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The Cyclical Behavior of Capital Buffer of Indonesian Islamic and Conventional Banks

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Abstract

This paper is aimed at analyzing the cyclical behavior of capital buffer of Islamic and conventional banks in Indonesia. More specifically, this paper has three objectives. First, to test whether capital buffer in Indonesian banking industry as a whole is countercyclical or procyclical. Second, to test whether there is a difference in the level of capital buffer of Islamic banks as compared to the level of capital buffer of conventional banks. Third, to test whether there is a difference in the cyclicality of capital buffer of Islamic and conventional banks. The analysis in this paper is conducted using the standard dynamic system generalized method of moments (system GMM) regressions and includes a panel of 108 banks over the period between 2004 and 2019. From the results, it can be concluded that the capital buffer of Islamic and conventional banks in Indonesia is procyclical. From the results, it can also be concluded that no difference exists in the level of capital buffer of Islamic banks as compared to conventional banks and in the cyclicality of capital buffer in Islamic and conventional banking. If the countercyclical capital buffer is achieved, a policy measure to alter the cyclical behavior of capital buffer of Islamic and conventional banks in Indonesia therefore is a must. Such policy measure needs not to be specified for Islamic or conventional banking industry.

Keywords: Basel III; Capital buffer; Cyclicality; Bank; Indonesia
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I. Introduction

Drawing attentions on the Global financial crisis that took place in 2007–2009, the Basel Committee on Banking Supervision (BCBS) has introduced a regulatory framework which emphasizes the need for countercyclical capital buffer in addition to the minimum capital requirements. The framework, called Basel III, seeks to increase the ability of banks to endure unexpected shocks and to maintain banking stability.

Capital buffer concerns the holding of capital above the regulatory threshold. In the Basel III framework, it consists of two components, namely capital conservation buffer (CCoB) which amounts 2.5 percent of total risk-weighted assets and countercyclical capital buffer (CCyB) which can vary from countries to countries. The capital conservation buffer is designed to guarantee that banks will raise their capital buffer over non-recession periods. Meanwhile, the countercyclical capital buffer is designed to guarantee that the ups-and-downs movement of capital buffer is proper along the business cycle (BCSB, 2010).

Countercyclical capital buffer exists when the relationship between capital buffer and the business cycle is positive. That is, banks increase capital buffer during economic expansions and consume the buffer to cover losses during economic downturns. By contrast, capital buffer is said to be procyclical when its relationship to the business cycle is negative. In this regard, banks lower capital buffer at the time of economic upturns and increase capital buffer at the time of economic recessions.

The question of whether capital buffer in conventional banking industry is countercyclical or procyclical has been subject to many studies. These include studies published before the release of the Basel III framework, such as Ayuso et al. (2004), Lindquist (2004), Bikker & Metzemakers (2005), Marcucci & Quagliariello (2008), and Jokipii & Milne (2008). Studies that were published after the release of the Basel III framework include Stolz & Wedow (2011), Prasetyantoko & Soedarmono (2010), Deriantino (2011), Coffinet et al. (2012), Guidara et al. (2013) Shim (2013), Carvallo et al. (2015) and Huang & Xiong (2015).

The number of studies examining the cyclical behavior of capital buffer in Islamic banking industry is relatively limited (Maatoug et al., 2019; Maharani & Setiyono, 2018). Maharani & Setiyono (2018) conduct an analysis investigating the determinants of capital buffer of Islamic and conventional banks in the Southeast Asian (ASEAN) and Middle-East and North African (MENA) countries. Focusing on the case of MENA countries, Maatoug et al. (2019) investigate whether the capital buffer of Islamic and conventional banks is countercyclical or procyclical. Other studies (Bougatef & Korbi, 2018;

Daher et al., 2015), while examining capital buffer in Islamic as compared to conventional banking industry, focus more on the role of risk exposure rather than the effect of the business cycle.

This paper aims to analyze the cyclical behavior of capital buffer of Islamic and conventional banks in Indonesia. More specifically, the objectives of this paper are as follows. First, to test whether capital buffer in Indonesian banking industry is countercyclical or procyclical. Second, to test whether there is a difference in the level of capital buffer of Islamic banks as compared to the level of capital buffer of conventional banks. Third, to test whether there is a difference in the cyclicality of capital buffer of Islamic and conventional banks.

This paper contributes to literature in several ways. First, this paper expands on the previous work by Prasetyantoko & Soedarmono (2010) that examines capital buffer in Indonesia –one of the largest economies in the world whose capital buffer cyclical behavior remains understudied. This paper is, however, different in that it includes Islamic and conventional banks in the sample. Second, this paper adds to the previous works by Maharani & Setiyono (2018) and Maatoug et al. (2019). However, rather than limiting itself to the analysis of capital buffer determinants or to the relationship between capital buffer and the business cycle, this paper compares the level of capital buffer of Islamic and conventional banks and looks at the possible difference between Islamic and conventional banks in term of capital buffer cyclicality.

The remainder of this paper is organized as follows. Section II discusses the theoretical framework of capital buffer cyclical behavior and earlier empirical findings. Section III describes the data, regression models and estimation methods. Section IV summarizes and discusses the results of the analysis. Section V concludes and proposes recommendations.

II. Literature Review

2.1 Background Theory

Holding a higher level of capital can be costly for a bank. The most notable costs stem from the fact that it reduces the bank's assets growth and lowers the bank's profitability, particularly in a market that is relatively competitive. Other costs stem from the fact that many investors prefer investments that are liquid and safe with moderate returns such as providing debt to a bank rather than investments that, despite offering potential high returns, are illiquid and risky such as buying a bank's equity. From the bank's point of view, it is therefore easier and cheaper to obtain debt than equity financing. Moreover, in many countries, debt has been given a more favorable tax

treatment than equity (De Mooij, 2011). Debt in the form of third-party deposits has also been benefitted from deposit insurance schemes, connoting the disadvantage of holding a higher level of capital (Kane, 1989).

However, there could be different reasons why a bank may hold a higher level of capital and maintain its capital ratio above the regulatory threshold. For example, as presented by Huang & Xiong (2015), there are three reasons for a bank to maintain its capital buffer. First, to minimize potential asymmetric information between the bank and its depositors. Having a higher level of capital will signal the bank's financial health and build up the depositors' confidence in the bank's ability to absorb unexpected shocks (Jackson et al., 1999).

Second, a bank may hold a higher level of capital to be precautionary against the risk of failure. Having a higher level of capital will allow a bank to put on guard against unexpected shocks and reduce the probability of bankruptcy, particularly by increasing its ability to cover losses during economic downturns (Nier & Baumann, 2006). Having a higher level of capital will also allow a bank to avoid the costs of failure, which include among others, the loss of charter value, the loss of the bank's reputation and goodwill, and the loss of resources during the bankruptcy process (see, for instance, Acharya (1996))

Third, to follow Ayuso et al. (2004), Milne (2004), and Milne & Whalley (2011), a bank may hold a higher level of capital to reduce the probability of violating the minimum capital requirements. By having a capital buffer, a bank protects itself against pricey adjustment costs that may arise due to regulatory threshold violations. For example, in the presence of information asymmetries, capital level adjustment via sudden equity issues may convey a negative signal to the market that the bank's stock prices are above the actual share values. Thus, in addition to the adjustment costs, pure transaction costs may include significant drops in the importance of the bank's stocks (see, for instance, Myers & Majluf (1984), Winter (1994), and McNally (1999)). Meanwhile, capital level adjustment via asset reductions may force a bank to sell profitable assets at prices far below their values or renounce potential projects that would otherwise have been financed.

Formally, the costs of capital level adjustment and the effect that the business cycle has on capital buffer can be modeled within a partial adjustment framework. To follow Ayuso et al. (2004), Jokipii & Milne (2008), Carvalho & Castro (2015) and Maatoug et al. (2019), the framework is represented by

$$\Delta \mathrm{Buf}_{i,t} = \beta\left(\mathrm{Buf}^{*}_{i,t} - \mathrm{Buf}_{i,t-1}\right) \quad (1)$$

where Δ denotes the difference or the change operator, $\mathrm{Buf}_{i,t}$ and $\mathrm{Buf}_{i,t-1}$ denote the actual capital buffer of bank i at time t and time $t-1$ respectively,

$\mathrm{Buf}_{i,t}^{*}$ denotes the optimum capital buffer of the same bank and β denotes the speed of adjustment of the bank's actual capital buffer towards its optimum level. By adding $\mathrm{Buf}_{i,t-1}$ to both sides, the previous equation can be rewritten as

$$\mathrm{Buf}_{i,t} = \beta \mathrm{Buf}_{i,t}^{*} + (1-\beta)\mathrm{Buf}_{i,t-1} \qquad (2)$$

The optimum capital buffer level (BUF∗i,t) is not observable. However, it may depend on the business cycle.

Here, the relationship between capital buffer and the business cycle can be explained using at least two different approaches. First, as suggested by Stolz & Wedow (2011), the choice between loan portfolio and capital buffer changes along with the business cycle. In upturn economic conditions, loan risk is relatively low. This induces a bank to increase its loan disbursements at the expense of capital buffer. By the same token, in downturn economic conditions, as loan risk increases, a bank will reduce its loan disbursements and increase capital buffer. Second, as stated by Amato & Furfine (2004), the choice between loan portfolio and capital buffer changes along with loan quality. In upturn economic conditions, loan quality is relatively good and the possibility of default on payments is low. This induces a bank to increase its loan disbursements at the expense of capital buffer. By the same token, in downturn economic conditions, as loan quality decreases, a bank will reduce its loan disbursements and increase capital buffer.

Similar to its conventional counterpart, an Islamic bank may hold a high level of capital to reduce the probability of violating the minimum capital requirements. While an Islamic bank is not allowed to pay or to charge interest and instead performs intermediation function using Islamic financial contracts (Askari et al., 2015; Habib, 2018), its optimum capital buffer may remain dependent on the business cycle.

In brief, the Islamic financial contracts used by an Islamic bank consists of mudarabah, musharakah, murabahah and ijarah. Mudarabah is a business partnership contract, which one partner as an investor provides capital to its partner through a profit-sharing arrangement agreed before. Profits will be shared between the investor and its partner according to the agreed arrangement, while losses will be borne by the investor. Mudarabah can be applied for both funding and financing operations. Mudarabah that is applied for an Islamic bank's funding operation does not guarantee the funds deposited by depositors. Profits obtained will be shared between the bank and the depositors, while losses will be assumed by the depositors. From the bank's perspective, this theoretically implies no risk. Meanwhile, mudarabah that is applied for financing operation is risky and may lead to an increase in the probability of a bank violating the minimum capital requirements. The risk

to the bank arises from the potential of failure payments from its partners due to business losses. The risk is low in upturn economic conditions, inducing a bank to increase its financing disbursements and reduce capital buffer. Congruently, the risk is high in downturn economic conditions, inducing the bank to reduce its financing disbursements and increase capital buffer.

Musharakah, murabahah and ijarah are applied mostly for financing operations. Musharakah is a business partnership contract in which two or more parties provide both capital and managerial ability in a pre-agreed agreement. All partners will share the profits according to the agreement, while losses will be borne to all partners according to the level of the capital provided. Murabahah is a selling contract in which a bank buys a spesific investment goods and sells it to the costumers with a payments arrangement and agreed margin at a future date. Lastly, ijarah is a rent contract in which a bank provide a services of product on leases to its customers and the customers pay for rent over a specified period. Similar to mudarabah that is applied for financing operation, musharakah contract bears risk that arises from the possobility of the failure payments from its partners due to business losses. Murabahah and ijarah bring about risk, particularly from the possibility of the failure payments from bank's customers to pay the installments rents according to the agreed arrangements. The risk is, once again, low in upturn economic conditions and high in downturn economic conditions. This induces the bank to adjust its financing disbursements to the detriment of capital buffer.

Theoretically, the risk to an Islamic bank in mudarabah and musharakah contracts can be higher than the risk to a conventional bank that performs intermediation function using an interest-based loan contract. This is particularly true in the presence of both asymmetric information and adverse selection (Khan, 2010). The risk in murabahah dan ijarah, while not exactly the same, is quite close to the risk in an interest-based loan contract. A priori, there is thus a likelihood that the level of capital buffer of an Islamic bank is higher than the level of capital buffer of a conventional bank (Maatoug et al., 2019).

2.2 Previous Findings

Previous empirical findings on the cyclicality of capital buffer tend to be ambiguous. Huang & Xiong (2015) find a positive co-movement between capital buffer and the business cycle in China, connoting the presence of capital buffer countercyclicality in the Chinese banking industry. This study also find that state-owned bank have a weaker countercyclicality than others banks. By contrast, the study conducted by Lindquist (2004), Ayuso et al. (2004), Coffinet et al. (2012), Marcucci & Quagliariello (2008) and Jokipii & Milne (2008) respectively find a negative co-movement between capital buffer

and the business cycle in Norwegia, Spain, France, Italy and Europe in general, connoting the presence of capital buffer procyclicality in these countries. Using data from the United States and 29 OECD countries respectively, Shim (2013) and Bikker & Metzemakers (2005) also find that the relationship between capital buffer and the business cycle is negative, implying the existence of capital buffer procyclicality. From Indonesia (Prasetyantoko & Soedarmono, 2010) and Southeast Asian countries in general (Deriantino, 2011), evidence has been presented that the effect on capital buffer of the business cycle is negative and that capital buffer is procyclical.

In a study covering sample from 171 developed and developing countries, Chen et al. (2014) report that capital buffer tends to be procyclical in both developed and developing countries. This is true particularly in the cases of bank holding companies and commercial banks. In the case of savings banks and cooperative banks, the effect on capital buffer of the business cycle is subject to the composition of the sample. Meanwhile, Carvallo et al. (2015) based on their study covering 13 Latin American and Caribbean economies report that the cyclical pattern of capital buffer differs across countries. Capital buffer tends to be more procyclical in countries where costs of adjustment are lower and where capital regulation is less stringent.

With respect to Islamic banks, empirical findings are also ambiguous. Examining the determinants of Islamic and conventional banks' capital buffer in the Southeast Asian (ASEAN) and MENA countries over the period 2011-2015, Maharani & Setiyono (2018) conclude that the relationship between capital buffer and the business cycle is negative. Islamic and conventional banks' capital buffer is, thus, procyclical. By contrast, in a study that examines the relationship between capital buffer and the business cycle in the MENA countries over the period 2000–2014, it has been found that Islamic and conventional banks' capital buffers are both countercyclical (Maatoug et al., 2019). It has also been found that the speed of adjustment cost is low for Islamic banks and high for conventional banks.

III. Data and Research Methods

3.1 Data

This paper uses secondary panel data that are derived mostly from the end-of-year financial reports of conventional and Islamic banks in Indonesia and from regular reports published by Badan Pusat Statistik (BPS – Statistics Indonesia). The data set is unbalanced and spreads over the period 2004-2019.

The sample in this study consists of a total 108 banks, of which 11 are Islamic banks and 97 are conventional banks. The sample is selected based on the availability of data. Banks that ceased to exist, or experienced recent conversion, or underwent a recent merger from conventional to Islamic status before the end of the period of analysis are left out of the sample.

3.2 Regression Model

The analysis in this paper is conducted using dynamic panel regressions. The regression equations in this paper are provided by

Model 1:

$$CAPB_{it} = \beta_0 CAPB_{it-1} + \beta_1 CYCLE_t + \beta_2 SIZE_{it} + \beta_3 IDIV_{it} + \beta_4 PROF_{it} + \beta_5 RISK_{it} + \beta_6 OWNER_{it} + \beta_7 TIME_t + \varepsilon_{it} \quad (3)$$

Model 2:

$$CAPB_{it} = \beta_0 CAPB_{it-1} + \beta_1 CYCLE_t + \beta_2 SIZE_{it} + \beta_3 IDIV_{it} + \beta_4 PROF_{it} + \beta_5 RISK_{it} + \beta_6 OWNER_{it} + \beta_7 TIME_t + \beta_8 ISLA_i + \varepsilon_{it} \quad (4)$$

Model 3:

$$CAPB_{it} = \beta_0 CAPB_{it-1} + \beta_1 CYCLE_t + \beta_2 SIZE_{it} + \beta_3 IDIV_{it} + \beta_4 PROF_{it} + \beta_5 RISK_{it} + \beta_6 OWNER_{it} + \beta_7 TIME_t + \beta_8 ISLA_i + \beta_9 INTER_{it} + \varepsilon_{it} \quad (5)$$

where $CAPB_{it}$ denotes the capital buffer of bank i at time t, $CYCLE_t$ denotes the business cycle in the economy, $ISLA$ denotes a dummy variable for Islamic banks and $INTER$ denotes an interaction term between the business cycle and Islamic bank dummy. The dependent variable, capital buffer, is measured as the difference between a bank's capital adequacy ratio (CAR) and the minimum capital requirement that is imposed on the bank according to its risk profile. Business cycle as the key independent variable is measured as the percentage growth of real gross domestic product (GDP). The other key independent variable, i.e. the dummy for Islamic banks, is given the value 1 for banks that operate according to the interpretation of Islamic laws and 0 otherwise. $SIZE$ denotes bank size, $IDIV$ denotes income diversification, $PROF$ denotes profitability and $RISK$ denotes credit risk. $OWNER$ denotes a vector of ownership dummy variables, $TIME$ denotes a time variable dummy, β denotes the parameters to be estimated and ε denotes the error term.

Bank size, credit risk, profitability and income diversification serve as bank specific control variables. Bank size, which is measured as the natural

logarithm of total assets, is expected to have a negative sign based on the "too big to be fail" theory. This theory suggests that larger banks dare to take greater risks and are less worry about their financial condition, so that they tend to have lower level of capital buffer (Chen et al., 2014). Credit risk, which is measured as the ratio of non-performing loans to total loans, is expected to have a positive effect on capital buffer. Higher credit risk increases the probability of failure and, hence, increases the level of capital buffer (Maharani & Setiyono, 2018). Profitability, which is measured as the return on equity, is expected to have a positive relationship to capital buffer. In order to meet the minimum capital requirements, banks prefer to use retained earnings rather than external finance (Shim, 2013). Income diversification, which is measured as Herfindahl-Hirschman Index (HHI) of bank's operating income, is expected to have a negative coefficient. Income diversification reduces the volatility of bank profits and results in less risk. This allows a bank to maintain lower level of capital buffer (Chen et al., 2014).

The vector of ownership dummy variables serves as other bank-specific control variables. It comprises a dummy for banks that are belong to the central government, a dummy for banks that are belong to provincial governments and a dummy for foreign banks. Further, the vector of ownership dummy variables also comprises a dummy for ownership concentration, which is given the value 1 for banks whose largest shareholder owns 50 percent or more of shareholdings. Ownership has been reported to have a significant effect on capital buffer (Jiang et al., 2019; Klein et al., 2021). By controlling for these variables, concerns about omitted variable bias can be minimized. The time dummy variable is included to control for time-specific fixed effects. Instead of dummies for years which suffer from collinearity issues, the dummy included is one that represents the period after the Basel III framework is effectively implemented. Its value 1 for the years 2015 onward and 0 otherwise.

3.3 Estimation Method

To implement the dynamic panel regressions, this paper employs the popular system generalized method of moments (system GMM) estimators (Arellano & Bover, 1995; Blundell & Bond, 1998). These estimators account for potential endogeneity that takes place when there is a correlation between the independent variables and error terms in the model. These estimators also account for any remaining omitted variable bias and unobserved panel heterogeneity.

The business cycle, the dummy for Islamic banks and the interaction term between the business cycle and the Islamic bank dummy are regarded as

strictly exogenous in the regressions. Similarly, all dummy control variables are regarded as strictly exogenous. Bank-specific control variables that are non-dummies are regarded as predetermined.

The system GMM estimators are valid only if the instruments included in the regressions are valid and not correlated with the residuals. To ensure that such condition is met, this paper applies the standard test of overidentifying restrictions developed by Hansen (1982). Besides, to ensure that no second-order serial correlation exists in the error terms, this paper applies the Arellano-Bond tests for zero autocorrelation.

IV. Results and Analysis

4.1 Results

Table 1 presents the descriptive statistics of the sample. The level of capital buffer in the sample ranges from -2.98 to 155.31 percent, with a mean that is equal to 15.91 percent. The level of capital buffer of Islamic banks is less diverged than the level of capital buffer of conventional banks. The average level of capital buffer of Islamic banks is also lower than that of the level of capital buffer of conventional banks.

Table 2 presents the coefficients of correlation between independent variables. For brevity reason, only the correlation coefficients between business cycle and non-dummy bank-specific control variables are displayed. Overall, the correlation coefficients are relatively small, confirming the absence of any multicollinearity issue.

Table 3 reports the regression results. In column 1, the regression includes lagged dependent variable, business cycle as the key independent variable, bank size, income diversification, profitability, and credit risk. In column 2, a dummy for Islamic banks is added into the regression. In column 3, an interaction term between the business cycle and the Islamic bank dummy is also added into the regression. The p-values presented at the bottom of the Table indicate that the Hansen test failed to reject the null hypothesis of over-identifying restrictions. Similarly, the Arellano-Bond test for zero autocorrelation fails to reject the null hypothesis of the nonexistence of a second-order serial correlation in the error terms. It is thus confirmed that the system GMM estimators being employed are valid.

Table 1. Descriptive Statistics

	N Obs.	Mean	St. Dev.	Min.	Max
Bank-specific Variables: Con. and Islamic Banks					
Capital buffer	1543	15.913	16.848	-2.980	155.310
Bank size	1543	15.942	1.798	10.953	21.018
Income diversification	1543	0.187	0.127	0.004	0.500
Profitability	1543	2.023	2.451	-15.820	41.900
Credit risk	1543	2.941	3.053	0.000	50.960
Bank-specific Variables: Conventional Banks Only					
Capital buffer	1431	16.411	17.252	-2.980	155.310
Bank size	1431	15.929	1.837	10.953	21.018
Income diversification	1431	0.187	0.129	0.006	0.500
Profitability	1431	2.087	2.415	-15.820	41.900
Credit risk	1431	2.872	3.042	0.000	50.960
Bank-specific Variables: Islamic Banks Only					
Capital buffer	112	9.549	8.071	0.300	53.980
Bank size	112	16.101	1.198	12.901	18.537
Income diversification	112	0.182	0.100	0.004	0.468
Profitability	112	1.200	2.749	-10.770	13.580
Credit risk	112	3.828	3.060	0.100	22.040
Business Cycle and Other Variables					
Business cycle	1543	5.445	0.527	4.630	6.350
Islamic bank dummy	1543	-	-	0	1
D. Ownership types	1543	-	-	0	1
D. Ownership concentration	1543	-	-	0	1
D. Global financial crisis	1543	-	-	0	1
D. Basel implementation	1543	-	-	0	1

Table 2. Correlation Matrix

	Business c.	Bank size	Income div.	Profitability	Credit risk
Business cycle	1.000				
Bank size	-0.160	1.000			
Income div.	-0.021	0.425	1.000		
Profitability	0.109	0.072	0.022	1.000	
Credit risk	-0.061	-0.002	0.050	-0.323	1.000

The coefficient of the business cycle is always negative in columns 1-3 and statistically significant at the 10 percent level. In column 2, the coefficient of the dummy for Islamic banks is not statistically significant. In column 3, the coefficients of the dummy for Islamic banks and its interaction term with the business cycle are both not statistically significant.

Table 3. Results from the Regressions

	Model 1	Model 2	Model 3
	(1)	(2)	(3)
Lagged capital buffer	0.738**	0.738**	0.738**
	(0.284)	(0.297)	(0.297)
Business cycle	-1.411*	-1.392*	-1.376*
	(0.763)	(0.771)	(0.778)
Bank size	-4.967**	-5.025**	-5.028**
	(2.076)	(2.108)	(2.107)
Income diversification	32.428*	31.836*	31.940*
	(16.647)	(16.428)	(16.538)
Profitability	-2.651	-2.705	-2.682
	(2.499)	(2.594)	(2.603)
Credit risk	-0.455	-0.490	-0.503
	(0.971)	(0.964)	(0.974)
Islamic bank dummy		-0.599	0.804
		(2.675)	(13.753)
Business cycle*Islamic bank d.			-0.255
			(2.313)
Ownership type dummies	Yes	Yes	Yes
D. Global financial crisis	Yes	Yes	Yes
D. Basel III framework	Yes	Yes	Yes
Constant	88.401**	89.549**	89.474**
	(37.476)	(38.093)	(38.138)
N Observations	1,543	1,543	1,543
N Banks	108	108	108
N instruments	17	18	19
Hansen test (p-value)	0.644	0.640	0.645
AR(2) test (p-value)	0.570	0.575	0.576
F-stats (p-value)	0.000	0.000	0.000

Note: The dependent variable is capital buffer. The values reported for each variable are coefficients and heteroscedasticity-autocorrelation-robust standard errors. *, ** and *** indicates significance at the 10, 5 and 1 percent level.

4.2 Robustness Test

The regressions reported in Table 3 do not take into account the difference between pre- and post-Basel III economic and regulatory environments. This may bias the results particularly if the effect of this difference correlates with one or more of the existing independent variables. To cope with such a concern, a dummy for Basel III framework is added into the regressions.

Table 4. Results from the Regressions

	Model 1	Model 2	Model 3
Lagged capital buffer	0.671***	0.669***	0.670***
	(0.222)	(0.222)	(0.223)
Business cycle	-1.402*	-1.398*	-1.371*
	(0.731)	(0.732)	(0.751)
Bank size	-4.727*	-4.765*	-4.780*
	(2.621)	(2.680)	(2.690)
Income diversification	30.630*	30.427*	30.598*
	(15.839)	(15.565)	(15.693)
Profitability	-2.256	-2.260	-2.250
	(1.904)	(1.955)	(1.954)
Credit risk	-0.752	-0.784	-0.794
	(0.826)	(0.802)	(0.808)
Level of intermediation	-4.411	-4.796	-4.584
	(21.259)	(21.405)	(21.538)
Islamic bank dummy		-0.083	2.301
		(1.885)	(10.901)
Business cycle*Islamic bank d.			-0.442
			(1.965)
Ownership type dummies	Yes	Yes	Yes
D. Ownership concentration	Yes	Yes	Yes
D. Global financial crisis	Yes	Yes	Yes
D. Basel III framework	Yes	Yes	Yes
Constant	89.391**	90.317**	90.233**
	(35.477)	(36.406)	(36.357)
N Observations	1,543	1,543	1,543
N Banks	108	108	108
N instruments	20	21	22
Hansen test (p-value)	0.744	0.743	0.746
AR(2) test (p-value)	0.569	0.571	0.571
F-stats (p-value)	0.000	0.000	0.000

Note: The dependent variable is capital buffer. The values reported for each variable are coefficients and heteroscedasticity-autocorrelation-robust standard errors. *, ** and *** indicates significance at the 10, 5 and 1 percent level.

Table 4 reports the results. The coefficient of the business cycle remains negative and significant at the 10 percent level. The coefficient of the dummy for Islamic banks remains not statistically significant and so is the coefficient of the interaction term between the business cycle and the dummy for Islamic banks.

Preliminary check indicates the presence of some outliers in the upper side of the dependent variable. Therefore, in addition to the regressions using original data, regressions involving an upper 99th percentile winsorization technique are implemented as a robustness test. Evidence from these regressions suggests that the results above are robust.

4.3 Discussions

The results above consistently show that the relationship between capital buffer and the business cycle in Indonesia is significant negative. The capital buffer of Islamic and conventional banks falls during economic upturns and rises during economic downturns. There is thus evidence for the presence of capital buffer procyclicality in this country.

The results above are in line with the findings by Prasetyantoko & Soedarmono (2010) and Deriantino (2011). The results above are also in line with the previous findings by Lindquist (2004), Ayuso et al. (2004), Bikker & Metzemakers (2005), Marcucci & Quagliariello (2008), Jokipii & Milne (2008), Coffinet et al. (2012), Shim (2013) that there is a negative co-movement between capital buffer and the business cycle. The results above further lend a support to the findings by Chen et al. (2014) that capital buffer tends to be more procyclical in developed and developing countries regardless of their level of economic development. The results reported in Table 3 and 4 suggest that capital buffer in Indonesia –a developing country– is procyclical. In relation to Islamic banks, the results above are in agreement with the findings by Maharani & Setiyono (2018) and against the ones by Maatoug et al. (2019).

The fact that none of the coefficients of the dummy for Islamic banks and of the interaction term between this variable and the business cycle are significant implies that no difference exists in the level of capital buffer of Islamic banks as compared to conventional banks. Similarly, the fact that none of the coefficients of the dummy for Islamic banks and of the interaction term between this variable and the business cycle are significant implies that no difference exists in the cyclicality of capital buffer in Islamic and conventional banking. Thus, despite their uniqueness for not paying or charging interest and instead performing intermediation function using Islamic financial contracts (Askari et al., 2015; Habib, 2018), Islamic banks have a relatively similar capital buffer behavior to conventional banks.

This echoes some previous findings that there tends to be no significant difference in the behavior of Islamic and conventional banks. For example, in term of bank margin (Susamto et al., 2021), efficiency (El-Gamal & Inanoglu, 2005; Hassan et al., 2009) and stability (Kasri & Azzahra, 2020).

V. Concluding Remarks

5.1 Conclusions

This paper has analyzed the cyclical behavior of capital buffer of Islamic and conventional banks in Indonesia using dynamic panel regressions. In line with

theoretical predictions, the results provide evidence that the capital buffer of Indonesian banking industry is significantly affected by the business cycle. The capital buffer of Indonesian Islamic and conventional banks as a whole is procyclical. The results however fail to provide evidence for the presence of a difference in the level of capital buffer of Islamic banks as compared to conventional banks. The results also fail to provide evidence that there is a difference in the cyclicality of capital buffer of Islamic and conventional banks. Thus, different from theoretical predictions that the level of capital buffer of Islamic banks is higher than the level of capital buffer of conventional banks, Islamic banks have a relatively similar capital buffer behavior to conventional banks.

5.2 Recommendation

The results in this paper suggest a deviation from the Basel III regulations. Therefore, if the countercyclical capital buffer as determined by the Basel III framework is to be achieved, a policy measure aimed to alter the cyclical behavior of capital buffer of Islamic and conventional banks in Indonesia is a must. The results in this paper also suggest that such policy measure needs not to be specified for Islamic or conventional banking industry. Aside from Islamic banks' distinct characteristics, the level and the cyclicality of capital buffer in Islamic banking industry are not significantly different from the level and the cyclicality of capital buffer in conventional banking industry.

This paper relies on annual growth of real GDP to measure business cycle. This may not fully capture the effect of the business cycle. Future research should attempt to examine the cyclical behavior of capital buffer using more frequent dataset. Future research should also attempt to look deeper into the details of the cyclical behavior of capital buffer before and after the Basel III framework is implemented.

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