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Capital Buffer for Stronger Bank Stability: Empirical Evidence from Indonesia's Commercial Banks

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ABSTRACT

This study investigates the relationships between capital buffer and bank stability among commercial banks in Indonesia during the period 2001 to 2015. The scope of this study is before and after the 2007-2008 financial crisis and the implementation of Basel II and Basel III in Indonesia's banking sector. By using dynamic panel regression, the estimation indicates that improvement of the capital buffer will enhance bank stability. Furthermore, bank market power, revenue diversification, and size have a positive impact on boosting bank stability. Hence, this study offers insights into the role of capital buffer in supporting bank stability.

Keywords: Bank capital buffer, bank capital, bank stability

INTRODUCTION

Indonesia's economy and banking sector took a battering during the 1997 Asian crisis. After struggling to recover from the meltdown, again in 2007, Indonesia was not spared when the subprime mortgage crisis hit the United States which affected the global economy. However, Indonesia's economy was relatively strong during the 2007-2008 crisis, despite the general slowdown in the global economy (Bank Indonesia, 2008).

Bank capital plays an important role in promoting bank stability and hence, it is strictly regulated and supervised. However, there are arguments whether bank capital supports bank stability. According to the moral hazard theory, capital reduces agency costs due to conflict of interest between stockholders and creditors (Jensen & Meckling, 1976). A highly capitalised bank will reduce the incentive of moral hazard and tend to adopt good management practices

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because the shareholders are actively involved in controlling and monitoring the management of costs and capital allocation (Fiordelisi, Marques-Ibanez, & Molyneux, 2011). Moreover, capital absorbs the loss potential during a crisis (Van den Heuvel, 2002). However, signalling perspectives suggest that large amounts of capital indicate that a bank holds risky assets (Berger, Herring, & Szego, 1995). Another side of the moral hazard view states that capital can be counterproductive, since it drives excessive risk-taking (Berger & Bouwman, 2013). As the capital increases to fulfil the requirement, it leads bank managers to adjust the bank's asset risk (Van Hoose, 2007). Therefore, even though the regulator enacts capital regulations for good purposes, such regulations have an unforeseen favourable effect.

Some empirical studies show that capital regulations can either have a positive significant impact or no impact at all on bank stability. Chalermchatvichien, Jumreornvong and Jiraporn (2014) found that an increase in capital decreases the bank's risk-taking behaviour. However, Barth, Caprio and Levine (2004), and Demirguc-Kunt and Detragiache (2011) did not find a significant impact of capital regulations on bank stability.

A capital buffer is usually defined as excess capital above the minimum requirements (Garcia-Suaza, Gómes-Gonzáles, Pabón, & Tenjo-Galarza, 2012; Shim, 2013). Under the capital buffer theory, banks tend to hold a capital buffer to maintain the capital level above the minimum requirements, because they face explicit and implicit costs when their capital is below the requirements (Jokipii & Milne, 2011). The authors suggested that explicit costs relate to penalties and/or restrictions imposed by regulations are triggered by regulatory breaches, while the implicit costs may be due to regulatory interference designed to control excess demands for insurance. Jokipii and Milne (2011) examined the relationship between bank capital buffer and risk adjustment and found that changes in capital buffer affect the risk of high and low capitalised banks differently.

Many previous studies have focused on the impact of capital regulations on bank stability (Barth et al., 2004; Chalermchatvichien et al. 2014; Demirguc-Kunt & Detragiache, 2011). However, as noted previously, holding a capital buffer has explicit and implicit costs (Jokipii & Milne, 2011). The literature related to capital buffers examines their procyclical and countercyclical characteristics (Shim, 2013). To the best of our knowledge, there is a dearth of research on the impact of capital buffers on stability. Therefore, this study aims to fill the gap in the literature by examining the relationship between capital buffers and bank stability, rather than assessing the relationship between capital regulation and bank stability.

A capital buffer refers to excess capital over the requirement. This study examines the impact of capital buffers on bank stability, specifically, the incremental effect of buffer on enhances bank stability. The

focus is on Indonesia's banking sector for the following reasons. First, Indonesia is a bank-based country. Considering the domination of the banking sector in Indonesia's financial system, bank stability is an important factor for financial stability. Second, Indonesia's banking sector is concentrated. After financial deregulation in 1988, the number of banks in Indonesia increased significantly, but the competition was concentrated. In 2014, that competition structure was still concentrated. Out of the nation's 119 commercial banks, 62% of the banks' total assets were held by the 10 largest banks. A bail-out by the government to banks that experienced failure shows the phenomenon of "too big to fail". Third, besides the "too big to fail" phenomenon, Brown and Dinç (2011) illustrated the phenomenon of "too many to fail" in some emerging markets, including Indonesia. Lastly, Indonesia has adopted the Basel I, II, and III principles as the international standards for its banking regulations.

This study contributes to providing insight about the role of additional capital buffers in strengthening bank stability The result of this study will provide an indication about the implementation of Basel III, which is still on-going. Capital buffers will be a crucial issue since bank bail-in is considered to be included in Indonesia's Banking Law. Moreover, as we include bank specific variables, our findings will emphasise the importance of strengthening individual banks to support bank stability. As argued by Vallascas and Keasey (2012), even though the macroprudential perspective, which focuses on the whole financial system, is important, a micro-prudential approach is still the main concern of regulations.

The dynamic panel regression with a two-step system GMM approach was used to analyse the sample consisting of 70 commercial banks. The empirical result indicates that the incremental capital buffer has a positive impact on changes in bank stability. As such, increases in capital buffer will enhance bank stability.

The remainder of this paper is organised as follows. Section 2 is a brief review of the impact of Basel in Indonesia's banking sector. Section 3 describes the research methodology, which includes the empirical model and description of the variables. Section 4 discusses the regression results while Section 5 concludes the paper.

The Implementation of Basel in Indonesia's Banking Sector

Basel I was published by the Basel Committee on Banking Supervision (BCBS) in 1988, and Indonesia's banking sector adopted Basel 1 in 1993. Under Basel I, banks are recommended to maintain a minimum capital ratio of 8%. Indonesia's Central Bank, through Bank Indonesia Regulation ("Peraturan Bank Indonesia" or "PBI") PBI No. 3/21/PBI/2001, has an 8% minimum capital requirement for risk-weighted assets. Furthermore, in 2004, the BCBS issued a new capital framework, known as Basel II, which was further refined in 2006 (Bank Indonesia, 2012). Indonesia's banking sector adopted Basel II in 2007. The objective of Basel II is to ensure the stability financial

system through three pillars: minimum capital requirements, a supervisory review process, and market discipline (Bank Indonesia, 2006). Indonesia's Central Bank adopted Basel II through several regulations in relation to the components of the three pillars. Regarding the capital regulation, one of the regulations issued by Indonesia's Central Bank was PBI No. 10/15/PBI/2008, which regulates more detailed components of the Tier I, Tier II, and Tier III capital. As a response to the 2007-2008 financial crisis, the BCBS renewed the guidance of capital regulations for the banking sector under Basel III. Basel III was published by the BCBS in 2010 (Bank Indonesia, 2012).

Basel III suggests standards about capital, liquidity, and leverage to strengthen regulations, supervision, and risk management in the banking sector. The capital standards require banks to hold a larger amount of capital than the requirement under Basel II. Basel III aims to achieve a minimum capital requirement of 8% by January of 2019 (Vallascas & Keasey, 2012) and other stricter capital requirements.

Indonesia's banking sector implemented Basel III gradually from January 2013, and Basel III is expected to be fully implemented in January 2019 (Bank Indonesia, 2012). Regarding the capital regulation, Indonesia's Central Bank issued a PBI that requires banks to gradually hold a capital conservation buffer, countercyclical buffer, and/or capital surcharge. Based on this regulation, since January 1, 2016, all banks were required to hold a countercyclical buffer ranging from 0% to 2.5% of the bank's risk-weighted assets. The capital buffer is expected to promote bank stability. However, to fulfil the requirements of the capital buffer, there is a possibility that a bank's excessive risk-taking behaviour will eventually affect its stability.

METHODS

Sample and Data

This study analysed data obtained from Indonesian commercial banks data. Data from sharia banks, rural banks, and local development banks were excluded, since they have different regulations and market structures from commercial banks. The banks included in the sample have a minimum of 14 years of financial statement, complete ratio components, and a positive total equity and profit before tax. The total sample consists of 70 banks, which covers 1,003 observations from 2001 to 2015. Data used for calculating bank specific variables were obtained from annual financial statements published by Indonesia's Central Bank and the Financial Services Authority of Indonesia.

Empirical Model

As stated previously, this study uses a dynamic panel regression with a two-step system GMM, introduced by Arellano and Bover (1995), and Blundell and Bond (1998), to examine the impact of bank capital buffers on bank stability. The system estimator serves a more flexible variance-covariance structure under the moment

conditions, and the GMM approach is better than the traditional OLS in assessing financial variable movements (Lee & Hsieh, 2013). The following equation is used:

$$\begin{aligned}\Delta STAB_{i,t} = {} & \alpha_0 + \beta_1 \Delta STAB_{i,t-1} + \beta_2 \Delta BUFF_{i,t} \\ & + \beta_3 MKTPWR_{i,t} + \beta_4 REVDIV_{i,t} \\ & + \beta_5 SIZE_{i,t} + \beta_6 SOB_{i,t} + \beta_7 FOB_{i,t} \\ & + \beta_8 ROA_{i,t} + \beta_9 DUMMYCRISIS_t \\ & + \beta_{10} DUMMYCAPREG1_t \\ & + \beta_{11} DUMMYCAPREG2_t \beta_{12} GDPGR_t \\ & + \varepsilon_{i,t}\end{aligned} \quad (1)$$

Description of Variables

Bank stability (STAB) is the dependent variable, and Z-score as the measure. Following Lepetit and Strobel (2013), the Z-score is computed as the return on assets (ROA) plus the capital-adequacy ratio divided by the standard deviation of assets return, which is calculated over the full sample. The Z-score measures distance from insolvency, and it increases as profitability and solvency increase, and decreases as the standard deviation of return increases. A higher Z-score indicates a lower probability of insolvency, which is a direct measurement of the bank's stability (Kasman & Carvallo, 2014).

Capital buffer (BUFF) is the independent variable. It is measured as the difference between the ratio of total capital to the risk-weighted assets and the minimum capital ratio requirement. This study uses 8% as the capital requirement for 2001 to 2014, based on PBI No. 3/21/PBI/2001, dated 13 December 2001, and PBI No. 9/13/PBI/2007, dated 1 November 2007. Furthermore, in 2012, Bank Indonesia renewed the capital requirement through PBI No. 14/18/PBI/2012, dated 28 November 2012. This requirement obliged banks to hold a certain ratio as a minimum amount of capital based on the bank's risk profile. Capital requirement data based on a bank's risk profile only became available in 2015; it is still not available for all banks. Considering these limitations, this study uses the 8% capital requirement for period 2012 to 2014 and for banks whose 2015 data of risk-based capital ratio are not available.

Several control variables are incorporated which covered bank market power (MKTPWR); bank specific variables, namely bank revenue diversification (REVDIV), size (SIZE), profitability (ROA); bank ownership (FOB and SOB); dummy of crisis; dummy of capital regulations; and a macroeconomic variable.

Following Iveta (2012), this study uses the Lerner Index to measure bank market power. It also measures the inefficiency that comes from the difference between the price and the marginal cost. The Lerner index is written as follows:

$$Lerner_{i.t} = \frac{(P_{i,t-} MC_{i.t})}{P_{i,t}} \quad (3)$$

where price (P) is the price of the total assets of bank i at time t, proxied by the total revenue (interest and non-interest income) divided by the total assets. Marginal cost (MC) is derived from the following translog cost function, following the study conducted by Iveta (2012):

$$lnTC_{i,t} = \beta_0 + \beta_1 lnQ_{it} + \frac{1}{2}\beta_2 lnQ_{i,t}^2 + \sum_{k=1}^{3} \gamma_{kt} W_{k,it} + \sum_{k=1}^{3} \emptyset_k \, lnQ_{i,t} lnW_{k,it} + \frac{1}{2}\sum_{k=1}^{3}\sum_{j=1}^{3} \ln W_{k,it} \, lnW_{j,it} + \varepsilon_{it} \quad (4)$$

where TC_{it} is the total operating cost, Q_{it} represents the bank's output or total assets of bank i at time t. $W_{k,it}$ is the three input prices, which are the input price of labour (ratio of personnel expenses to total assets), the price of funds (interest expenses to total deposits), and the price of fixed capital (other operating and administration expenses to fixed assets), respectively. The marginal cost is calculated as follows:

$$MC_{i.t} = \frac{TC_{it}}{Q_{it}} \left[\beta_1 + \beta_2 lnQ_{it} + \sum_{k=1}^{3} \emptyset_k lnW_{k,it} \right] \quad (5)$$

The adjusted Herfindahl Hirschman Index (HHI) is also used following Elsas, Hackethal and Holzhäuser (2010), as a proxy of revenue diversification. It is measured as:

$$REVDIV_{i,t} = \left[1 - \left[\left(\frac{INT^2}{REV} \right) + \left(\frac{COM^2}{REV} \right) + \left(\frac{TRAD^2}{REV} \right) + \left(\frac{OTHER^2}{REV} \right) \right] \times 100 \right] \quad (6)$$

where INT represents the interest revenue; COM, TRAD, and OTHER represent the revenue from commissions, trading activities, and other revenues respectively and REV is the total revenue.

Based on Pessarossi and Weill (2015), size is computed by the natural logarithm of the bank's total assets. Dummy variables were used for SOB (State-Owned Bank) and the FOB (Foreign-Owned Bank) to represent government-owned and foreign-owned banks respectively. Dummy variable SOB will be 1 if the bank is state-owned bank; it is 0 for other banks. Dummy variable FOB will be 1 for a foreign and joint venture bank and 0 for other banks. Furthermore, profitability is proxied by ROA, which are computed as the net income divided by the total assets.

The dummy variable crisis is used to accommodate the effects of the 2007-2008 financial crisis. The dummy variable crisis will be 1 for the years of 2007 and 2008, and 0 for all other years. To accommodate the effect of changes in regulations during the research period, this study included two dummy variables of capital regulation. The first dummy variable, Dummy Capreg1, represents PBI No. 10/15/PBI/2008, which regulates stricter components of bank capital. This regulation was officially enacted on January 1, 2009, and therefore, the dummy variable of Capreg1 will be 1 for 2009 to 2011, and 0 otherwise. The second dummy variable, Dummy Capreg2, represents PBI No. 14/18/PBI/2012, which regulates the risk-based capital ratio. This regulation was officially enacted on November 28, 2012; hence, the dummy variable of Capreg2 will be 1 for 2012 through to 2015 and 0 otherwise.

The GDP growth (GDPGR) is employed to capture the effect of the business cycle

and use the lag of GDP growth in the regression model, considering that the effect of the business cycle occurs in later years.

RESULTS AND DISCUSSION

Table 1 is the descriptive statistics of the variables examined in the empirical model. The dependent variable ΔZ-score (Z-score of bank i in year t minus year t-1) has a mean value of -0.2749. The mean of ΔBuffer is -0.0029. The Lerner Index, the proxy of bank market power, has an average value of 0.2900. The mean value of revenue diversification is 0.2861. Bank profitability is measured by the ratio of the ROA. The average value of the ROA is 0.0193.

Table 1
Descriptive statistics

Variable	Obs	Mean	S.D.	Min	Max
Z-score	1003	37.849	34.029	0.693	264.847
ΔZ-score	913	(0.275)	20.650	(147.462)	233.121
Buffer	1003	0.173	0.201	(0.00005)	2.213
Δ Buffer	913	(0.003)	0.162	(2.122)	2.113
MktPwr	1003	0.290	0.122	(0.329)	0.744
RevDiv	1003	0.286	0.151	0.008	0.704
Total assets (in million Rupiah)	1003	35,747,973	91,322,736	58,012	845,998,379
Size	1003	15.470	2.068	10.968	20.556
ROA	1003	0.019	0.042	(0.008)	0.854
SOB	1003	0.059	0.236	0.0	1.0
FOB	1003	0.359	0.480	0.0	1.0
DummyCrisis	1003	0.137	0.344	0.0	1.0
DummyCapreg1	1003	1.349	1.243	0.0	1.0
DummyCapreg2	1003	0.267	0.443	0.0	1.0
GDP growth	1003	0.051	0.007	0.035	0.060

Table 2 presents the correlation matrix between the variables in this study. In the correlation matrix, the dependent variable ΔZ-score is expected to be positively correlated with ΔBuffer.

The two-step system GMM regression results are presented in Table 3. There is the possibility of an endogeneity problem between bank stability and capital buffer. The endogeneity might occur due to the reverse causality, where bank stability influences to the levels of its capital buffers. Moreover, there might be endogeneity due to the reverse causality between bank stability and bank market power, as well as bank stability and bank revenue diversification. This study address this potential problem by using the lag of endogenous variables as instruments and utilising several instrumental variables. Besides using the dummy variable of SOB, the dummy variable of FOB, the dummy variable of crisis, and the lag of

Table 2
Correlation matrix

	ΔZ-Score	l.ΔZ-Score	ΔBuffer	MktPwr	RevDiv	Size	ROA	SOB	FOB	Dummy CapReg1	DummyCapReg2	Dummy Crisis	l.GDP Growth
ΔZ-Score	1												
l.ΔZ-Score	-0.140	1											
ΔBuffer	0.781	-0.183	1										
MktPwr	0.003	0.077	0.002	1									
RevDiv	-0.008	0.007	-0.011	0.292	1								
Size	-0.007	0.033	0.002	0.390	0.506	1							
ROA	0.017	0.026	0.005	0.191	0.059	0.107	1						
SOB	0.002	0.020	0.002	0.122	0.039	0.433	-0.006	1					
FOB	0.005	0.011	0.008	0.288	0.591	0.325	0.069	-0.198	1				
DummyCapReg1	-0.028	-0.055	-0.020	-0.051	0.013	0.038	0.146	-0.001	0.335	1			
DummyCapReg2	0.010	0.008	0.001	0.101	0.245	0.267	-0.101	-0.001	0.067	-0.377	1		
DummyCrisis	0.064	0.117	0.039	-0.049	-0.071	-0.046	-0.048	0.002	0.008	-0.238	-0.290	1	
l. GDP Growth	0.069	-0.039	0.088	-0.095	0.112	0.131	-0.069	-0.003	0.069	0.141	0.192	0.263	1

GDP growth, the dummy variable of listed banks, changes in inflation, and changes in exchange rate as instrumental variables were also employed. Sargan and Hansen's test results indicate that the instruments as a group are exogenous. The Arellano-Bond tests for AR (1) and AR (2) also meet the requirement for no autocorrelation.

Table 3
Regression results

Regression results	Coeff	Prob
Dependent variable: ΔZ-score		
l.ΔZ-Score	0.033*	0.000
ΔBuffer	104.972*	0.000
MktPwr	3.868*	0.000
RevDiv	10.726*	0.000
Size	0.605*	0.000
ROA	-7.108	0.332
SOB	-4.088*	0.000
FOB	-2.541*	0.000
DummyCapreg1	0.080	0.652
DummyCapreg2	-0.458*	0.007
DummyCrisis	2.019*	0.000
l. GDP Growth	-76.791*	0.000
Sargan test		$\chi2$ (89) = 106.44
p-value		(0.1000)
Hansen test		$\chi2$ (89) = 62.47
p-value		(0.9850)
Arellano-Bond test for AR (1)		N(0,1) = -2.22
p-value		(0.0030)
Arellano-Bond test for AR (2)		N(0,1) = 2.03
p-value		(0.0420)

* Significant at 1%

The regression results indicate that ΔBuffer has a positive significant effect on ΔZ-Score, which means that a higher increment in the capital buffer improves bank stability. This finding supports the perspective of moral hazard theory, in that, a higher capitalised bank will reduce the incentive of moral hazard. It also supports the argument which states that capital absorbs losses in the event of a crisis (Van den Heuvel, 2002). This finding is in line with other studies from developed and emerging countries. For instance, Duran and Lozano-Vivas (2014) found that risk-shifting behaviour weakens banks that hold a larger capital buffer in the European Union. In addition, Chalermchatvichien et al. (2014) found that higher capital will lower bank risk-taking in Asia. However, the results were in contrast to those of Barth et al. (2004), and Demirguc-Kunt and Detragiache (2011), who found that compliance to Basel, in the form of stricter capital, does not have a correlation with bank stability.

The estimation results for the control variables show a positive significant impact of bank market power on changes in bank stability, which indicates that a higher bank market power will improve bank stability. This finding is consistent with the results of Berger, Klapper and Ariss (2009), who use a sample of banks from developed countries. It is also consistent with the findings in Ariss (2010), who focused on developing countries using a traditional "competition fragility" view, which states that banks with a higher degree of market power have less exposure to risk, indicating stronger stability. Studies that support the competition fragility view argue that banks with higher market power are capable

of reducing information asymmetry and building sustainable relationships (Petersen & Rajan, 1995). They are also able to screen and distinguish between good and bad prospective debtors (Cetorelli & Peretto, 2000). This advantage will enhance the credit quality, and thus, support bank stability.

For the control variables related to bank specific characteristics, revenue diversification significantly and positively affects changes in bank stability. This result is in line with the finding of Shim (2013), who showed evidence of the benefits of diversification to bank stability in US bank holding companies. This finding is possible, considering that revenue diversification appears to provide effective hedges against the risk (Shim, 2013), and hence, more diversified revenue will enhance bank stability. This result is also consistent with that of Nguyen, Skully and Perera (2012), who study emerging countries in South Asia. They found that revenue diversification and market power jointly affect bank stability, where banks with high market power become more stable when they diversify their income.

Moreover, this study observed that bank size has a positive impact on changes in bank stability. This result is consistent with that of Berger et al. (2009). It is likely is that larger banks have better monitoring technologies and hedging techniques to immunise their portfolios (Berger et al., 2009). Bank profitability seems to have a positive but insignificant impact on bank stability. However, this result is not consistent with that of Duttagupta and Cashin (2011), who showed that bank profitability supported bank stability.

In terms of ownership, the coefficient of the dummy variable of SOB shows a negative and significant sign. The result suggests that SOBs tend to have a lower incremental effect on bank stability. This finding indicate that government ownership may be associated with bank fragility and is possibly due to the "too big to fail" argument, which leads to excessive risk-taking behaviour. Moreover, the dummy variable of FOB also exhibits a negative and significant sign. The result indicates that foreign banks are also associated with lower incremental in bank stability. This finding was supported by Berger et al. (2009), who found a negative relationship between foreign ownership and bank stability. This result might be explained by the nature of foreign banks, which must comply with regulations, both in their home and host countries, which leads to more volatile earnings.

Two capital regulations in the regression model were incorporated through the dummy variable of Capreg1 and the dummy variable of Capreg2. The regression result shows the coefficient of dummy Capreg1 to be positive and insignificant and of dummy Capreg2 to be negative and significant. The possible explanation might be that capital regulation does not have an immediate strengthening effect on bank stability. In 2013, average Z-Score and average Buffer, as well as average ΔZ-Score, and average ΔBuffer exhibited higher figures than those

in 2012. However, in 2014, bank stability and capital buffer, both on average and average incremental, were shown to be relatively weaker than those in 2013. Then, in 2015, the Z-score and capital buffer increased and became higher than those in 2014. These yearly different conditions might imply that banks need time to adjust their capital to comply with the regulations, and the impact of capital buffer on bank stability also takes time.

The coefficient of the dummy variable of the crisis shows a positive and significant sign. The result indicates that the crisis condition is associated with stronger bank stability. Meanwhile, the lag of GDP growth has a significant negative impact on changes in bank stability. This result is in line with that of Saadaoui (2014), whose study of 50 emerging countries across the world shows the negative effect of GDP growth on changes in bank stability is possibly due to the existence of capital adjustment costs, cognitive biases, or risk measurement biases.

For the robustness check, the study employs changes in the ratio of non-performing loan to total loan (NPL) as a measure of bank stability and use the change in NPL (ΔNPL) as the dependent variable replacing ΔZ-Score. The result is consistent with the finding using ΔZ-Score. ΔBuffer has a negative significant effect on ΔNPL, which indicates that the additional capital buffer leads to reduced changes in non-performing loans, which means enhanced bank stability. Moreover, we also run the dynamic panel regression using the GMM difference panel estimator. The result is consistent with that obtained using the system panel model estimator when we use ΔZ-Score as the dependent variable. The result indicates that ΔBuffer has a positive and significant impact on ΔZ-Score. However, when we replace the dependent variable with ΔNPL, the result exhibits a negative but insignificant effect.

CONCLUSION

This study has examined the effect of capital buffers on bank stability. After employing a two-step system GMM estimator in a dynamic panel regression, the overall regression results imply the important role of the capital buffer to promote bank stability. Furthermore, the degree of concentration in the banking sector also becomes an important burden, as higher bank market power will enhance bank stability. For bank-specific variables, bank revenue diversification and bank size have a positive impact on changes in bank stability, whereas SOBs and FOBs have a negative impact on changes in bank stability. The negative impact of a dummy variable for capital regulation on changes in bank stability implies that banks might take time to adjust to capital regulation. Lastly, the regression results reveal that bank stability is affected by a financial crisis and a business cycle. Therefore, this study provides signals regarding the importance of capital buffers in improving bank stability.

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