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## Article

# Economic freedom on bank stability and risk-taking in emerging economy: Indonesian case study

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## BANKING & FINANCE | RESEARCH ARTICLE

# Economic freedom on bank stability and risk-taking in emerging economy: Indonesian case study

Felisitas Defung<sup>1\*</sup> and Rizky Yudaruddin<sup>1</sup>

**Abstract:** This paper examines the effect of economic freedoms on financial stability across banking industry in Indonesia. Using unbalanced panel data of Indonesian banks, the effect of economic freedom to financial stability is estimated using GMM approach covering the period of analysis from 2004 to 2018. The analysis is conducted by regression. The main model of economic freedom on financial stability is measured by ZSCORE and NPL, which include all sample banks in the first stage. This study also explores the effect base on different ownership type and size of the bank in the second and third stage, respectively. In addition, concentration ratio, bank size, efficiency, liquidity, and business diversification are included as control variables. The results indicate that economic freedom statistically has a positive and significant effect on financial stability as measured by ZSCORE. However, measurements with NPL showed dissimilar results. The findings have considerable implications for economic literature and policy practice.

**Subjects:** Economics; Banking; Financial Accounting

**Keywords:** economic freedom; financial stability; bank; economics; ZSCORE

## 1. Introduction

The issue of economic freedom has been a prominence topic in many countries, particularly developing countries like Indonesia. The interest on the issue is not merely related because it is a fundamental right of every individual but also related to its effect on various financial indicators including financial stability (Chortareas et al., 2013; Santoso et al., 2021). Bavetta (2004) defines economic freedom as an individual's choice to freely carry out economic actions. Economic freedom also means freedom of movement of labor, capital, and goods from various restrictions. Economic freedom in the context of a market economy refers to free competition and voluntary exchange (Gwartney & Lawson, 2002). Economic freedom underlies the growth and distribution of income (Berggren, 2003) and high economic growth (De Haan & Sturm, 2000).

Heritage foundation (2022) defines economic freedom as “the fundamental right of human in controlling its own labor and property in an economically free society where individuals are free to work, produce, consume, and invest in any way they please” also in which “governments allow labor, capital, and goods to move freely, and refrain from coercion or constraint of liberty beyond the extent necessary to protect and maintain liberty itself”. The impact of economic freedom in relation to various economics and financial variables have been interest of researchers. Previous studies have investigated the impact of economic freedom on GDP or economics growth (Doucouliagos & Ulubasoglu, 2006; Nasir & Hassan, 2011; Pambayun, 2021; Seyoum & Ramirez, 2019; Uzelac et al., 2020) on bank performance and bank profitability

(Asteriou et al., 2021; Sufian & Habibullah, 2010), on analysts' earnings forecast accuracy (T. C. T. Hou & Gao, 2021), and on renewable energy consumption on CO<sub>2</sub> emissions (Shahnazi & Shabani, 2021). Despite the extensive empirical study on the effect of economic freedom on various financial indicators, its impact on bank stability and risk taking has emerged in the literature in recent years (Ghosh, 2016; Harkati et al., 2020; Sarpong-Kumankoma et al., 2021). Although these studies focused on cross country data, the findings provide some insights.

The data shows that Indonesia's economic freedom, as indicated by the index of economic freedom, is progressing toward a decent level, particularly since 2017. The progress is contributed primarily from the property right score, where the overall score is currently above the average Asia-Pacific region (Figure 1) which place the country in rank 12<sup>th</sup> among 42 countries in the region.

Given the progression of Indonesia economic freedom, it prompts the question whether it affects financial stability, particularly in banking sector. Therefore, the purpose of this paper is to investigate the effect of economic freedom on bank stability and risk taking using individual bank data of single country data, Indonesia. To the best of our knowledge, this paper constitutes the first empirical evidence of the impact of economic freedom on bank stability on single country.

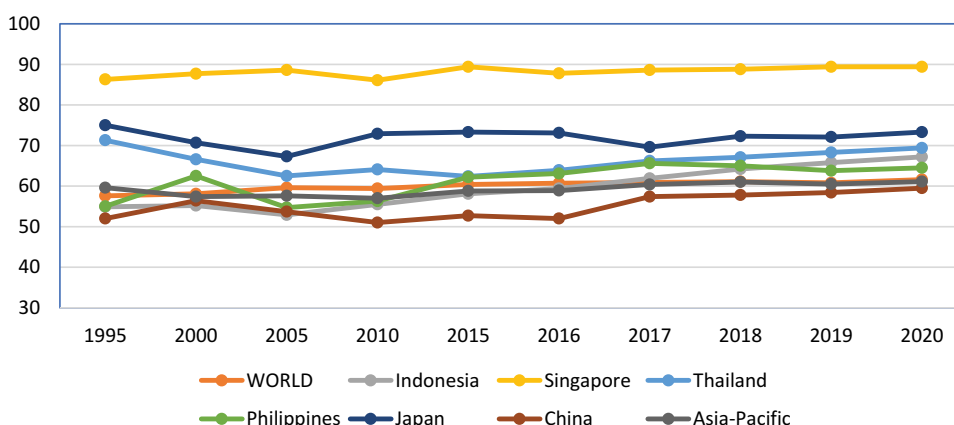
The rest of this paper is organized as follows. Next part, which is the second section, presents a review of the related literature. The third section details data on methodology employed in this paper. Empirical result and discussion are presented in the fourth section. Last section concludes the paper.

## 2. Related studies

There are rapidly growing studies on the effect of economic freedom on financial or banking stability. Studies on the impact of economic freedom on economy has been widely investigated. On the general scale, scholars such as Carlsson and Lundström (2002), Karabegovic et al. (2003), and De Haan et al. (2009) focused the research on the economic freedom and its link with economic growth. The studies mostly conclude that there is a strong relationship between economic freedom on economic growth. Furthermore, research by King and Levine (1993) and Beck et al. (2013) find the importance of economic growth on banking stability. Empirical studies show that a stable macroeconomics policy is more favorable for well-functioning financial system.

Financial stability is defined as the ability of a financial system to absorb the shocks the system has to face. A number of studies investigated bank stability in relation to various variables. Two groups appear in literature, first group is cross country study and second group is on single country. Research of bank stability can be classified into two groups, cross-country and single-

**Figure 1.** Economic freedom index of Indonesia and the rest of the World source: compiled from heritage foundation index ([www.heritage.org/index/](http://www.heritage.org/index/)).



country studies. The cross-country research includes study by Asteriou et al. (2021) who investigate the impact of corruption, economic freedom, regulation and transparency on bank profitability and bank stability in Eurozone area. The study concludes that greater economic freedom improves profitability and banking stability. This finding is in line with the finding of Chiaramonte et al. (2021). Some notable cross-country studies include Ghosh (2016) using MENA banks, Li (2019) using transition countries data and Sarpong-Kumankoma et al. (2021) and Shittu (2019) in Sub-Saharan countries.

Meanwhile, research on bank stability using single country data provide varied evidence. Adusei (2015) studies the impact of bank size and funding risk on bank stability in Ghana. The study finds that both variables affect bank stability positively. Similar result is also reported by Chand et al. (2021) and Ologbenla (2021) in their study on bank stability in Fiji and Nigeria. On the contrary, Ali and Puah (2019), Le (2020), and Nguyen and Du (2022) find that bank stability affects bank profitability positively. Moreover, Le (2020) also report that loan growth has a negative effect on bank stability in Vietnamese bank. An identical result is reported by Pham et al. (2021) in Vietnam. With regard to ownership, research by Park & Oh (2020) in US bank find common ownership has a strong relation in bank stability.

Mixed evidence in the literature on the effect of economic freedom and internal bank variables on bank stability possibly stems from different level of data, various proxies of stability, and diverse country. This study aims to fill the void in the literature regarding the effect of economic freedom on bank stability in developing country.

### 3. Data and methodology

To investigate the effect of economic freedom on financial stability, we employ annual data of individual bank's financial statement, balance sheet, and income statement, from across 124 banks over the period of 2004–2018. The data was extracted from Indonesian Banking Directory supplied by The Indonesian Financial Service Authority. Following Ghosh (2016), Asteriou et al. (2021), and Pham et al. (2021), we gathered economic freedom data from Heritage Foundation, which is commonly used in economics and business researches. The Heritage Foundation index, which is economic freedom index, encompasses several aspects, namely, rule of law, government size, regulatory efficiency and open market business. Using several indicators in each dimension, the five dimensions are weighted together to form a composite index, where 0 indicates the lowest and 10 the highest economic freedom.

To estimate the relationship between economic freedom and bank stability, we employ generalized method of moments (GMM) estimator introduced by Arellano and Bond (1991). The regression equation is set up as follows:

$$BS_{it} = \beta_0 + \beta_1 EF + \beta_2 CV + \varepsilon_{it} \quad (1)$$

where BS, EF, and DV are bank stability, economic freedom, and controlled variables, respectively. The indices  $i$  stand for bank and  $t$  represents time.

Following existing literature such as Mavrakana and Psillaki (2019) and X. Hou and Wang (2016), we employ three measures to proxy financial stability, namely ZScore, non-performing loan (NPL), and loan loss provision to total loan (LLPL), reflecting bank insolvency. Following Lepetit and Strobel (2013), we construct ZScore using

$$ZEQTA_{i,t} = \frac{MROA_i + EQTA_{i,t}}{SDROA_i}$$

A higher ZScore indicates higher stability and lower possibility financial distress, which is considered to be more appropriate to measure stability than the common leverage ratio. The ZScore defines as portfolio risk, which is given as profits divided by SD(RoA; Barry et al., 2011; Le,

2020). Non-performing loans (NPL) indicates credit risk and is the ratio of loans loss provisions divided by total loans. According to the European Central Bank (European Central Bank/ECB, 2017), it is a credit risk measure that directly affects the profitability of banks and, hence, financial stability. A high percentage of this proxy means that there is an increase on credit portfolio, which could spillover and affect the stability of the financial system (European Central Bank/ECB, 2017).

This research employs several controlled variables gathered from bank-specific factors. These variables include concentration ratio, bank size, efficiency, liquidity, and business diversification. The concentration ratio is represented from five firm in banking sector (CR5), whilst bank size (SIZE) is measured by the natural log of total assets. The ratio of the total cost to the total income (CTI) of the bank is used as the measure of bank efficiency, whereas the ratio of deposit to total assets (DEPO) and the ratio of loan to total assets (LTA) represent bank liquidity, and finally the ratio of non-interest income to total assets (NON) proxies business diversification of the bank.

Furthermore, Equation (1) is further expanded as follows:

$$BS_{it} = \beta_0 + \beta_1 VAR\ L1 + \beta_2 EF + \beta_3 EF\ L1 + \beta_4 CR5_{it} + \beta_5 Size_{it} + \beta_6 CTI_{it} + \beta_7 DEPO_{it} + \beta_8 LTA_{it} + \beta_9 NON_{it} + \varepsilon_{it} \quad (2)$$

The system GMM approach (Blundell & Bond, 1998) allows us to control for persistence and endogeneity issues and therefore yields consistent estimates.

The analysis is conducted by running the regression in three stages. We regress the main equation of economic freedom on financial stability measured by ZEQTA and NPL, which include all sample banks in the first stage. In the second stage, we break the sample into two different ownership type, government and private, by using similar set of variables used in the main regression. Accordingly, in third stage, we repeat the use of same set same variables on two different bank size, large and small bank.

#### 4. Empirical result

Table 1 summarizes the definition of variables and also provide descriptive statistic of all variables used in this research.

To check for possible multicollinearity among variables, we run Pearson pair-wise sample as presented in Table 2. It can be seen from the table that there is no serious issue of multicollinearity among the regressors since the maximum sample correlation is 0.38 or less than 0.5 (Gujarati, 2003).

To address the question whether the economic freedom has an impact on financial stability, Equation (1) was used to estimate the included variables discussed in Section 2. Table 3 present the result of main model which considers ZScore (ZEQTA) and NPL as dependent variables in column 1–2 and 3–4, respectively. The result indicates that the effect of the economic freedom (EF) on financial stability measured by ZScore is positive and statistically significant at 1% level of confidence. This result confirms the finding of Mavrakana and Psillaki (2019) and Asteriou et al. (2021) but runs contrary with Ovi et al. (2014). The effect of prior economic freedom ( $EF_{L-1}$ ) on bank stability apparently does not have much difference than the same year condition. This implies the bank stability effect of time different. However, similar relationship does not exist if measured by NPL. The estimation result presents a negative and statistically significant coefficient of economic freedom on non-performing loan. This finding demonstrates that more flexible business and economics operational resulted in lower non-performing loan, which contradicts the finding of Ovi et al. (2014).

**Table 1. Descriptive statistics**

<b>Variables</b>	<b>Measure</b>	<b>Obs</b>	<b>Mean</b>	<b>Std. Dev</b>	<b>Min.</b>	<b>Max</b>
<b>Dependent Variables</b>						
ZSCORE	ZSCORE = (MROA + EQTA)/SDROA; MROA represents the average value of the return on assets; EQTA is the ratio of total equity to total assets, SDROA is the standard deviation of the return-to-assets ratio	1626	19.0857	14.1737	-3.6931	149.205
NPL	Bank non-performing loans to gross loans	1543	3.0085	3.4336	0.02	51
LLPL	LLPL is Loan Loss Provision to Total Loan	1593	0.0248	0.0289	3.84e-06	0.4755
<b>Independent Variables</b>						
EF	Index of Economic Freedom employed, which is measured on a scale from 0 to 100	1626	56.1102	3.5055	51.9	64.2
<b>Control Variables</b>						
CR5	5-firm concentration ratio in the banking sector	1626	49.8919	1.9131	47.1319	55.0725
SIZE	Natural logarithm of total assets	1626	15.6966	1.8653	9.8752	20.9336
CTI	Ratio of total cost to total income	1626	0.8229	0.2913	0.2574	5.4568
DEPO	The ratio of total banks' third-party funds to total assets	1626	0.7016	0.1707	0.0393	0.9615
LTA	The ratio of loans to total assets	1620	0.5939	0.1517	0.0054	0.9310
NON	The ratio of non-interest income to total assets	1626	0.0199	0.0509	0.0001	0.9779

**Table 2. Correlation Matrix**

Variables	ZEQTA	NPL	LLPL	EF	CR5	SIZE	CTI	DEPO	LTA	NON
ZEQTA	1.0000									
NPL	-0.2189	1.0000								
LLPL	-0.1633	0.7729	1.0000							
EF	0.1286	-0.1191	-0.1590	1.0000						
CR5	-0.0213	0.1729	0.2404	-0.1720	1.0000					
SIZE	0.0243	-0.0180	0.0477	0.3855	-0.1727	1.0000				
CTI	-0.0868	0.1463	0.0254	0.1297	-0.0069	-0.1030	1.0000			
DEPO	-0.0233	-0.0301	-0.1331	-0.1718	0.0475	-0.0385	0.1093	1.0000		
LTA	0.0249	-0.0948	-0.2256	0.2494	-0.1883	0.0900	0.0199	0.0172	1.0000	
NON	-0.1404	0.0461	0.0971	0.1532	-0.0225	0.2556	-0.0001	-0.2442	-0.0853	1.0000



**Table 3. The impact of economic freedom on bank stability-main regression**

Expl. variables	Dependent variables			
	ZEQTA	(2)	(3)	NPL
	(1)			(4)
VAR L1.	0.7320*** (0.0647)	0.7332*** (0.0641)	0.5668*** (0.0280)	0.5681*** (0.0280)
EF	0.1421** (0.0667)		-0.0598** (0.0252)	
EF L1.		0.1598** (0.0783)		-0.0608* (0.0309)
CR5	-0.1152 (0.1188)	-0.0904 (0.1137)	0.2019*** (0.0409)	0.1884*** (0.0389)
SIZE	-0.1923 (0.2428)	-0.1967 (0.2393)	0.0467 (0.0518)	0.0401 (0.0523)
CTI	-1.5425** (0.6376)	-1.5441* (0.6476)	1.5445** (0.7475)	1.5269** (0.7511)
DEPO	-2.8335 (2.2855)	-2.9252 (2.2801)	0.0035 (0.5512)	0.0405** (0.5472)
LTA	-0.7007 (1.6488)	-0.6445 (1.6472)	1.0913 (0.8039)	1.0409 (0.8033)
NON	-8.1889** (4.1013)	-8.2158** (4.0101)	-0.5506 (1.4724)	-0.5564 (1.4703)
Constanta	9.8644 (8.1119)	7.8531 (7.9009)	-8.1137*** (1.7113)	-7.3243*** (1.5898)
Observations	1496	1496	1400	1400
Number of banks	124	124	123	123
AR(2) test	0.304	0.285	0.107	0.121
Hansen-J test	0.232	0.245	0.263	0.262

Sources and notes: Authors' calculation. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10%, respectively. Standard errors of each coefficient are in parentheses.

As far as control variable is concerned, concentration ratio (CR5) appears to be only powerful in relation to the effect on non-performing loan. The variable has a strong positive influence at 1% statistical confidence, which signifies that concentrated environment tends to increase the ratio of NPL. There is no strong evidence that bank size is associated with bank stability for both measures. This can be seen from the insignificance of the coefficient, which strongly support the idea of Ovi et al. (2014) and Le (2021) in term of negative magnitude

Although the magnitude of the coefficients is inconsistent, among all controlled variables, only bank efficiency (CTI) is, consistently, statistically significant under both dependent variables as well as both models. With regard to bank efficiency effect, the variable has a negative influence on ZScore while positive sign emerges in relation to the NPL. These mean that lower ratio of efficiency, measured as total cost to total income, is a better condition for bank stability and vice versa. On the contrary, higher inefficiency increase the NPL. The positive and significant effect also is apparent on concentration ratio to the NPL, which indicate that the more concentrated the bank, the higher the non-performing loan. Surprisingly, business diversification negatively affects bank stability, which indicates that the more income generated from non-traditional banking activities, the lower bank stability.

Further regression based on ownership type (Table 4). The result demonstrates that economic freedom mostly affects private banks significantly. This is presumably due to the fact that private banks run their operation merely on a competitive basis, without privilege on capital provision. Economic freedom tends to be more important for private bank business efficiency, therefore an efficient bank consequently a stable bank (Defung et al., 2016, 2017).

**Table 4. The impact of economic freedom on bank stability—government vs private**

Expl. variables	Government		Private	
	ZEQTA	NPL	ZEQTA	NPL
	(5)	(6)	(7)	(8)
VAR L1.	0.4136*** (0.0895)	0.7180*** (0.0589)	0.7363*** (0.0673)	0.4555*** (0.0626)
EF	0.0886 (0.1687)	−0.0820 (0.0499)	0.1731** (0.0784)	−0.0470* (0.0254)
CR5	0.0514* (0.1160)	0.1276* (0.0729)	−0.1430 (0.1615)	0.2551*** (0.0415)
SIZE	0.4731 (0.4748)	0.1119 (0.1138)	−0.3212 (0.3200)	0.0048 (0.0639)
CTI	−1.9086 (1.7808)	0.9715 (2.6705)	−1.7278* (0.9409)	1.3726** (0.6299)
DEPO	−5.9030 (5.2442)	0.5638 (1.5495)	−2.0657 (2.5078)	−0.1802 (0.6975)
LTA	8.0369** (3.2661)	2.3360 (2.1346)	−2.6564 (2.1466)	1.1896* (0.6532)
NON	−71.9033 (59.5402)	−43.8933 (46.3665)	−8.3343** (3.6375)	0.6436 (1.8665)
Constanta	−3.3950 (10.1531)	−4.9311 (4.2432)	12.2632 (10.808)	−10.324*** (1.9991)
Observations	414	410	1082	990
Number of banks	31	31	95	94
AR(2) test	0.073	0.578	0.368	0.340
Hansen-J test	0.079	0.179	0.850	0.922

Sources and notes: Authors' calculation. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10%, respectively. Standard errors of each coefficient are in parentheses.

**Table 5. The impact of economic freedom on bank stability—small vs large**

Expl. variables	Small		Large	
	ZEQTA	NPL	ZEQTA	NPL
	(9)	(10)	(11)	(12)
VAR L1.	0.5431*** (0.0770)	0.4654*** (0.0589)	0.7989*** (0.0901)	0.5555*** (0.0374)
EF	0.4359*** (0.1168)	0.0042 (0.0394)	0.1213 (0.0889)	−0.0592** (0.0267)
CR5	−0.0936 (0.2138)	0.1802*** (0.0398)	−0.0733 (0.1569)	0.1376*** (0.0487)
SIZE	−1.4337*** (0.4029)	−0.0943 (0.1295)	−0.2172 (0.3789)	0.0583 (0.0523)
CTI	−2.6553** (1.1999)	0.8542 (1.4283)	−1.1370 (1.1125)	1.1376* (0.6583)
DEPO	−6.9773** (3.3577)	0.1545 (1.2185)	1.2715 (2.1243)	−0.4000 (0.5965)
LTA	−0.8003 (2.2482)	0.1448 (0.8112)	1.1591 (2.2529)	−0.0594 (0.8575)
NON	−16.5470 (10.3115)	18.2150 (17.7369)	−4.0653 (5.2080)	−2.6274 (1.6235)
Constanta	18.0156 (13.6856)	−7.5968** (3.0733)	4.1048 (10.8058)	−3.7057* (1.8825)
Observations	764	709	732	691
Number of banks	99	96	89	86
AR(2) test	0.308	0.514	0.241	0.347
Hansen-J test	0.971	0.407	0.906	0.961

Sources and notes: Authors' calculation. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10%, respectively. Standard errors of each coefficient are in parentheses.

Moreover, the result based on bank size's classification reveals that economic freedom tends to be more important positively for small banks if measured by ZScore ratio, whilst a negative association to NPL is evident for large bank. Both results are statistically significant at 1% and 5%, respectively. We can narrow the analysis following the result obtained from previous part, which suggests that economic freedom is only superior for private banks. It is notable that small banks in Indonesian are mostly owned by private sector, then this result sharpens the argument that a more liberalized economics and business operation in the country is more favorable for small banks. The result also shows that large the bank, the economic freedom is negatively connected to financial stability measured by NPL.

The result implies that the improvement of economic freedom in the country tends to reduce the ratio of bad loan. The possible explanation is that the freedom of conducting business leads to a better environment to conduct business operation, which in turn improve the ability of debtor to repay their loan.

The result on controlled variables lead to similar figure with earlier part. Bank size, bank liquidity, (DEPO) and bank efficiency (CTI) are shown to have a negative linkage to bank stability. In specific, the power of linkage tends to be more meaningful under small bank sample (Table 5). Meanwhile, concentration ratio, consistently, appears to affect NPL positively.

**Table 6. The impact of economic freedom on bank stability—control for global financial crisis**

Expl. variables	Dependent variables			
	ZEQTA		NPL	
	(13)	(14)	(15)	(16)
VAR L1.	0.7306*** (0.0658)	0.7331*** (0.0651)	0.5660*** (0.0288)	0.5696*** (0.0286)
EF	0.2120** (0.0840)		−0.0610** (0.0237)	
EF L1.		0.2141** (0.0898)		−0.0562** (0.0287)
CR5	−0.2812* (0.1419)	−0.2131* (0.1237)	0.1978*** (0.0542)	0.1733** (0.0520)
SIZE	−0.2133 (0.2503)	−0.2117 (0.2422)	0.0523 (0.0524)	0.0413 (0.0516)
CTI	−1.5140** (0.6671)	−1.5082** (0.6530)	1.5530** (0.7457)	1.5289 (0.7481)
DEPO	−2.5713 (2.2699)	−2.7227 (2.3008)	−0.0732 (0.5499)	−0.0079 (0.5458)
LTA	−1.1658 (1.7496)	−0.9579 (1.7117)	1.0718 (0.7689)	0.9909 (0.7659)
NON	−8.2712** (4.1132)	−8.1817** (3.9847)	−0.5874 (1.4713)	−0.6274 (1.4651)
CRISIS	1.4046*** (0.5303)	1.1312** (4.4698)	0.0383 (0.2934)	0.1302 (0.2848)
Constanta	14.3615 (8.7470)	10.9922 (8.0804)	−7.8807*** (2.1142)	−6.8131*** (2.0350)
Observations	1496	1496	1400	1400
Number of banks	124	124	123	123
AR(2) test	0.304	0.279	0.105	0.110
Hansen-J test	0.223	0.238	0.266	0.266

Sources and notes: Authors' calculation. The global financial crisis is a dummy variable equal to 1 for financial crisis period (2008–2009) and 0 otherwise. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10%, respectively. Standard errors of each coefficient are in parentheses.

Lastly, empirical testing is to examine robustness tests. To ensure the result is robust, we also conduct several additional tests to check whether the result is stable. First, we re-estimate the main model and introduce crisis variable, and the result is shown to be unchanged (Table 6).

Second, we employ alternative method that is commonly used in the empirical research on bank stability, fixed effect, and random effect (Adusei, 2015; Ali & Puah, 2019; Asteriou et al., 2021; Chiamonte et al., 2021). The result is presented in Table 7. Third, instead of using ZScore as dependent variable, we construct the model using loan loss provision to total loan (LLPL) as dependent variable (Table 8). Using these procedures, the effect of economic freedom on financial stability remains unchanged, which means the result is robust.

## 5. Conclusion

By using unbalanced panel data of Indonesian banks, this study empirically investigates the effect of economic freedom on bank stability. Empirical research around the globe tend to focus on the cross-country studies with few on single country. The result concludes that there is strong evidence that bank stability, measured by ZScore, is positively related to economic freedom.

**Table 7. The impact of economic freedom on bank stability—fixed effect and random effect**

Expl. variables	Dependent variables			
	ZEQTA		NPL	
	FE	RE	FE	RE
	(17)	(18)	(19)	(20)
VAR L1.	0.4705*** (0.0207)	0.8594 *** (0.0127)	0.4157*** (0.0235)	0.5389*** (0.0198)
EF	0.4271*** (0.0772)	0.0794 (0.0535)	−0.0174 (0.0368)	−0.0654*** (0.0219)
CR5	−0.2182** (0.1089)	−0.1664 (0.1196)	0.2296*** (0.0521)	0.2118*** (0.0496)
SIZE	−0.7783*** (0.3357)	−0.1222 (0.1112)	−0.3244* (0.1723)	0.0637 (0.0482)
CTI	−0.6013** (0.6407)	−0.2229* (0.6479)	1.3454*** (0.2945)	1.5607*** (0.2679)
DEPO	−0.1917*** (0.5342)	−0.177** (0.1003)	−0.0233 (0.7537)	0.0140 (0.5021)
LTA	−0.1384 (0.4283)	−0.6060 (0.2285)	1.4279** (0.7186)	1.1027* (0.5694)
NON	−0.7057 (0.4786)	−0.2029 (0.3653)	−4.3631* (2.5623)	−0.8678 (2.1307)
Constanta	0.778*** (0.4425)	0.6162* (0.3299)	−5.4681* (3.2348)	−8.5041*** (2.6356)
Observations	1496	1496	1400	1400
Number of banks	124	124	123	123
Prob > F	0.0000	0.0000	0.0000	0.0000
R <sup>2</sup> <sub>within</sub>	0.4599	0.3935	0.2588	0.2518
R <sup>2</sup> <sub>between</sub>	0.6933	0.9741	0.4842	0.6899
R <sup>2</sup> <sub>overall</sub>	0.5783	0.8140	0.3869	0.4650

Sources and notes: Authors' calculation. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10%, respectively. Standard errors of each coefficient are in parentheses.

However, an opposite result exists when measured by NPL. The results are robust when the model is tested using fixed and random effect.

In the midst of intention in many developing countries to improve competitiveness of their banking sectors, one has to be ensured of the stability of financial sector. It becomes more crucial, as banking sector serves as the back-bone of the economy in most developing countries, including Indonesia. In general, the empirical result strongly indicates that a more liberalized business operation environment is favorable in ensuring the stability of banking sector.

The outcomes of this study have considerable implication for literature and policy practice. First, authorities should maintain or even improve the policy in ensuring some degree of freedom for banking operation as well as reduction in regulatory burden in banking sector without neglecting prudential element. In that environment, it is expected to enable bank management to navigate its resources allocation more efficiently. Second, pointing to empirical results for private and small banks where it appears that economic freedom is strongly related to bank stability. This shows that openness and simplification in business operations as well as reducing bureaucratic barriers have a significant impact on the efficiency and stability of particularly for private banks and small banks. Given the number of private and small bank in Indonesia is relatively large, then the proper policy in maintaining and improving degree of freedom become more critical in enhancing bank stability.

**Table 8. The impact of economic freedom on bank stability—loan loss provision to loan**

Expl. variables	Dependent variables: LLPL			
	(21)	(22)	(23)	(24)
VAR L1.	0.4629*** (0.0857)	0.4610*** (0.0873)	0.4636*** (0.0900)	0.4630*** (0.0909)
EF	−0.0007*** (0.0002)		−0.0007*** (0.0003)	
EF L1.		−0.0008* (0.0783)		−0.0008*** (0.0004)
CR5	−0.0020*** (0.0004)	0.0019*** (0.0004)	0.0019*** (0.0006)	0.0017*** (0.0005)
SIZE	0.0018*** (0.0004)	0.0018*** (0.0004)	0.0018*** (0.0004)	0.0018*** (0.0004)
CTI	0.0132* (0.0069)	0.0131* (0.0069)	0.0132** (0.0069)	0.0131** (0.0069)
DEPO	0.0073 (0.0056)	−0.0074 (0.0056)	−0.0074*** (0.0058)	−0.0073*** (0.0058)
LTA	−0.0034 (0.0083)	−0.0036 (0.0081)	−0.0036*** (0.0076)	−0.0039*** (0.0076)
NON	−0.0015 (0.0172)	−0.0011 (0.0175)	−0.0018*** (0.0174)	−0.0017*** (0.0178)
CRISIS			0.0006*** (0.0027)	0.0014*** (0.0026)
Constanta	−0.0811*** (0.01727)	−0.0679*** (7.0147)	−0.0782* (0.0194)	−0.0634* (0.0147)
Observations	1466	1466	1466	1466
Number of banks	124	124	124	124
AR(2) test	0.687	0.675	0.689	0.678
Hansen-J test	0.834	0.308	0.298	0.321

Sources and notes: Authors' calculation. LLPL is Loan Loss Provision to Total Loan \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10%, respectively. Standard errors of each coefficient are in parentheses.

Despite of the contribution of this study, we would like to highlight some of its limitations. This study is based on data of single country. It would be worth if the research data is extended across South East Asian countries to compare the effect of economic freedom on bank stability. Furthermore, some importance variables could be included, such as inward FDI (foreign investment) and technological effect.

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