





# “The impact of financial and competition conglomeration policies on banking efficiency and risk in Indonesia”

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# THE IMPACT OF FINANCIAL AND COMPETITION CONGLOMERATION POLICIES ON BANKING EFFICIENCY AND RISK IN INDONESIA

**Abstract**

Financial conglomerates and bank competition play a significant role in developing efficiency levels and increased risk exposure. This study aims to formulate a conceptual model of the policy's impact of financial conglomerates and bank competition on bank efficiency and stability risk. This research is conducted using data samples from 90 commercial banks in Indonesia from 2010 to 2017. The empirical analysis is carried out using the dynamic data panel or Generalized Method of Moments (GMM). The study results show that policies of financial conglomerates and competition have a positive effect on banking efficiency. These results support previous empirical studies, where financial conglomeration, in general, can improve banking efficiency. Furthermore, it is found that the interaction between financial conglomerates and competition has a positive effect on banking stability. The implication of this research shows that the potential risks that cause distortion become irrelevant when the banking structure is more competitive. Furthermore, this study recommends the need to build the ideal financial conglomerate institutional structure to strengthen and encourage the role of more competitive banks.

**Keywords**

banking competition, financial conglomeration, banking risk, dynamic data panel method

**JEL Classification**

G21, G34, G32, C23

**INTRODUCTION**

The experience of the global financial crisis has opened the eyes of many to examine it. Analysts and regulators from various world financial institutions (World Bank, Asian Development Bank, International Monetary Fund, Islamic Development Bank) and financial business actors (both banking and non-banking) highlight financial conglomerates' critical role in maintaining financial system stability. Because of the crisis, the financial system's regulatory and supervision requirements could not maintain the financial conglomerate's activities fully. So, from the experience of the financial crisis that occurred in various parts of the world, it became increasingly aware of the importance of regulation and supervision to maintain financial system stability. Daiwa Institute of Research (2007) outlines the positive impact of financial conglomerates: financial conglomerates can increase competitiveness, increase the growth of economies of scale, improve efficiency with infrastructure development, delivery channels, diversification of superior products and easily accessible information. Vice versa, conglomeration also has a negative impact, as stated by MacDonald (1998), who says that there are several risks in a financial conglomerate: contagion effects,

group exposure, lack of transparency, quality management, rights of access to prudential information, and moral hazard. A financial risk conglomeration is needed in proper risk management with an integrated financial information system with such complex risks.

Saunders, Smith, and Ingo (2009) suggests that financial conglomerates have products and activities complex in financial services. Complex financial institutions are defined as intermediaries of financial transactions involved in several combinations of commercial banking, investment, asset management and insurance, whose failure can pose a systemic risk in the financial system as a whole.

Meanwhile, Venne t(2002), who analyzed the cost efficiencies and advantages of the financial conglomerate and the Universal bank in Europe said that conglomerations are more efficient than specialized banks, as well as their cost efficiency and profit levels will be greater. The results of this study indicate that the latest trend towards financial conglomerate can lead to a more efficient banking system. Vennet (2002) also conducted research on financial conglomerations in Italy as a *benchmark* for a group of European countries; where the process of deregulation and progressive liberalization caused by the application of Second banking Directive will produce major changes in the banking structure. Another conclusion, according to Vennet (2002), is that the banking group benefited from the consistent increase in efficiency and the presence of positive indications of the benefits of financial conglomerate.

Financial conglomeration has brought its challenges to financial service sectoral policies due to economies of scale and cross-sectoral finance. Based on this, OJK issued an integrated supervision policy for conglomerates using a risk-based approach and issued a policy No. 17/POJK.03/2014 (related to financial conglomerate) and POJK No. 18/POJK.03/2014 (concerning the application of integrated risk management for financial conglomerates). During the many studies on the influence of conglomerate policies and banking competition, there is still a new research space that has not been explored much about banking developments on efficiency and risk. Some gaps in previous studies are:

- 1) concerning conglomeration in the banking system: Bank conglomerate policy is a crucial issue because conglomeration affects not only bank efficiency but also potential risks that can threaten the whole financial system stability, and
- 2) concerning competition in the banking sector: Whereas previous research on banking competition only looked at the competition on banking efficiency (Andrieş & Căpraru, 2012), as well as the effect of competition on banking risk (De Nicolo, Jalal, & Boyd, 2006; Berger & Young, 1997; Soedarmono, Machrouh, & Tarazi, 2011).

Thus, there is still a new research gap to see how the simultaneously impact of the policies of financial conglomerates and banking competition, which so far has never been done in previous studies, particularly related to national banking in Indonesia.

## 1. LITERATURE REVIEW

The financial conglomerate is a business entity dealing with a wide range of markets with the characteristics of supply, demand, and profit, respectively (Verweire, 1999). The emergence of conglomeration in Indonesia is quite impressive, considering conglomeration is very dominant in the national economy. The conglomerate is referred to as a giant in the field of business because it has

an extensive and complex network. Ownership of financial services institutions (including banks, securities companies, financing companies, insurance, and reinsurance) incorporated into a conglomerate group emerged around 1997. According to Chronopoulos, Girardone, and Nankervis (2011), the financial sector that is increasingly integrated with trade, monetary, and other aspects of the international economy will increase interdependencies. On the other hand, proper man-

agement of the conglomerate will increase capital capacity, increasing national resilience in terms of economics.

### 1.1. Financial conglomeration

The financial conglomerate is defined differently in the USA, the European Union (EU), and Japan. Nevertheless, in international discussions, KK is a group that includes at least two major financial sectors of banking, securities, and insurance, with the main business being financial. There are several forms of integration or conglomeration models in the financial sphere. In addition to the purely financial conglomerate (integration model), there is also a universal banking model (Germany embraces this), a bank-parent with a model of a non-bank subsidiary (this is in the UK), as well as the financial model of the parent company (it is located in the United States) (OJK, 2017).

In the financial markets and capital markets, developments that have occurred over the past decade have shown how big businesses (banking, insurance, and securities) have progressively reorganized themselves and metamorphosis into what is common is referred to as a financial conglomerate or a group of financial institutions offering various services. KK itself usually refers to a strictly competing entity. According to Herring and Santomero (1990) in Verweire (1999), financial conglomerations differ in terms of where they have evolved into financial giants. The structural forms that this entity needs to achieve convergence will vary across jurisdictions and depend on regulations and oversight in host countries, taxation systems, the historical development of financial services industry, financial markets Competitive and the existence of economic scope (see also Verwiere 1999; Shirai 2001; Bank of Japan, 2005).

Three requirements must be met with financial groups in the European Union before they can be called financial conglomerations. Firstly, it must have at least one company engaged in the banking or securities sector and at least one company engaged in the field of insurance; Secondly, the group must be led by a bank, securities or insurance or a total ratio of the financial balance in the group with the total amount that has not been deposited to the banking, insurance, and securities,

not less than 40 percent. Thirdly, for each financial sector, the average total ratio of the balance to the total balance of the financial sector entity in the group and the solvency ratio of the financial sector with the solvency of financial entities in the group, must be at least 10 percent or total balance of the smallest financial sectors in the group at least EUR 6 billion (Daiwa Institute of Research, 2007) as it is known that the development of world banking is faster and firstly occurs in parts of the European Union (EU) countries. This is also evidenced by the readiness of these countries (EU) to integrate into the monetary sector by issuing a new currency unit, Euro. Therefore, studies on banking activities develop rapidly in these EU countries ahead of other countries.

### 1.2. The financial conglomerate structure

Generally, the form of a conglomerate financial structure in many countries follows the structure model, as stated earlier. In Asia, such as Japan, the financial conglomerate structure is categorized into four types:

- 1) financial holding company-group;
- 2) de-facto holding company-group;
- 3) financial institution parent-group; and
- 4) foreign holding company-group.

The model of financial conglomerate integration classified them into three main areas: banking, insurance, and securities. The integration of financial services refers to the production or distribution of financial services related to one of the three primary financial sectors. Some terms that connotation to financial integrations include bank assurance, universal banking, and financial conglomerate with the most integration models simple to the most elaborate (Skipper, 2000).

From previous studies regarding banking efficiency and competition, several studies, analyzing the evolution and convergence of banking efficiency in the context of financial integration in the European Union countries, have different results (see, among others, Lozano-Vivas & Pasiouras,

2010; Andrieş & Cocris, 2010; Weill, 2004; Vennet, 2000; Mamatzakis, Staikouras, & Koutsomanoli-Filippaki, 2008; Casu & Girardone, 2012). Mamatzakis, Staikouras, and Koutsomanoli-Filippaki (2008) tested the efficiency of costs and profits with the stochastic frontier analysis (SFA) approach in the banking system of 10 new EU member countries from 1998 to 2003. They found several convergence criteria in terms of cost-efficiency of new EU member countries, but no convergence was achieved in terms of profit efficiency.

Meanwhile, Casu and Girardone (2012) used the DEA method analysis to evaluate the EU 15 banks' cost-efficiency from 1997 to 2003. They applied the GMM panel model to assess the speed of the integrated banking market. They found evidence of convergence at the efficiency level compared to the average in the European Union, but there is no evidence of an increase in overall efficiency. Other studies analyze the evolution and convergence of banking efficiency in the context of financial integration in the European Union countries and have similar results (see, among others, Altunbas & Chakravarty, 1998; De Guevara & Maudos, 2002; Sheldon, 2001; Vennet, 2000; Weill, 2004; Evans, Hasan, & Lozano-Vivas, 2008; Ariss, 2010). Weill (2009) analyzed 10 European Union countries between 1994 and 2005, which informed that financial integration had been carried out in the banking market in recent years. Using the SFA approach to measure efficiency, Evans, Hasan, and Lozano-Vivas (2008) observed 14 banks' behavior from 1979 to 1997, which showed that the deregulation process in the European Union could be related to the convergence of efficiency in the banking industry.

Deregulation and opening of the banking market led to a convergence of efficiency in competitive markets. Furthermore, Ariss (2010) underlines that the current global conditions show symptoms where most developing countries have opened extensive financial liberalization to achieve higher economic growth levels. In conducting financial liberalization, the logic of policymakers is to increase competition between countries and deregulate their interest rate policies. Ariss (2010) cautioned that highly competitive pressures on the banking sector encourage financial institutions to enter markets in emerging countries and emerg-

ing market countries where their market competition is still relatively low or enter in financial markets where the benefits of efficiency generated are precious. In parallel with the expansion of activities carried out by banks and the identification of new opportunities to grow abroad, banks tend to gain market power. This is an essential concern among policymakers in the local or domestic sector, considering the emergence of moral hazard and excessive risk-taking that can be done by local/domestic due to increased market power by the foreign bank.

Partially, studies on banking competition and bank efficiency have also developed in line with the development of industrial organization theory. However, studies on banking competition and bank efficiency still show mixed results. Competition is one of the factors considered to affect bank efficiency. The integration of the banking sector in the EU, for example, is based on the belief that with the increasingly competitive banking industry in the EU due to the formation of a single market, the banking sector will be more efficient (Andrieş & Căpraru, 2012). However, two points of view have been debated regarding the direction of the competition relationship and bank efficiency.

## 2. DATA, METHODS AND HYPOTHESES

This paper uses secondary data, including indicators of financial ratios from the monthly financial statements of 90 banks, 30 categories of financial conglomerate banks for the 2010 to 2017—observation period obtained from reports to Bank Indonesia and OJK. Data are collected by observing the same individuals at consecutive time points during the observation period for secondary macroeconomic data collected from the World Development Indicators and the Financial Structure Database from the World Bank and several other sources.

Data analysis uses a dynamic panel data estimation model, a two-step GMM system. The GMM system considers the year dimension's dummy variable to control the fixed effects on the period dimension and the individual dimension. It con-



siders the constant variable in the regression equation. GMM systems are valid if the AR (2) and Hansen-J tests'  $p$ -value is lower than the level of significance (\*\* $p < 0.01$ ; \*\* $p < 0.05$ , and \* $p < 0.1$ ). Data panels are processed using the Stata MP-64 application. This research aims to prove empirically and to answer the following hypotheses in this study:

*H1: There is a positive and significant effect of a combination of financial conglomerates and bank competition on bank efficiency.*

*H2: There is a positive and significant effect of financial conglomerates and bank competition on banking risks.*

The empirical model to test Hypothesis 1 can be seen as follows. The dependent variable is banking efficiency, which is notated with  $EFF_1$  or  $EFF_2$ . The impact of joint relationships between bank conglomerates and banking competition (notated with  $COS \cdot HHI$  or  $CON \cdot HHI$ ) on bank efficiency is stated in equation (1) and equation (2) as follows:

$$\begin{aligned} EFF_{1,t} = & \alpha + \beta_1 EFF_{i,t-1} + \beta_2 SIZE_{i,t} + \\ & + \beta_3 EQTA_{i,t} + \beta_4 ROA_{i,t} + \beta_5 NPL_{i,t} + \\ & + \beta_6 NIM_{i,t} + \beta_7 LDR_{i,t} + \beta_8 COS_{i,t} + \\ & + \beta_9 HHI_{i,t} + \beta_{10} (COS \cdot HHI)_{i,t} + \\ & + \beta_{11} BIRR_t + \beta_{12} INF_t + \beta_{13} KURS_t + \\ & + \beta_{14} GDP_t + \varepsilon_{i,t}, \end{aligned} \quad (1)$$

$$\begin{aligned} EFF_{2,t} = & \alpha + \beta_1 EFF_{i,t-1} + \beta_2 SIZE_{i,t} + \\ & + \beta_3 EQTA_{i,t} + \beta_4 ROA_{i,t} + \beta_5 NPL_{i,t} + \\ & + \beta_6 NIM_{i,t} + \beta_7 LDR_{i,t} + \beta_8 CON_{i,t} + \\ & + \beta_9 HHI_{i,t} + \beta_{10} (CON \cdot HHI)_{i,t} + \\ & + \beta_{11} BIRR_t + \beta_{12} INF_t + \beta_{13} KURS_t + \\ & + \beta_{14} GDP_t + \varepsilon_{i,t}. \end{aligned} \quad (2)$$

An empirical model to test Hypothesis 2 can be seen as follows. The dependent variable is bank risk (notated with  $ZSCORE$  and  $LLP$ ). The impact of bank conglomeration and bank competition (notated with  $COS \cdot HHI$  or  $CON \cdot HHI$ ) on banking risk is stated in equation (3) and equation (4) as follows:

$$\begin{aligned} ZSCORE_{i,t} = & \alpha + \beta_1 ZSCORE_{i,t-1} + \\ & + \beta_2 SIZE_{i,t} + \beta_3 EQTA_{i,t} + \beta_4 ROA_{i,t} + \\ & + \beta_5 NPL_{i,t} + \beta_6 NIM_{i,t} + \beta_7 LDR_{i,t} + \\ & + \beta_8 COS_{i,t} + \beta_9 HHI_{i,t} + \\ & + \beta_{10} (COS \cdot HHI)_{i,t} + \beta_{11} BIRR_t + \\ & + \beta_{12} INF_t + \beta_{13} KURS_t + \beta_{14} GDP_t + \varepsilon_{i,t}, \end{aligned} \quad (3)$$

$$\begin{aligned} LLP_{i,t} = & \alpha + \beta_1 LLP_{i,t-1} + \beta_2 SIZE_{i,t} + \\ & + \beta_3 EQTA_{i,t} + \beta_4 ROA_{i,t} + \beta_5 NPL_{i,t} + \\ & + \beta_6 NIM_{i,t} + \beta_7 LDR_{i,t} + \beta_8 CON_{i,t} + \\ & + \beta_9 HHI_{i,t} + \beta_{10} (CON \cdot HHI)_{i,t} + \\ & + \beta_{11} BIRR_t + \beta_{12} INF_t + \beta_{13} KURS_t + \\ & + \beta_{14} GDP_t + \varepsilon_{i,t}, \end{aligned} \quad (4)$$

where study variables can be described as indicated in Table 1.

As mentioned in the previous section, this study aims to examine the impact of financial conglomeration and competition on banking efficiency and risk. Thus, in this study, there are two dependent variables, namely efficiency and banking risk. Before carrying out the empirical estimation, firstly, necessary to compute several research variables as a unit of analysis for testing the hypotheses in sequence with the following stages:

- 1) Stage 1: computing the efficiency level of each bank ( $EFF_1$  or  $EFF_2$ ) by using the DEA (Data Envelopment Analysis) method;
- 2) Stage 2: Herfindahl-Hirschman Index ( $HHI$ ) is calculated from the bank's third-party funds (deposits) to total banking assets;
- 3) Stage 3: conglomeration of total bank assets to total banking assets ( $COS$ ) and conglomerates of total bank conglomerates to all banks ( $CON$ ); and
- 4) Stage 4: estimation of empirical models using two-step dynamic panel data GMM estimators and orthogonal deviation transformations. As a comparison, empirical estimates also use the dynamic data panel, fixed effect model.

**Table 1.** Research variables

Variable	Description	Description
<b>Dependent variables</b>		
<i>EFF</i>	Bank efficiency	As <i>proxy</i> Bank profitability Proxy related to BANK efficiency (CRS and VRS) by maximizing output by using certain <i>inputs</i> . It means that the management have used the assets effectively.
<i>ZSCORE</i>	Insolvency Bank	As a <i>proxy</i> level of banking risk that measures the probability of bank insolvency. Insolvency occurs at the time of loss resulting from standard deviation return <i>on assets</i> increases and decreases the ratio of capital
<i>LLP</i>	Risk credit	Credit risk indicators. <i>LLP</i> is a loan <i>loss provisions</i> ratio of total credit
<b>Independent variables</b>		
<b>Variable explanatory</b>		
<i>Body</i>	The total ratio of conglomerate bank assets divided by the total assets of all banks	S- A- <i>proxy dummy</i> group of conglomerations based on total conglomerate bank assets ( <i>d</i> = 1) and non-conglomerate groups ( <i>d</i> = 0)
<i>CON</i>	The ratio of bank conglomerate divided by the number of all banks	Used as a <i>dummy proxy</i> Bank Group of Conglomerations based on the number of Banks ( <i>d</i> = 1) and non-conglomerate groups ( <i>d</i> = 0)
<i>HHI</i>	Herfindahl-Hirschman Index	Methods used to measure market Mastery Distribution (Market concentration) and Inference on Market Mastery
<b>Bank level control variable</b>		
<i>SIZE</i>	Log natural of total assets	Used as a proxy for the bank size associated with the total asset
<i>EQTA</i>	Total book value of shareholders equity over total asset	Higher equity values are used as bearings of future losses
<i>ROA</i>	Return on assets	As a <i>proxy</i> for bank returns. More efficient in operation and in the utilization of assets, then the ability of the bank will give greater returns. The hypothesis
<i>NPL</i>	Non-performing loans	It is used as <i>Proxy</i> quality Asset in loan portfolio and credit risk level. Increasing the ratio may signal decreased asset quality
<i>It</i>	Net interest margin	Measuring the bank's management capabilities manages its productive assets to generate net interest income
<i>LDR</i>	Loans to deposit ratio	Percentage of deposit funds tied to a credit portfolio. This ratio implies that banks rely on loans to finance loans
<b>State-level control variables</b>		
BIRR	Benchmark interest rate	Macroeconomic indicators. High interest rates, resulting in the ability of customers to pay declining credit
INF	Inflation	Macroeconomic indicators. High inflation results in the ability of paying low credit customers
Course	Exchange rate	The higher the exchange rate volatility, the higher the uncertainty
GDP	Economic growth	As an indicator of business cycles

### 3. RESULTS

Table 2 presents the descriptive statistics of variables used to estimate regression equation (1) through regression equation (4). Firstly, all the research variables need to be screening mechanism to allow for an outlier's data-free variable estimator. The outlier values in all variables, especially in the bank's performance, are interpolated between adjacent points due to the possibility that the value comes from missing values at a certain point of observation. Secondly, the variable economic growth rate (*GDP*) carried out the interpolation process between observation points to obtain monthly data (quarterly data is available).

Thirdly, the *EQTA* variable to calculate the risk of bank stability values more significant than one is also eliminated. *EQTA* is the total equity ratio divided by the total bank assets, where the maximum ratio is one. Fourthly, banks that do not convey, balance sheet reports, cash flow, and income statement reports or incomplete data are not used in this study. The research population observed 90 conventional banks from 115 banks are still in operation. Twenty-five banks are not used in observation because of data such as financial ratios, balance sheet, income statement report less complete. There are 30 conglomerate banks (consisting of 3 BUMN banks, 17 BUSN banks, and nine mixed/foreign banks).

**Table 2.** Variable description

Sources: Output of Stata.

Variable	Definition	Mean	Std. dev.	Min	Max	
Dependent variables						
$EFF_1$	Banking efficiency ( <i>CRS</i> )	89.598	9.764	36.706	100	
$EFF_2$	Banking efficiency ( <i>VRS</i> )	94.291	7.520	41.725	100	
<i>ZSCORE</i>	Bank risk	19.705	12.823	0.242	95.476	
<i>LLP</i>	Loan loss provisions (%)	1.961	1.797	0.000	13.784	
Independent variables						
<i>COS</i>	The ratio of total assets of conglomerate banks divided by total assets of all banks (%)	0.358	1.716	0.000	15.412	
<i>CON</i>	The ratio of the number of conglomerate banks divided by the number of all banks (%)	0.120	0.325	0.000	1.000	
<i>HHI</i>	Herfindahl-Hirschman Index	702.583	29.411	645.949	792.741	
<i>SIZE</i>	Natural log of total assets	9.491	1.662	5.312	13.891	
<i>EQTA</i>	The ratio of total capital divided by total assets (%)	15.869	10.253	3.796	97.571	
<i>ROA</i>	Return on assets (%)	2.590	1.640	0.000	20.450	
<i>NPL</i>	Non-performing loan (%)	2.532	1.960	0.000	15.050	
<i>NIM</i>	Net interest margin (%)	4.963	2.247	0.000	27.070	
<i>LDR</i>	Loan deposit ratio (%)	81.616	13.918	16.480	133.830	
<i>KURS</i>	Exchange rate (Rp/USD)	11.231	1.956	8.500	14.650	
<i>BIRR</i>	BI-rate (%)	6.359	1.002	4.250	7.750	
<i>INF</i>	Inflation (%)	5.236	1.604	2.790	8.790	
<i>GDP</i>	Economic growth (%)	5.544	0.605	4.660	6.520	
Conglomerate banks						
Bank	N	Buku-1	Buku-2	Buku-3	Buku-4	Amount
Government Bank (BUMN)	4	—	—	—	3	3
Commercial Bank (BUSN)	44	1	4	10	2	17
Local Bank (BPD)	25	—	—	—	—	—
Foreign Bank (Mixed)	17	1	3	6	—	10
Total	90	2	7	16	5	30

Table 2 shows that, on average, for the entire year of observation, it appears that the proportion of conglomerate of the size of the bank asset (*COS*) tends to be larger than the proportion of the bank's conglomerate (*CON*). In other words, bank conglomerate data in Indonesia shows that most of the financial conglomerate is through the asset size rather than the bank's number line. It means that it is necessary to test whether or not empirically a conglomerate through an asset ownership line will bring more benefits to banking than conglomerate through ownership of the asset.

Tables 2 and 3 show the estimation result of each bank's efficiency level ( $EFF_1$  or  $EFF_2$ ), which uses the DEA (Data Envelopment Analysis) method.

Based on the results of the empirical findings in Table 3 and in Table 4 shown how the bank's financial conglomerate seen from the side of the amount of assets owned by conglomerate Banks

(*COS*) and through the number of conglomerate Banks (*CON*) will affect the efficiency of banking. Improvements and efficiencies occur, if  $EFF_1$  is used as a dependent variable and the fixed effect method is applied, as Table 2. Further, it can also be observed that the positive relationship generated by *CON* against the bank's efficiency ( $EFF_1$  or  $EFF_2$ ) tends to be more stable or *robust* compared using *COS*. It can be concluded that the bank's financial conglomerate model tends to increase the level of banking efficiency. This positive relationship will be more noticeable if the ratio of the bank conglomerate to the number of Indonesian banking banks (*CON*) is used as an estimation variable to gauge how the bank's financial conglomerate impacts. Similarly, bank conglomerations based on asset ownership (*COS*) can have a positive and significant effect on the efficiency of the bank, both efficiencies with constant return scale ( $EFF_1$ ) as well as efficiency with a constant return variable ( $EFF_2$ ). This Positive relationship is robust against



**Table 3.** The effect of bank conglomeration and competition (*COS-HHI* or *CON-HHI*) on bank efficiency ( $EFF_1$ )

Sources: Data processed.

$EFF_1$	GMM system		Fixed effect model	
	$EFF_1$	$EFF_1$	$EFF_1$	$EFF_1$
$EFF_{1-L_1}$	0.5225*** (0.0162)	0.5137*** (0.0191)	0.6599*** (0.0075)	0.6573*** (0.0075)
SIZE	22.7916*** (1.5516)	23.6279*** (1.6048)	2.0367*** (0.2294)	2.1175*** (0.2298)
EQTA	1.0357*** (0.1353)	1.0912*** (0.1443)	0.0426*** (0.0124)	0.0414*** (0.0124)
ROA	0.9615*** (0.1849)	1.0070*** (0.1726)	0.8015*** (0.0580)	0.8075*** (0.0579)
NPL	-3.6133*** (0.3311)	-3.6260*** (0.3188)	-0.0941** (0.0395)	-0.0806** (0.0395)
NIM	2.0567*** (0.1997)	1.9841*** (0.1983)	0.0604 (0.0511)	0.0277 (0.0513)
LDR	0.2679*** (0.0369)	0.2657*** (0.0382)	0.1289*** (0.0062)	0.1295*** (0.0063)
COS	-8.5291*** (2.3735)	— —	0.8822 (0.6789)	— —
CON	— —	8.9626 (9.7169)	— —	7.9285** (3.6489)
HHI	-0.0111*** (0.0030)	-0.0077*** (0.0029)	0.0080*** (0.0026)	0.0094*** (0.0027)
COS-HHI	0.0156*** (0.0039)	— —	-0.0013 (0.0009)	— —
CON-HHI	— —	0.0228*** (0.0085)	— —	-0.0098* (0.0051)
BIRR	-1.0972*** (0.0814)	-1.0821*** (0.0836)	-1.1962*** (0.1446)	-1.2056*** (0.1447)
INF	0.0242 (0.0393)	0.0312 (0.0400)	-0.1132** (0.0546)	-0.1078** (0.0545)
KURS	0.0004*** (0.0001)	0.0003*** (0.0001)	0.0020*** (0.0001)	0.0020*** (0.0001)
GDP	0.5291 (0.3549)	0.4811 (0.3642)	2.1143*** (0.4197)	2.1634*** (0.4197)
Observations, <i>N</i>	8,550	8,550	8,550	8,550
Number of banks	90	90	90	90
R-squared	N/A	N/A	0.6192	0.6199
AR (2): <i>p</i> -value	0.346	0.436	N/A	N/A
Hansen-J: <i>p</i> -value	0.401	0.340	N/A	N/A

Note: \*\*\*  $p < 0.01$ ; \*\*  $p < 0.05$ .

estimation using System GMM. While on the fixed effect model, the efficiency in constant return scale ( $EFF_1$ ) as well as the efficiency with a *constant* return variable ( $EFF_2$ ) provide different results.

Tables 5 and 6 show the banking risk estimation result, which uses the DEA (Data Envelopment

Analysis) method. The dynamic data panel fixed effect model also uses as the comparison of empirical estimation. The impact of the financial conglomerate is re-used to see the influence of the financial conglomerate each through a line of asset ownership (*COS*) or a line of bank counts (*CON*). To see the banking risk, *ZSCORE* is used to assess

**Table 4.** The effect of bank conglomeration and competition (*COS-HHI* or *CON-HHI*) on bank efficiency ( $EFF_2$ )

Sources: Data processed.

$EFF_2$	GMM system		Fixed effect model	
	$EFF_2$	$EFF_2$	$EFF_2$	$EFF_2$
$EFF_2 \cdot L_1$	0.6035*** (0.0233)	0.5930*** (0.0243)	0.6842*** (0.0074)	0.6853*** (0.0074)
SIZE	14.0338*** (1.0853)	14.6775*** (0.9847)	1.9114*** (0.1930)	1.9397*** (0.1935)
EQTA	0.0289 (0.0876)	0.0918 (0.0955)	0.0090 (0.0104)	0.0077 (0.0104)
ROA	0.8305*** (0.1365)	0.8496*** (0.1460)	0.5043*** (0.0474)	0.5050*** (0.0474)
NPL	-2.8836*** (0.2056)	-2.7190*** (0.2027)	-0.1695*** (0.0331)	-0.1610*** (0.0331)
NIM	2.2898*** (0.1260)	2.1734*** (0.1384)	-0.0104 (0.0428)	-0.0264 (0.0431)
LDR	0.2186*** (0.0210)	0.2041*** (0.0229)	0.0777*** (0.0052)	0.0769*** (0.0052)
COS	-9.5230*** (1.7926)	— —	-0.5630 (0.5684)	— —
CON	— —	-3.8990 (7.8537)	— —	-0.3089 (3.0614)
HHI	-0.0162*** (0.0023)	-0.0133*** (0.0024)	0.0006 (0.0021)	0.0008 (0.0023)
COS-HHI	0.0160*** (0.0028)	— —	0.0006 (0.0008)	— —
CON-HHI	— —	0.0349*** (0.0078)	— —	0.0006 (0.0043)
BIRR	-0.6193*** (0.0671)	-0.5704*** (0.0646)	-0.5841*** (0.1211)	-0.5881*** (0.1214)
INF	0.0931*** (0.0286)	0.1052*** (0.0289)	-0.0464 (0.0457)	-0.0412 (0.0457)
KURS	0.0003*** (0.0001)	0.0003*** (0.0001)	0.0013*** (0.0001)	0.0013*** (0.0001)
GDP	0.1546 (0.2272)	0.3892* (0.2202)	0.4903 (0.3512)	0.5189 (0.3517)
Observations, <i>N</i>	8,550	8,550	8,550	8,550
Number of banks	90	90	90	90
<i>R</i> -squared	N/A	N/A	0.6400	0.6396
AR (2): <i>p</i> -value	0.207	0.156	N/A	N/A
Hansen-J: <i>p</i> -value	0.286	0.369	N/A	N/A

Note: \*\*\*  $p < 0.01$ ; \*\*  $p < 0.05$ .

the risk of bank insolvency as shown in Table 5, and *LLP* is used to measure credit risk as in Table 6.

Substantially, the results obtained in Table 5 and Table 6 indicate that the *CON* variables relate negatively and significantly to the risk. This suggests that financial conglomerations through the line of bank counts negatively im-

pact banking risk. On the contrary, the financial conglomerate based on *COS* asset ownership has no significant effect on the risk of *ZSCORE* insolvency. As for the financial conglomerate, both *COS* and *CON* have a negative impact on the credit risk of banking. This means the impact of financial conglomerate policies lowers the risk of banking credit.

**Table 5.** The effect of bank conglomeration and competition (*COS-HHI* or *CON-HHI*) on banking insolvency risk (*ZSCORE*)

Sources: Data processed.

ZSCORE	GMM system		Fixed effect model	
	ZSCORE	ZSCORE	ZSCORE	ZSCORE
<i>ZSCORE-L<sub>t-1</sub></i>	0.1146*** (0.0077)	0.1123*** (0.0086)	0.6403*** (0.0062)	0.6405*** (0.0062)
<i>SIZE</i>	-0.4502 (0.2812)	-0.5606** (0.2468)	-0.1272 (0.0874)	-0.1276 (0.0876)
<i>EQTA</i>	0.8083*** (0.0213)	0.8157*** (0.0216)	0.3332*** (0.0065)	0.3332*** (0.0065)
<i>ROA</i>	0.1231*** (0.0147)	0.1245*** (0.0150)	-0.0443** (0.0214)	-0.0448** (0.0214)
<i>NPL</i>	0.3412*** (0.0458)	0.3579*** (0.0414)	-0.0607*** (0.0153)	-0.0612*** (0.0153)
<i>NIM</i>	0.1102*** (0.0171)	0.1156*** (0.0181)	0.0054 (0.0198)	0.0056 (0.0199)
<i>LDR</i>	0.0385*** (0.0051)	0.0387*** (0.0046)	0.0120*** (0.0024)	0.0122*** (0.0024)
<i>COS</i>	-2.7301*** (0.8219)	— —	0.2239 (0.2627)	— —
<i>CON</i>	— —	-7.4191*** (1.4570)	— —	-0.0525 (1.4136)
<i>HHI</i>	-0.0030*** (0.0004)	-0.0029*** (0.0004)	0.0033*** (0.0010)	0.0030*** (0.0010)
<i>COS-HHI</i>	0.0037*** (0.0011)	— —	-0.0003 (0.0004)	— —
<i>CON-HHI</i>	— —	0.0101*** (0.0018)	— —	0.0002 (0.0020)
<i>BIRR</i>	0.1096*** (0.0105)	0.0958*** (0.0124)	0.1558*** (0.0560)	0.1578*** (0.0560)
<i>INF</i>	0.0064 (0.0040)	0.0164*** (0.0052)	-0.0199 (0.0211)	-0.0209 (0.0211)
<i>KURS</i>	-0.0000*** (0.0000)	-0.0000*** (0.0000)	0.0000 (0.0001)	0.0000 (0.0001)
<i>GDP</i>	0.1713*** (0.0355)	0.2016*** (0.0318)	0.5852*** (0.1623)	0.5774*** (0.1625)
Observations, <i>N</i>	8,550	8,550	8,550	8,550
Number of banks	90	90	90	90
<i>R</i> -squared	N/A	N/A	0.8470	0.8470
AR (2): <i>p</i> -value	0.030	0.031	N/A	N/A
Hansen-J: <i>p</i> -value	0.687	0.698	N/A	N/A

Note: \*\*\*  $p < 0.01$ ; \*\*  $p < 0.05$ .

**Table 6.** The effect of bank conglomeration and competition (*COS-HHI* or *CON-HHI*) on banking credit risk (*LLP*)

Sources: Data processed.

LLP	GMM system		Fixed effect model	
	LLP	LLP	LLP	LLP
<i>LLP-L<sub>1</sub></i>	0.4348*** (0.0173)	0.4494*** (0.0205)	0.8442*** (0.0050)	0.8441*** (0.0050)
<i>SIZE</i>	-0.5287*** (0.0650)	-0.5375*** (0.0719)	-0.0119 (0.0181)	-0.0098 (0.0181)
<i>EQTA</i>	0.0060 (0.0055)	0.0015 (0.0052)	-0.0030*** (0.0010)	-0.0029*** (0.0010)
<i>ROA</i>	-0.0329*** (0.0076)	-0.0275*** (0.0071)	-0.0127*** (0.0044)	-0.0131*** (0.0044)
<i>NPL</i>	0.4237*** (0.0174)	0.4280*** (0.0193)	0.1071*** (0.0042)	0.1072*** (0.0042)
<i>NIM</i>	0.0051 (0.0033)	0.0061* (0.0034)	0.0066 (0.0041)	0.0059 (0.0041)
<i>LDR</i>	0.0037** (0.0016)	0.0035** (0.0015)	0.0002 (0.0005)	0.0004 (0.0005)
<i>COS</i>	-0.9538*** (0.2215)	— —	-0.0457 (0.0542)	— —
<i>CON</i>	— —	-2.5247*** (0.5166)	— —	-0.7153** (0.2916)
<i>HHI</i>	-0.0010*** (0.0001)	-0.0010*** (0.0002)	-0.0004* (0.0002)	-0.0005** (0.0002)
<i>COS-HHI</i>	0.0013*** (0.0003)	— —	0.0001 (0.0001)	— —
<i>CON-HHI</i>	— —	0.0032*** (0.0006)	— —	0.0011*** (0.0004)
<i>BIRR</i>	0.0176*** (0.0048)	0.0182*** (0.0032)	0.0134 (0.0116)	0.0150 (0.0116)
<i>INF</i>	-0.0014 (0.0018)	0.0001 (0.0017)	0.0025 (0.0044)	0.0022 (0.0044)
<i>KURS</i>	0.0000*** (0.0000)	0.0000** (0.0000)	-0.0000*** (0.0000)	-0.0000*** (0.0000)
<i>GDP</i>	0.0233 (0.0161)	0.0248** (0.0116)	-0.0417 (0.0335)	-0.0465 (0.0335)
Observations, <i>N</i>	8,550	8,550	8,550	8,550
Number of banks	90	90	90	90
<i>R</i> -squared	N/A	N/A	0.8956	0.8957
AR (2): <i>p</i> -value	0.145	0.153	N/A	N/A
Hansen-J: <i>p</i> -value	0.197	0.249	N/A	N/A

Note: \*\*\*  $p < 0.01$ ; \*\*  $p < 0.05$ .

## 4. DISCUSSION

Empirical estimation shows that increasing financial conglomeration in the banking sector will have an impact on improving the efficiency. At the same time, it will positively affect banking stability. Thus, financial conglomerates in the banking sector play a decisive role in a country's economy because financial conglomerates in the banking sector not only increase banking efficiency but also have an impact on strengthening banking stability and reducing risk.

Furthermore, when observing the effect of bank competition on banking efficiency and risk simultaneously, the results of empirical estimates indicate that competitive banking will have a positive impact on bank efficiency and banking stability. Bank competition is considered a driving factor in the consolidation process carried out by banks. Interbank competition can influence bank performance, one of which has a positive impact through efficiency transmission. According to Schaeck and Čihák (2008), bank competition can stimulate banks to be more efficient. This argument is based on the *efficient structure hypothesis*, which states that the higher the market share, the more likely it is to create a price higher than the marginal cost. This high price is synonymous with inefficient conditions. Vice versa, low market concentration will create better efficiency. Thus, the role of banking competition is also significant for the economy in terms of strengthening the function of banks in improving performance (efficiency) and strengthening banking stability. On the other hand, a high level of economic development will be strongly influenced by the level of bank competition. This means that the use of the bank competition variable as a moderating variable to study how the impact of competition on banking efficiency has an identical meaning, where countries with high levels of economic development tend to be countries with higher levels of banking competition.

In this study, further analysis is to see whether the impact of financial conglomerates on banking efficiency and risk is also related to the impact of bank competition on bank efficiency and banking risk. Exciting results from empirical estimates can be obtained when the authors observe the combined impact of financial conglomeration and

competition on banking efficiency and stability. Specifically, this positive relationship can be extended to observe the differences in the influence of financial conglomerates in the banking market with a specific competition. It is concluded that the increased efficiency, along with the increase in bank financial conglomerates (either through asset ownership lines or the number of banks), occurs when the banking market is located at a higher level of competition. This empirical result is further concluded that the increase in financial conglomeration will be followed by increased banking efficiency. However, the positive impact will only occur when the banking market is also more competitive.

When the influence of banking financial conglomerates in the banking sector and the level of bank competition are considered, "as in this dissertation study," banking efficiency can be strengthened without weakening banking stability, if during the financial conglomerate and banking competition can be increased. In general, the results of the study indicate that *COS-HHI* and *CON-HHI* are significant interactive variables in improving banking efficiency and stability. That is, financial conglomeration in the banking sector will have a positive impact on bank efficiency and stability, if and only if the level of banking competition also increases. In addition to financial conglomerates, the level of banking competition plays a significant role in banking performance, which is manifested in banking efficiency and the risks it creates. Therefore, taking just one parameter between a financial conglomerate or banking competition can produce different conclusions. This is based on the fact that financial conglomeration and banking competition are complementary to encourage a more optimum level of efficiency. Other implications in the context of Indonesian banking, financial conglomeration will bring significant positive impacts. First, there are relationships between sub-sectors that can increase competitiveness. The existence of conglomeration can increase economies of scale and efficiency; financial service industry business activities can be more efficient with the development of infrastructure together with each business unit. The second is to strengthen distribution, promotion, and branding, which will ultimately strengthen the foundation of the financial services sector as a whole.



The institutional arrangement of the financial system is significant as an effort to strengthen the national financial services industry in the long run. For this reason, the resilience of banking institutions conducting financial conglomerates needs to be revisited and adjusted to the dynamics of developments that are occurring now and in the future. The lessons from the crisis that have occurred several times provide valuable lessons for us that quite a several banks do not have strong institutional fundamentals; they must be forced to close. The problem of banks at that time was because they did not have a strong capital structure; risk management was still low and weak in terms of implementing corporate governance. In the long run, banks that do not have substantial capital will find it difficult to compete with other banks, both local and foreign.

Considering the role of the banking industry conducting financial conglomerates that can support economic growth through the efficiency and institutional resilience of the financial system, it is deemed necessary to strengthen the structure of financial conglomerates. The structure of financial conglomeration in the future must be able to provide an immense contribution to the development of the national economy and be able to face external shocks both originating from the increasingly fierce business competition and withstand the impact of the global financial crisis currently affecting most developed countries. An ideal financial conglomerate structure is a conglomerate structure that has a healthy level of capital, has good governance, can manage risk well and meet the needs of the community for increasingly complex financial products and services.

There has been no firmness regarding the structure of financial conglomerates that are desired for the long term to maintain financial system stability. The applicable laws only regulate the types of subsidiaries that may be owned by banks. However, regarding the structure of the conglomerate and shareholders of the financial conglomerate, there is no firmness yet. In general, there are four types of corporate structures (based on directives) in several countries. However, in practice, not all are found, namely integrated model, parent-subsidiary model, holding company model, and horizontal group model.

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## CONCLUSION

The overall empirical results can be concluded as follows:

- 1) Financial conglomerates and competition have a significant effect on banking efficiency. The empirical results of the combined impact of financial conglomerate and competition (*COS-HHI* or *CON-HHI*) policies on the level of banking efficiency ( $EFF_1$  and  $EFF_2$ ) show that the interaction of financial conglomerates and banking competition simultaneously influence banking efficiency. These results provide support for previous empirical results in which conglomeration, in general, can improve banking efficiency;
- 2) Financial conglomerates and competition significantly influence the level of banking risk. Empirical estimation results prove that the interaction between financial conglomerates and bank competition (*COS-HHI* or *CON-HHI*) is a significant interactive variable to improve banking efficiency and stability.

Thus, in general, financial conglomerates in the banking sector play a decisive role in a country's economy because they not only increase efficiency but also have a positive impact on strengthening banking stability and reducing risk. The policy implication of this finding shows that financial conglomeration has a positive impact on banking efficiency and stability. This means that the potential and risk impact of financial conglomerates that because distortions are irrelevant when the banking structure is more competitive. However, in financial conglomeration, it is necessary to be aware of the risk of financial system disruption. Therefore, the role of authorities as supervisors of financial institutions is needed in conducting coordination mechanisms to meet the provisions of integrated supervision.

To strengthen the supervision of financial conglomerates, a clear legal framework is needed. It gives full authority to supervise financial conglomerates both for parent companies, subsidiaries, and affiliated companies. Ideally, there must be a special law governing financial conglomerates. Another implication of this research is that empirical estimation must be done with a more accurate methodology to capture the relationships between variables in determining the significance of the impact of the interaction of financial conglomerates and banking competition on banking efficiency and risk. However, as a consequence, several variables cannot be accommodated by researchers. These limitations will provide recommendations for further research, which aims to improve the results of previous research studies.

## AUTHOR CONTRIBUTIONS

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Writing – review & editing: Eleonora Sofilda, Muhammad Zilal Hamzah, Ari Muliarta Ginting.

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