+ \beta_1 \log(Q_{it}) + \beta_2 (\log(Q_{it}))^2 + \beta_3 \log(W_{1,it}) + \beta_4 \log(W_{2,it}) + \beta_5 \log(W_{3,it}) \\ &+ \beta_6 \log(Q_{it}) \log(W_{1,it}) + \beta_7 \log(Q_{it}) \log(W_{2,it}) + \beta_8 \log(Q_{it}) \log(W_{3,it}) \\ &+ \beta_9 (\log(W_{1,it}))^2 + \beta_{10} (\log(W_{2,it}))^2 + \beta_{11} (\log(W_{3,it}))^2 \\ &+ \beta_{12} \log(W_{1,it}) \log(W_{2,it}) + \beta_{13} \log(W_{2,it}) \log(W_{3,it}) \\ &+ \beta_{14} \log(W_{1,it}) \log(W_{3,it}) + \sum_{j=2}^{T} \gamma_j D_j + \varepsilon_{it}\end{aligned} \tag{2}$$

C_{it}: total cost of industry *i* in time *t*;
Q_{it}: total asset of industry *i* in time t;
$W_{1,it}$: interest expense to total liabilities of industry *i* in time *t*;
$W_{2,it}$: labor expense to total asset of industry *i* in time *t*;
$W_{3,it}$: administration expense and other operational expense to total asset of industry *i* in time *t*;
D_i: dummy variable.

The estimation of Lerner list is zero (0), it shows less market power but highly competitive. On the other hand, if value of Lerner Index closes to one (1), it explains that market power will be more and less competitive. This measurement is very common to use for bank industry. However, in this research we used this proxy to measure competition level on bank, securities firm, life insurance and general insurance. Hence, we adjusted some formula that fit with each industry accounts.

2. Boone Indicator

The Boone (2008) indicator is used to measure competition. Compared to other methods, this measurement has a superiority in estimating competition for certain product markets and for different industry categories. Coefficient β of Boone Indicator is expected to be negative, it indicates higher market competition.

$$\log(S_{it}) = \alpha + \beta \log(MC_{it}) + \sum_{j=2}^{T} \gamma_j D_j + \varepsilon_{it} \quad (3)$$

S_{it}: share asset to total market;
MC_{it}: marginal cost;
D_j: dummy variable;
e_{it}: idiosyncratic error.

3. Panzar-Rosse

Panzar-Rosse approach determines market competition to classify the market into monopolistic, monopoly or oligopoly, and perfect competition. Nicholson and Synder (2010), based on perfect competition market theory explain that a company is experiencing zero economic profit with a price level equal to the level of marginal cost and average cost (P=MC and P=AC). Increasing value of expense will increase price and revenue. The value of H-statistic = 1 means perfect competition market; 0<H<1 means monopolistic market, and $H \leq 0$ shows the market monopoly and oligopoly (Panzar and

Rosse ,1987). The value of H-statistic closer to 1 means market is more competitive.

	Monopoly and oligopoly
H-Statistic ≤ 0	
H-Statistic = 1	Perfect Competition
0 < H-Statistic < 1	Monopolistic competition

The estimation of this approach as follows:

$$\log(R_{it}) = \alpha + \beta_1 \log(W_{1,it}) + \beta_2 \log(W_{2,it}) + \beta_3 \log(W_{3,it}) + \gamma \log(Q_{it}) + \sum_{j=2}^{T} \delta_j D_j + \varepsilon_{it} \quad (4)$$

H-statistic value is sum of β from the estimation:

$$H^r = \beta_1 + \beta_2 + \beta_3 \quad (5)$$

R_{it}: revenue;
Q_{it}: total asset of industry i in time t;
$W_{1,it}$: interest expense to total liabilities of industry i in time t;
$W_{2,it}$: labor expense to total asset of industry i in time t;
$W_{3,it}$: administration expense and other operational expense to total asset of industry i in time t;
D_j: dummy variable;
e_{it}: idiosyncratic error.

4. Research *Model*

This research adopted regression panel data fixed effect after done several tests including Breausch & Pagan LM Test and Hausman test. The estimation is applied to all financial institution including bank, securities competition, life insurance and general insurance. There are two models in this research:

1) Profitability as dependent variable:

$$\text{Profitability}_{i,t} = a + \beta 1\text{Competition}_{i,t} + \beta 2 Size_{i,t} + \beta 3 ZScore_{i,t} + \beta 4\text{Inflation}_{i,t} + \beta 5\text{GDP}_{i,t} + \text{e}_{,i,t} \quad (6)$$

2) Intermediaries as dependent variable:

$$\text{Intermediaries}_{i,t} = a + \beta 1\text{Competition}_{i,t} + \beta 2 Size_{i,t} + \beta 3 ZScore_{i,t} + \beta 4\text{Inflation}_{i,t} + \beta 5\text{GDP}_{i,t} + \text{e}_{,i,t} \quad (7)$$

Profitability is dependent variables represents' performance from each industry with proxy by ratios ROA. Other dependent is intermediaries measured by credit-to-total asset for bank, transaction value-to-asset for security companies, and premium-to-total asset for insurance company. For independent variable, Lerner Index is used to measure the level of market power. In addition, for control variables size and Zscore are used. Lastly, macroeconomics variables are gross domestic product and inflation.

5. Empirical Results and Discussion

We examined the impact of competition on profitability and intermediaries in financial service industry namely bank, securities company, life insurance and general insurance in Indonesia within 2013-2020 period of time. All estimations were tested over 102 conventional banks, 111 securities firms, 53 life insurances and 79 general insurances. The summary of descriptive statistics and correlation matrix are presented in TABLE 2 to 13.

TABLE 2
Descriptive Statistics of Variables Bank

	Definition	Obs	Mean	Std.Dev	Min	Max
Return on Asset (ROA)	Earning after tax to total asset	790	0.021	0.021	0.001	0.283
Intermediation	Credit to total asset	790	0.498	0.133	0.003	1.085
Lerner Index	$\frac{(Price - MC)}{Price}$	790	0.104	0.213	-0.757	0.649
Zscore	$\frac{ROA + E/TA}{\sigma ROA}$	790	9.459	8.323	0.679	124.922
Size	natural logarithm of total assets	790	30.764	1.692	25.278	35.923
GDP	natural logarithm of gross domestic product	790	36.798	0.101	36.638	36.932
Inflation	annual rate of inflation	790	0.043	0.024	0.017	0.084

TABLE 3
Correlation Matrix Bank (ROA as dependent variable)

	ROA	LERNER	SIZE	ZSCORE	GDP	INFLATION
ROA	1					
LERNER	0.1656	1				
SIZE	-0.0309	0.2759	1			
ZSCORE	0.1203	-0.1403	-0.4444	1		
GDP	-0.0226	-0.1013	0.1613	-0.1949	1	
INFLATION	0.0215	0.1165	-0.1371	0.1118	-0.844	1

TABLE 4
Correlation Matrix Bank (Intermediaries as dependent variable)

	KREDIT_RATIO	LERNER	SIZE	ZSCORE	GDP	INFLATION
KREDIT_RATIO	1					
LERNER	0.1837	1				
SIZE	-0.2415	0.2759	1			
ZSCORE	0.1099	-0.1403	-0.4444	1		
GDP	-0.1302	-0.1013	0.1613	-0.1949	1	
INFLATION	0.1113	0.1165	-0.1371	0.1118	-0.844	1

TABLE 5
Descriptive Statistics of Variables Securities Company

	Definition	Obs	Mean	Std.Dev	Min	Max
Return on Asset (ROA)	earning after tax to total asset	757	0.027	0.053	-0.146	0.308
Intermediaries	transaction value to total asset	757	68.396	56.425	0.001	243.248
Lerner Index	$\frac{(Price - MC)}{Price}$	757	0.134	0.342	-0.989	0.919
Zscore	$\frac{ROA + E/TA}{\sigma ROA}$	757	9.251	3.409	0.747	19.212
Size	natural logarithm of total assets	757	26.444	1.086	24.068	29.475
GDP	natural logarithm of gross domestic product	757	36.781	0.098	36.638	36.932
Inflation	annual rate of inflation	757	0.047	0.024	0.027	0.084

TABLE 6
Correlation Matrix Securities Company (ROA as dependent variable)

	ROA	LERNER	SIZE	ZSCORE	GDP	INFLATION
ROA	1					
LERNER	0.3939	1				
SIZE	0.3156	0.2745	1			
ZSCORE	0.3185	0.0186	-0.2824	1		
GDP	-0.0986	-0.0292	0.1292	-0.0877	1	
INFLATION	0.114	0.0173	-0.1227	0.1162	-0.8428	1

TABLE 7
Correlation Matrix Securities Company
(Intermediaries as dependent variable)

	NT_RASIO	LERNER	SIZE	ZSCORE	GDP	INFLATION
NT_RASIO	1					
LERNER	0.1611	1				
SIZE	0.1188	0.2761	1			
ZSCORE	-0.1095	0.021	-0.2728	1		
GDP	0.0757	-0.0315	0.1287	-0.0867	1	
INFLATION	-0.0179	0.0203	-0.1185	0.1186	-0.8422	1

TABLE 8
Descriptive Statistics of Variables Life Insurance

	Definition	Obs	Mean	Std.Dev	Min	Max
Return on Asset (ROA)	Earning after tax to total asset	342	-0.018	0.128	-0.831	0.382
Intermediaries	Premium to total asset	342	0.407	0.301	0.000	2.119
Lerner Index	$\frac{(Price - MC)}{Price}$	342	0.016	0.277	-0.928	0.806
Zscore	$\frac{ROA + E/TA}{\sigma ROA}$	342	2.520	1.897	-2.839	8.372
Size	natural logarithm of total assets	342	14.841	1.705	11.531	18.089
GDP	natural logarithm of gross domestic product	342	36.806	0.099	36.638	36.932
Inflation	annual rate of inflation	342	0.042	0.023	0.017	0.084

TABLE 9
Correlation Matrix Securities Life Insurance (ROA as dependent variable)

	ROA	LERNER	SIZE	ZSCORE	GDP	INFLATION
ROA	1					
LERNER	0.6876	1				
SIZE	0.3381	0.4736	1			
ZSCORE	0.2776	-0.0956	-0.4257	1		
GDP	0.0378	0.1621	0.1553	-0.0941	1	
INFLATION	-0.0157	-0.1369	-0.1289	0.0934	-0.8372	1

TABLE 10
Correlation Matrix Life Insurance (Intermediaries as dependent variable)

	RASIO_PREMI	LERNER	SIZE	ZSCORE	GDP	INFLATION
RASIO_PREMI	1					
LERNER	0.1223	1				
SIZE	-0.0079	0.4724	1			
ZSCORE	-0.246	-0.0954	-0.4263	1		
GDP	-0.0093	0.1634	0.1571	-0.0991	1	
INFLATION	0.0213	-0.1383	-0.1307	0.0987	-0.8352	1

TABLE 11
Descriptive Statistics of Variables General Insurance

	Definition	Obs	Mean	Std.Dev	Min	Max
Return on Asset (ROA)	Earning after tax to total asset	576	0.029	0.046	-0.198	0.282
Intermediaries	Premium to total asset	576	0.274	0.194	0.010	3.136
Lerner Index	$\frac{(Price - MC)}{Price}$	576	-0.059	0.260	-0.900	0.543
Zscore	$\frac{ROA + E/TA}{\sigma ROA}$	576	9.103	3.787	-3.782	21.014
Size	natural logarithm of total assets	576	13.668	1.174	11.487	16.730
GDP	natural logarithm of gross domestic product	576	36.801	0.100	36.638	36.932
Inflation	annual rate of inflation	576	0.043	0.024	0.017	0.084

TABLE 12
Correlation Matrix Securities General Insurance (ROA as dependent variable)

	ROA	LERNER	SIZE	ZSCORE	GDP	INFLATION
ROA	1					
LERNER	0.4823	1				
SIZE	0.1441	0.4466	1			
ZSCORE	0.3571	-0.1146	-0.332	1		
GDP	-0.094	0.1079	0.1847	-0.0651	1	
INFLATION	0.0746	-0.1307	-0.1568	0.0395	-0.8398	1

TABLE 13
Correlation Matrix Securities General Insurance
(Intermediaries as dependent variable)

	PREMI_RATIO	LERNER	SIZE	ZSCORE	GDP	INFLATION
PREMI_RATIO	1					
LERNER	0.1282	1				
SIZE	-0.0457	0.4466	1			
ZSCORE	0.0453	-0.1146	-0.332	1		
GDP	0.0035	0.1079	0.1847	-0.0651	1	
INFLATION	-0.0068	-0.1307	-0.1568	0.0395	-0.8398	1

Lerner Index, Boone Indicator and Panzar-Rosse are used to measure competition or market power. The result is represented in TABLE 14 to 16.

Table 14
Financial Services Industry Competition/Market Power based on Lerner Index 2013-2020

Year	Banks			Security Companies			Life Insurance			General insurance		
	Industry	Domestic	Foreign	Industry	Domestic	Foreign	Industry	Domestic	Foreign	Industry	Domestic	Foreign
2013	0.16	0.15	0.17	-0.01	-0.09	0.19	-0.21	-0.22	-0.21	-0.31	0.80	-0.40
2014	0.13	0.12	0.18	-0.22	-0.24	-0.15	-0.33	-0.43	-0.19	-0.22	-0.17	-0.37
2015	0.09	0.10	0.08	-0.23	-0.26	-0.14	-0.19	-0.15	-0.03	-0.11	-0.11	-0.11
2016	0.09	0.11	0.07	0.02	0.04	-0.02	-0.16	-0.15	-0.18	-0.08	-0.09	-0.03
2017	0.11	0.11	0.12	0.04	0.07	-0.03	0.04	-0.07	0.15	-0.10	-0.13	-0.03
2018	0.08	0.11	0.03	-0.02	-0.04	0.02	0.00	-0.05	0.05	-0.07	-0.09	-0.03
2019	0.09	0.08	0.13	-0.37	-0.45	-0.18	0.02	-0.05	0.10	-0.12	-0.10	-0.16
2020	0.07	0.07	0.08	-0.35	-0.35	-0.36	-0.07	-0.29	0.14	-0.09	-0.15	0.06

TABLE 15
Financial Services Industry Competition based on Boone Indicator 2013-2020

Year	Banks			Security Companies			Life Insurance			General insurance		
	Industry	Domestic	Foreign	Industry	Domestic	Foreign	Industry	Domestic	Foreign	Industry	Domestic	Foreign
2013	-0.63	-0.90	-0.60	-0.01	-0.06	-0.31	-0.45	0.60	-1.33	-1.05	-1.15	-0.84
2014	-0.53	-1.29	0.36	-0.15	-0.32	-0.11	0.20	0.39	-1.48	-0.49	-0.57	0.24
2015	-0.65	-1.65	0.04	0.14	0.02	-0.78	-1.13	-0.25	-1.45	-0.60	-0.59	-0.31
2016	-0.55	-1.44	-0.15	-0.07	-0.25	-0.37	-0.79	0.39	-1.46	-0.77	-0.75	-0.53
2017	-1.11	-1.99	-0.29	-0.14	-0.13	-0.38	-0.36	1.14	-1.09	-0.65	-0.81	-0.06
2018	-0.95	-1.71	-0.22	0.08	0.05	-0.62	-0.87	0.49	-0.90	-0.63	-0.65	-0.23
2019	-0.57	-1.10	-0.27	-0.16	-0.26	-1.17	-1.06	-0.12	-0.77	-0.50	-0.64	-0.01
2020	-0.36	-0.60	-0.27	-0.06	-0.26	-0.55	-1.14	-0.08	-0.89	-0.53	-0.35	-0.43

Table 16
Financial Services Industry Competition based on Panzar-Rosse 2013-2020

Year	Banks			Security Companies			Life Insurance			General insurance		
	Industry	Domestic	Foreign	Industry	Domestic	Foreign	Industry	Domestic	Foreign	Industry	Domestic	Foreign
2013	0.87	0.85	0.85	0.62	0.58	0.73	0.89	0.76	0.95	0.91	0.90	0.74
2014	0.84	0.76	0.95	0.65	0.61	0.76	0.88	0.97	0.66	0.94	0.98	0.74
2015	0.91	0.90	0.95	0.81	0.84	0.65	0.63	0.61	0.71	0.92	1.00	0.67
2016	0.81	0.94	0.76	0.64	0.64	0.64	0.86	0.79	1.10	0.84	1.03	0.54
2017	0.79	0.95	0.73	0.86	0.97	0.68	0.80	0.58	0.91	0.85	0.92	0.76
2018	0.86	0.92	0.75	0.72	0.76	0.72	0.93	0.76	0.82	0.89	1.04	0.65
2019	0.77	0.99	0.75	1.03	1.12	0.51	0.47	0.25	0.88	0.87	0.98	0.57
2020	0.74	0.81	0.76	0.67	0.74	0.67	0.85	0.76	0.93	0.97	1.08	0.82

Based on result of Lerner index explained on TABLE 14, for bank industry competition, trend in the industry increased from 0.16 in 2013 to 0.07 in 2020. This result aligned with Lerner Index trend in foreign banks. In Lerner Index

measurement the higher value means less competitive but has market power and vice versa. The result of Lerner index in security companies showed market power in foreign company was higher compared to domestic in 2013-2016 and 2018-2020. However, Lerner index value in 2016-2018 showed that domestic firms are above foreign company. For Lerner Index in life insurance for foreign life insurance was higher than domestic. It means that the marker power of foreign life insurance was higher than domestic. In addition, the number of Lerner Index on general insurance slightly different. From 2013 to 2015, Lerner Index for domestic company above foreign company. In contrary, over period 2015-2020 foreign company showed higher value of Lerner Index. In general, the trend of competition level of foreign financial institutions is increasing. It may become a positive pushing factor for domestic financial institutions to be able to increase their competition level through optimizing cost efficiency.

We assessed Boone Indicator and Panzar-Rosse to confirm about competition level within each of industry that presented on table 15 and 16. Boone Indicator used to measure of degree of competition based on profit-efficiency. It is calculated as the elasticity of profits to marginal costs. An increase in the Boone indicator implied a deterioration of the competitive conduct of financial intermediaries (Martin Čihák et al., 2012). Furthermore, Panzar-rosse examines market in each of industry. Based on our calculation for both proxies, we can analyze that market in banks, securities companies, life insurances and general insurance are relatively competitive. It shows from the value of Boone Indicator is negative and the result of Panzar-Rosse proxy mostly positive.

TABLE 17 shows the result of our regression on banks. First model shows variable competition, Z-score and Gross Domestic Product (GDP) presenting a positive and significant on ROA. On the other hand, size displayed a negative significant and inflation showed negative insignificant. The estimation result of second modelling intermediaries as dependent variable showed competition positive and significant outcome, meanwhile at the same time size and GDP negative significant on intermediaries. However, inflation remained the same with previous model that showed negative insignificant on intermediaries.

TABLE 18 represents regression result of security companies. The result showed competition, size, Z-score and inflation positive significant on ROA, meanwhile GDP negative significant. For the second model Lerner Index, Z-score, GDP, inflation displayed significant and positive on Intermediaries measured by transaction value-to-asset. On the other hand, variable size showed negative significant on intermediaries.

TABLE 19 shows regression outcome of life insurance company, competition, size, and inflation variable had a positive significant impact on ROA. In contrary, GDP displayed negative significant on ROA. The result from second estimation showed competition, GDP and inflation presented presents positive significant. On the other hand, we presented the findings size and Z-score exert a negative and statistically significant effect on intermediaries.

The findings in TABLE 20 examined the impact of performance and intermediaries on competition. The higher competition is associated with the higher ROA. This result also aligned with impact of size and Z-score on ROA. However, GDP showed negative significant and Inflation positive insignificant. Second model presented competition positive significant impact on intermediaries and other independent variables turns out to be insignificant.

6. Conclusion

This paper focuses on the study of competition and its impact to profitability and intermediation in Indonesia's financial industries, such as banks, securities firms, and insurance companies due to liberalization of financial sector, showed by increasing number of foreign financial institutions operating in Indonesia. This study reveals that higher number of foreign financial institutions may induce the increase of competition in Indonesia financial industry. Moreover, foreign financial institutions also tend to have market power and can have influence efficiency in the market provided that they display higher level efficiency than domestic financial institutions. It also has a positive impact to profitability and intermediation, reflected by ROA and ratio of loans, transaction value and insurance premium income to total asset.

Empirically, these results are confirmed. The level of competition in banking, securities and insurance industry in Indonesia was analyzed due to the entering of cross border financial institutions, measured by Lerner index, Panzar-Rosse and Boone indicator. The link between level of competition and its impact to its profitability and intermediation were also analyzed. Using annual data of 102 conventional banks, 111 securities firms, 53 life insurances and 79 general insurances in Indonesia from 2013 to 2020 provided by Otoritas Jasa Keuangan (OJK), it showed that there were increasing number of foreign financial institutions in Indonesia financial sector and it impacted on increasing competition, showed by decreasing value of Lerner index and Boone indicator, and higher number of Panzar-Rosse H-statistic indicator. In addition, we use regression panel data fixed effect after conducting several tests including Breausch & Pagan LM Test and Hausman test, to examine the impact of competition to profitability an intermediation. It showed that increasing

competition had a significantly positive impact to firms' profitability and intermediation, the results of this study support research was conducted by Hope (2013) and Yuanita (2019). In the model, other variables such as z-score was also used to determine the stability and risk within each institution, size indicator, and also macroeconomic indicators, such as GDP and inflation that could affect financial institutions' performance and intermediation.

According to Lerner index of foreign and domestic financial institutions operating in Indonesia based on the data in the period of 2013 to 2020, it showed that foreign financial institution tended to have higher market power compared to domestic firms due to the efficiency in doing their business. So that there are needs of effort to boost efficiency of domestic financial firms, especially in terms of optimizing the adaption of technology and enhancing capacity of human resources in order to compete with more advanced foreign financial firms.

Appendix

TABLE 17
Estimation Result for Banks

	Dependent Variable	
	ROA	Intermediaries
Lerner	0.0178***	0.1062***
	-0.0032	0.0183
Size	-0.0114***	-0.0260***
	0.0032	0.0054
Zscore	0.0007***	-0.0003
	0.0001	0.0004
GDP	0.0527***	-0.1178**
	0.0128	0.0545
Inflation	-0.0207	-0.1545
	0.0375	0.2201
Constant	-1.5753***	5.6361**
	0.2596	1.9991
Observations	790	790
R-squared	0.012	0.119
Number of Bank	102	102

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

TABLE 18
Estimation Result for Security Companies

	Dependent Variable	
	ROA	Intermediaries
Lerner	0.0049***	1.7426**
	(0.0009)	(1.0071)
Size	0.0880***	-26.0871***
	(0.0057)	(4.4781)
Zscore	0.0171***	1.2434**
	(0.0008)	(0.7338)
GDP	-0.0701***	1.6773***
	(0.0044)	(25.9056)
Inflation	0.2945**	3.8891***
	(0.1009)	(1.0477)
Constant	0.1057 **	-5.443***
	(0.0312)	(9.376)
Observations	757	757
R-squared	0.2724	0.0054
Number of Security Companies	111	111

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

TABLE 19
Regression Result of Life Insurance

	Dependent Variable	
	ROA	Intermediaries
Lerner	0.0330***	0.0791***
	(0.0064)	(0.0208)
Size	0.0294***	-0.0362**
	(0.0070)	(0.0161)
Zscore	0.0411***	-0.0634***
	(0.0027)	(0.1715)
GDP	-0.0117**	0 .0230
	(0.0036)	(0.1715)
Inflation	-0.1107	0.8468
	(0.1612)	(0.6770)
Constant	-0.1139**	0.2243
	(0.0377)	(6.2686)
Observations	342	342
R-squared	0.4013	0.1062
Number of Companies	53	53

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

TABLE 20
Estimation Result for General (Non-Life) Insurance

	Dependent Variable	
	ROA	Intermediaries
Lerner	0.0335***	0.0589***
	(0.0027)	(0.0148)
Size	0.0286***	-0.0174
	(0.0054)	(0.0133)
Z-score	0.0097***	0.0015
	0.0007	(0.0028)
GDP	-0.0778***	0.0399
	(0.0219)	(0.1175)
Inflation	0.1384	0.0091
	(0.0848)	(0.4830)
Constant	2.4134***	-0.9645
	(0.7847)	(4.3126)
Observations	576	576
R-squared	0.3243	0.0302
Number of Companies	79	79

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