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Measuring Procyclicality Behavior on Islamic and Conventional Banks in Indonesia

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Abstract

Research Originality: This study contributes to capturing credit cycle movements during the COVID-19 pandemic and compares sizes of credit and business cycles to promote banking stability.

Research Objectives: This study attempts to examine banking behavior on amplitude and frequency indicators by focusing on the credit property of Islamic and conventional banks.

Research Methods: This study utilizes ordinary least square regression and time series analysis on monthly data from 2014 to 2020 to examine the procyclical behaviour in both Islamic and conventional banking. The construction and measurement of generated cycles are achieved through the utilization of frequency-based filtering and turning point analysis.

Empirical Results: This study unveiled that the size of an Islamic bank's amplitude was higher than conventional bank's amplitude. Meanwhile, the size of the frequency of Islamic banks had a longer frequency than conventional banks, given Islamic banks rely on real sector-based financing which has a longer period of economic expansion.

Implications: It is also argued that conventional banks have a riskier leverage indicated by a higher percentage of amplitude. Thus, it is recommended to Indonesian banking sectors to promote the growth of Islamic banks to achieve financial stability. This research is significance in showing the Islamic banking's contribution on stability given Indonesia is taking serious effort becoming the epicentrum of Islamic finance growth in the world.

Keywords:
Amplitude, Conventional Banks, Cycle, Frequency, Islamic

How to Cite:

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INTRODUCTION

During a pandemic, many studies focus on the impact of the country's pandemic death rate on its economic growth. The growth in the economic sector is represented by a rate of GDP or real per capita consumption. The Great Influenza Pandemic of 1918-1920, known as Spanish-Flue, declined by 6% for GDP and 8% for private consumption. These economic declines were comparable to those last seen during the global financial crises in 2008-2009. On this occasion, the possibility exists of unprecedented numbers of deaths and significant global economic turmoil (Barro et al., 2020).

The financial crisis, market failures, and economic bubbles have repeatedly occurred. Those phenomena were triggered by the development of a modern financial system that began after the Bretton Woods Agreement collapsed in August 1971 (Ascarya et al., 2016). In line with the statement expressed (Bordo et al., 2001), after the Bretton Woods Agreement collapsed in 1971 when the standard system of currencies converted to gold collapsed, financial crises frequently occurred more and had a systemic impact that increased even wider spread. Since the Bretton Woods Agreement collapsed in 1971, there have been at least 431 financial crisis events that hit the world, consisting of 153 exchange rate crises, 100 banking crises, and 18 debt crises. Moreover, a composite crisis comprised 68 twin crises and eight triplet crises. Specifically, banking crises are the second most recorded in the case of financial distress (Valencia & Laeven, 2008).

Financing is vital to banking intermediation and its operation in financing the progress of national economic growth. Credit availability allows households to consume and companies to conduct investment activities, which are very difficult if only financed with personal funds (Wiranatakusuma & Duasa, 2016). When economic growth increases, and macroeconomic stability is maintained, the confidence and optimism of the market to transact capital will continue to increase, thereby encouraging increased credit growth (Utari et al., 2012). Lately, banks have suffered more impact relative to other sectors in comparison with previous crises. Despite the recent partial recovery, the decline of bank stock prices is currently on a par with that over an equal period following the collapse of Lehman Brothers in 2008. Consistent with these developments, banks' long-term rating outlooks have begun to deteriorate, reflecting concerns over the impact of the COVID-19 pandemic on bank earnings (Aldasoro et al., 2020).

An increase followed the sluggish domestic economy in problem financing (NPL), encouraging banks to behave more rationally and carefully channel their loans to the business world. Moreover, entering the period of current economic stagnation, businesspeople tend to refrain from applying for credit transactions in the banking sector. However, the problem arises if a significant credit growth increase exceeds normal. In this sense, banks are categorized as triggering a crisis in the monetary sector that has a further impact on the real sector, and this is what the economy calls a procyclical movement.

The procyclicality is known as a big issue with many roots, such as the tendency to make a more understanding assessment of risk-taking behavior, and it can be used as a prominent indicator of which the procyclicality will be categorized as bad or good

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procyclicality (Buesa et al., 2020). *Procyclicality* is a phenomenon that enlarges feedback between the financial system and macroeconomic conditions. Besides, procyclicality in the banking system refers to the interaction of the actual banking and economic system that mutually reinforces and tends to strengthen the amplitude of the business cycle. It denotes that procyclicality is one of the important sources that cause systemic instability in the financial system, as pointed out by Landau (2009), Bank for International Settlement (2010), Jeong (2010), and Ascarya et al. (2016).

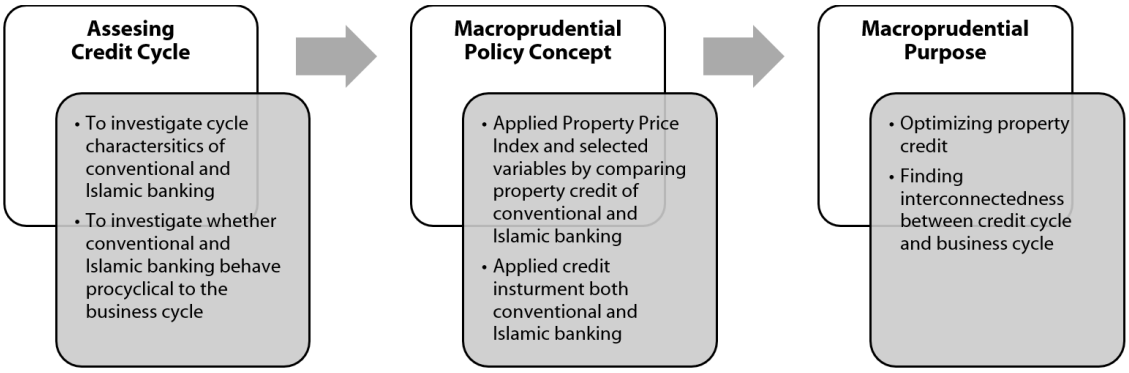
This phenomenon will later exacerbate an unsustainable boom, which will occur when the boom period becomes a bust. From measuring systemic risk, Minsky's thinking supported the systemic risk due to procyclicality (Adrian & Brunnermeier, 2011). According to this issue, the systemic ratio is born not when the volatility is high. However, on the contrary, it occurs when there is low volatility as a starting point, or it can be called paradox volatility, leading to an increased amplitude. The amplitude in the cycle of economic activity refers to the relationship between the economic periods of the boom and bust. The boom period indicates a positive amplitude in banking procyclicality towards economic activities. Meanwhile, bust denotes the occurrence of negative amplitude in banking procyclicality toward economic activities (Dupraz et al., 2019). The positive or negative amplitude of the economic activity cycle towards the credit cycle is based on the extent to which bank credit capacity can encourage economic activities when economic conditions lead to expansion or contraction (Oman, 2019).

Since Islamic finance and banking have rapidly grown, the requisite for research and studies related to Islamic studies and its perspectives are increasingly being sought. It is driven by the increasing number of stakeholders requiring studies as financial practices are increasingly being applied to the financial and banking sectors. Moreover, given that research on macroprudential policy, both Islamic and conventional banking has increased considerably. Nevertheless, the literature on monetary policy under the dual banking system has yet to be available (Zulkhibri, 2019). Zulkhibri & Sakti (2018) pointed out, their study suggests and provides evidence that while conventional banking is procyclical, Islamic banking is not procyclical in its financial behavior. During economic downturns, Islamic banking is counter-cyclical to conventional banking. The study supports the other evidence research by Farooq and Zaheer (2015). In Indonesia's case, Islamic banking has stabilized its financing during the recent economic recession. It is understood that Islamic banking in Indonesia is counter-cyclical, while conventional banking is procyclical in financing. For this reason, different policy responses may be needed to maintain Islamic and conventional banking, especially during economic downturns.

The study on procyclical behavior during the COVID-19 pandemic still needs to be explored regarding how an exogenous variable might stimulate financial turbulences. Procyclical lending is a crucial topic since they are systemic to amplifying the business cycle. The 1997/1998 Asian financial crisis and the 2008/2009 global financial crisis were identified as another potential cause of procyclical lending (Wheeler, 2019). Given what the random walk of the business cycle explains, the fluctuation can capture an understanding of economic movements. However, the study on measuring amplitude and

frequency sizes has yet to be explored. When banks underestimate the boom period and overestimate the downturn, this is likely a financial crisis stimulus (Leroy & Lucotte, 2018). This condition represents that financing in banks, both Islamic and conventional sectors, is responsible for financial vulnerabilities. Capital misallocation between Islamic and conventional operational lending schemes stimulates macroeconomics amplification of the business cycle. By understanding credit-driven fluctuation through amplitude and frequency indicators, banking regulators can intervene to smooth cycle fluctuations in facing economic movements (Lubello et al., 2019). Therefore, this study will promote significant research to answer the gap in procyclical lending behavior by measuring amplification sizes of amplitude and frequency indicators in both credit cycle and business cycle.

Figure 1. Conceptual Framework



Many scholars believe there is interconnectedness between conventional and Islamic banking systems in responding to macroprudential policy under the dual banking system regime (Saadoui & Hamza, 2020). In the dual banking monetary system, a few studies have been conducted on the capability of Islamic banking stability to the business cycle (Ascarya et al., 2016; Ibrahim, 2016; Zulkhibri & Sakti, 2018; Hadian, 2017; Aysan & Ozturk, 2018; Soedarmono et al., 2017). To find the characteristics of credit and business cycles, this study will overcome the literature gap on the procyclical behavior of conventional and Islamic banking in addressing property credit after identifying credit cycles. Based on the proposed model, this study expects to understand a comprehensive macroprudential policy framework for taking monetary policy responses by assessing credit cycle channeling. The objectives of this research are achieved using the two approaches. First, the proposed study is set to investigate whether Islamic and conventional banking in Indonesia follow procyclical lending movements in business cycles. Second, the proposed model would like to compare credit cycle characteristics of Islamic and conventional banking mirrored by amplitude and frequency indicators following business cycles.

This paper is structured as follows: In section 1, we provide the motivation and objectives of our study. Section 2 details the data and quantitative techniques we have applied. In section 3, we present the empirical results and our analysis of the evidence.

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Finally, in Section 4, we draw our conclusions and provide recommendations based on our findings.

METHODS

To identify the procyclicality of the credit cycle in Islamic and conventional banking, this study employed OLS (ordinary least square) and classical assumptions using time series data. This study set up model specifications by following Utari et al. (2012) and Ascarya et al. (2016). The authors modified the model by using Real GDP as the forming variable of the business cycle and property credit/financing as the forming variable of the credit cycle. If banks behave procyclicality, credit/financing growth (demand side) is procyclical due to a positive sign on GDP growth (supply side) (Craig et al., 2006 in Ascarya et al., 2016).

$$PCONV_t = \beta_0 + \beta_1\ GDPREAL_t + \beta_2\ PPI_t + \beta_3\ NPL_t + \beta_4\ IR_t + \in_t \quad (1)$$

$PCONV_t$ = Property Credit of Conventional Banks
$\beta_1\ GDPREAL_t$ = Gross Domestic Product Real
PPI_t = Property Price Index for Residential
NPL_t = Non-Performing Loan
IR_t = Interest Rate (BI 7 Days Repo Rate)
$\in_t$ = Error Term

$$PSY_t = \beta_0 + \beta_1\ GDPREAL_t + \beta_2\ PPI_t + \beta_3\ NPF_t + \beta_4\ IR_t + \in_t \quad (2)$$

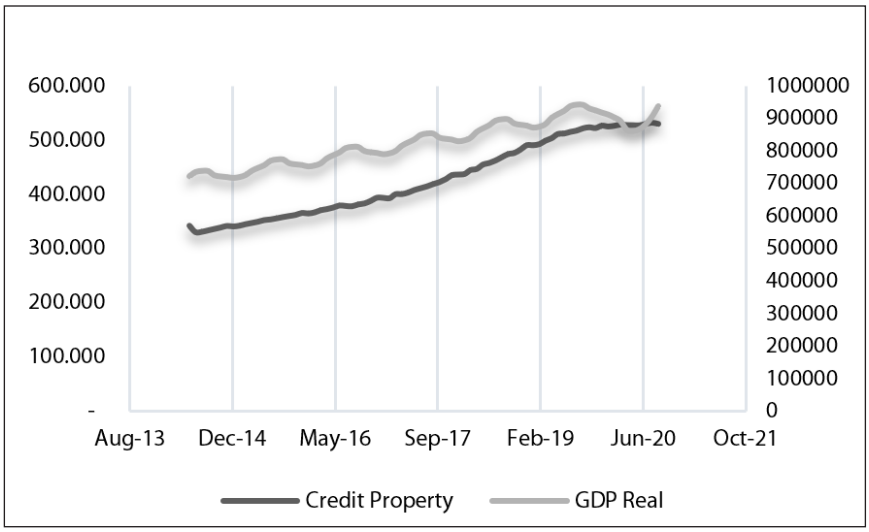
PSY_t = Property Credit of Islamic Banks
$\beta_1\ GDPREAL_t$ = Gross Domestic Product Real
PPI_t = Property Price Index for Residential
NPF_t = Non-Performing Financing
IR_t = Interest Rate (BI 7 Days Repo Rate)
$\in_t$ = Error Term

This study aimed to examine Islamic and conventional banking credit cycles in Indonesia. The period used was from 2014M06 to 2020M09. The selection of the period from 2014M06 to 2020M09 was considering available data and identifying recent historical empirical studies. In addition, the data selection considered the tendency of variables to fluctuate around trends during economic cycles, which means increasing procyclicality with a broader amplitude (Landau, 2009). From 2014 to 2020, the economy faced unanticipated shocks in the form of COVID-19, which reinforced the interaction between the financial system and the real economy. According to Ascarya et al, (2016), this condition influences the business, financial, and risk-taking behavior cycles. Therefore, the period explains the procyclicality behavior in the banking system and captures the change of amplitude and frequency in the cycles. Meanwhile, the variables were the total credit property, the total distribution of Islamic bank financing, and real gross domestic

real (GDP). Total credit distribution and bank financing were utilized as proxies for the credit cycle, while real GDP was the proxy used to compile the business cycle.

Drehmann et al. (2012) and Galati et al. (2016) found that a composite financial cycle exploiting credit growth and house price co-movement is the best indicator of systemic banking crises for G-7 countries over the past fifty years. According to Aikman et al. (2015), the major data used to compile the credit cycle is credit/financing data. Drehmann et al. (2012) and Wimanda et al. (2012) suggest that the determination of the financial cycle is closely related to the total financing of an economy because total financing is one of the main drivers of economic expansion in influencing the accumulation of systemic risk. Furthermore, Drehmann et al. (2012) stated that ideally, the loans used include total financing from dominant sources, not only banks. However, bank credit is Indonesia's largest source of financing, with a capacity greater than 60%. Therefore, it is interesting to compile the credit cycle using data on total credit financing both in Islamic banks and conventional banks.

Figure 2. Credit Property (Top) and Financing Property (Bottom) in Million (IDR)



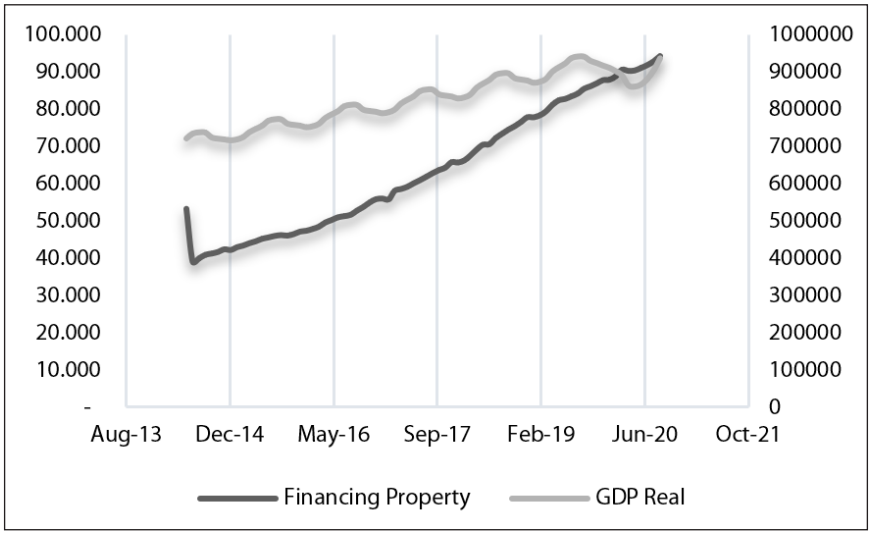


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Figure 2 demonstrates the gap between business cycles, represented by real GDP and financial cycles, represented by financing or credit in property sector. The credit cycle is a proxy to compile the financial cycle (Borio, 2014). According to Claessens et al. (2011), credit is the most important variable that represents the formation of the financial cycle. Meanwhile, for the case of Indonesia, one of the compilers of the financial cycle is the total lending Wimanda et al., (2012). Therefore, in line with the research conducted by Drehmann et al. (2012), the financial cycle used in this study was medium-term frequencies, while the business cycle employed short-term frequencies. It was based on the results of the calculation of both standard deviations. As Aikman et al. (2015) asserted, if the ratio of deviation of the compiler of the financial cycle is higher than the standard deviation of the variables comprising the business cycle, the second variable has different dynamics.

In its calculations, there are several types of filter options (band-pass filters), including Fixed Length Symmetric (Baxter-King), Fixed Length Symmetric (Christiano-Fitzgerald), and Full-Length Symmetric (Christiano-Fitzgerald). This filter was used to isolate the cycle component of the time series by determining the range for its duration. Overall, band-pass filters are linear filters that take two-sided moving averages, which are limited by the size of the lower and upper limits. The results of this filter would come out in the form of complex values that form the cycle. The first step taken in using the band-pass filter was determining the duration of the research data to be passed. This range was described by formulas (PL, PU), determined in units of work file frequencies in E-views. For example, in a study, it is believed that the range used in filtering GDP data (as a business cycle constructing variable) is between 1.5 and 8 years. If the data is used quarterly, the range to be used is six as the lower limit of the range (PL) and 32 as the upper limit of the range (PU).

As identified by Wimanda et al. (2012), Melville (2017), and Alamsyah et al. (2014), the short-term period for the business cycle is 1.5 to 8 years. In contrast, the range in the medium term for the financial cycle is 8 to 20 or 8 to 30 years. The data filtering method used in this study was a frequency-based filter (Fitzgerald & Christiano, 2003). The data assumptions used were stationary, and there was no trend (drift) for all data, both total financing, total credit, and industrial production index (IPI). This step was taken to facilitate the interpretation of data (Wimanda et al., 2012). The variable financing and total credit compilation (as a credit cycle preparation variable) were filtered in the medium term. They determined these limits by considering data availability, with the objectives to be achieved in this study. At the same time, the GDP real variable (as a business cycle variable) was filtered in the short term.

Turning point analysis was done using the Microsoft Excel 2010 analysis tool. This method was used to identify peak and trough points as applied (Harding & Pagan, 2002). The algorithms used in this study were a BBQ algorithm developed (Harding, 2008) and an NBER (National Bureau of Economic Research) based on the economic turning point of the United States. The original version of the BBQ Algorithm program employed in the GAUSS and MATLAB applications written by James Engel is available

on the NCER page. Then, the IMF (International Monetary Fund) study institute created a BBQ algorithm in Excel. The first step that should be performed was the potential peak points identified at time t by fulfilling the rules (yt - yti) > 0 and potential troughs identified at time t by fulfilling the rules (yt – yti) < 0. The second step was to filter out local extreme points in the previous step. It was carried out to ensure the criteria for a minimum distance of one cycle (from the peak to the trough point and the next). Then, the final output of this process would focus on analyzing the duration, amplitude, and slope. =Frequency is the number of perfect cycles that occur throughout one period. One cycle can be said to be perfectly formed when it moves from the peak point through the trough and returns to the peak point again (Peak to Peak); in addition, from the trough, through the peak, and will return to the trough (Trough to Trough). Amplitude can be understood as measuring the percentage change in a financial variable (Yt) from the peak point to the trough point, which is, in this case, called the contraction amplitude. Meanwhile, the expansion amplitude measures the percentage change in the financial variable (Yt) from the trough point to the peak point.

RESULT AND DISCUSSION

Lessons learned from the global financial crisis over the past ten years have raised many studies and literature regarding the formulation of macroprudential policy. Two main channels are existing to capture financial distress in the 2008/2009 global financial crisis. The first is the use of potentially short-term funding and the fragilities in the financial system. Second, the lending boom was unpredictable to the household sector, which began in the mid-2008s, as pointed out by Edge and Liang (2019), Bernanke (2018), and Aikman et al. (2019). Related to this study, the household sector needs to be more elaborated. Most of these studies concluded that an unprecedented surge in US household debt was running up into the Great Recession. That boom period was accompanied and amplified by soaring property prices. Moreover, the COVID-19 pandemic, which has a unique nature crisis, accounts for an ant-mainstream approach to dealing with it; it cannot be generalized as in previous studies (Shabir et al., 2023). In this sense, the selected data of this study can also capture a special case study during the COVID-19 pandemic pertaining to banking performance and its characteristics.

Macroprudential policies are intended to limit systemic risks by addressing the two key externalities of the financial system, namely interlinkages and common exposures among financial institutions, which can build up joint failures and procyclicality behavior (Meuleman & Vennet, 2020). As discussed in the study background, procyclicality may stimulate the emergence of an unsustainable boom that can magnify disruption during a time of deep economic recession. Nonetheless, not all procyclicality is categorized as a negative term when taking monetary policy responses. An understanding of the credit cycle must be distinct from the terms of the financial cycle. Many studies state that credit is the primary variable forming the financial cycle. Many studies regarding the credit cycle are also motivated mainly by the desire to find out whether credit cycle movement is one of the primary sources of the financial crisis (Coimbra & Rey, 2018).

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Due to competitive markets, banks need to be prudent in setting lending patterns. Current literature may highlight that both banks demand the ability to deal with shocks. Some literature promotes that Islamic banks are to follow conventional banks. However, Islamic banks are different in their objectives; they are beyond profit maximization, which also promotes social wealth and justice (Mansour et al., 2015). Thus, examining the procyclical behavior of both banks will contribute to the literature.

Table 1. Summary Statistic for the Data Available

Variable	Mean	St. Dev	Minimum	Maximum
GDP Real (GDPREAL) - Billion	826415.3	67631.4	715580.1	941265.9
Property Price Index (PPI) - Index	880.4931	2269.551	-952.995	7994.107
Interest Rate (IR) - Percentage	5.766	1.270	4.000	7.750
Credit Property (PCONV) - Billion	413256.5	68637.08	304969	528590
Non-Performing Loan (NPL) - Billion	11269.43	2411.04	7189	16978
Financing Property (PSY) - Billion	63846.7	17095.05	39047	94301
Non-Performing Financing (NPF) – Billion	1637.355	378.277	1166	2697

According to Table 1, the research findings show that Islamic and conventional banks were procyclical to the business cycle. It can be seen by testing the Ordinary Least Square (OLS) model that the study found a positive relationship between the credit cycle and the business cycle. Property financing in Islamic and conventional banks significantly affects the Gross Domestic Product (GDP) growth. Besides, NPF/NPL and PPI (Property Price Index) also revealed a positive relationship between conventional and Islamic banking. The increase of NPL/NPF significantly raised property credit/financing. Therefore, it implies that procyclical behavior in Islamic and conventional banks creates bubbles. On the other variables, the interest rate significantly would not decrease property financing in Islamic banks. However, interest rates significantly would increase property credit in conventional banks. The composite property price index was used to measure the extent to which credit ratings depend on collateral, and NPL/NPF was employed to investigate risk indicator proxy for credit property. In addition, Utari et al. (2012) have sought to assess the banking procyclicality by using credit as a financial cycle proxy. Their study uncovered that NPL (NPF in Islamic banks) had a negative relationship expectation to the business cycle; otherwise, the property price index had a positive relationship expectation to the business cycle.

In Table 2, the authors found a similar result for the property price index but a different result for NPL/NPF. Both conventional and Islamic banking were procyclical to the business cycle. Property price represents asset price since the property is the principal form of collateral required for obtaining credit (Craig et al., 2006). Compared with the previous studies, this study has found the opposite fact: Islamic banks face financial distress or crises concerning credit/financing bubbles compared to conventional banks. Landau

(2009) and Ascarya et al. (2016) have examined that the procyclicality of Islamic banks was not categorized as bad procyclicality, which can amplify and increase the amplitude of the business cycle, create bubbles, and cause financial instability. Nevertheless, this study obtained different facts by having updated issues and data. During the financial distress (COVID-19 pandemic), Islamic and conventional banks contributed to the financial bubbles.

Table 2. OLS Results of Islamic and Conventional Banks Model

Variable	Conventional		Variable	Islamic	
	Coefficient	Probability		Coefficient	Probability
GDPREAL	0.278659 ***	0.0001	GDPREAL	0.121949 ***	0.0000
PPI	-0.529629	0.5702	PPI	0.667495 ***	0.0010
NPL	24.62439 ***	0.0000	NPF	22.08031 ***	0.0000
IR	0.1056433 ***	0.0000	IR	-0.7761833 *	0.0891
R^2	0.952209		R^2	0.965883	
Adjusted R^2	0.949517		Adjusted R^2	0.963961	

*) Significant at the 0.10 level **) Significant at the 0.05 level; ***) Significant at the 0.01 level;

The study by Aysan & Ozturk (2018) analyzed the procyclical differences between Turkish Islamic and conventional banks. Their study reported no significant difference from 2005 to 2012. Furthermore, the study empirically found that the competition in Turkish banking services has spurred lending procyclicality. Indeed, the study concluded that, as opposed to the ideal objectives of the research, it may add to the lending procyclicality in the dual banking system. It conflicts with the stabilizing role of Islamic banks during the time of economic downturns on the stability view of the Islamic banks. Hence, alternative welfare analyses could be useful for unraveling the cost and benefits of cycles in Islamic bank lending.

Ascarya et al. (2016) have also sought to explore that procyclicality behavior as measured by the Granger Causality method and concluded that the procyclicality behavior of Islamic banks, providing a large-amplitude boost, did not reflect the creation of a bubble and caused systemic instability in the financial sector. Meanwhile, the procyclical behavior of conventional banks is categorized as creating bubbles that can accommodate systemic risk and financial instability. In addition, Landau (2009) states that not all banking procyclical behavior leads to a big boost in the real sector or strengthens the drive for the economic activity cycle (business cycle) that accumulates a crisis. The study categorized the type of procyclicality into two types: bad and good procyclicality. It indicates that not all procyclicality is bad. It all depends on the causal link: Is the financial system the origin or the amplifier of destabilizing dynamics? Alternatively, does it simply react to cyclical evolutions in the real economy? In addition, "intrinsic procyclicality" should only be concerned with what is created inside and by the financial system.

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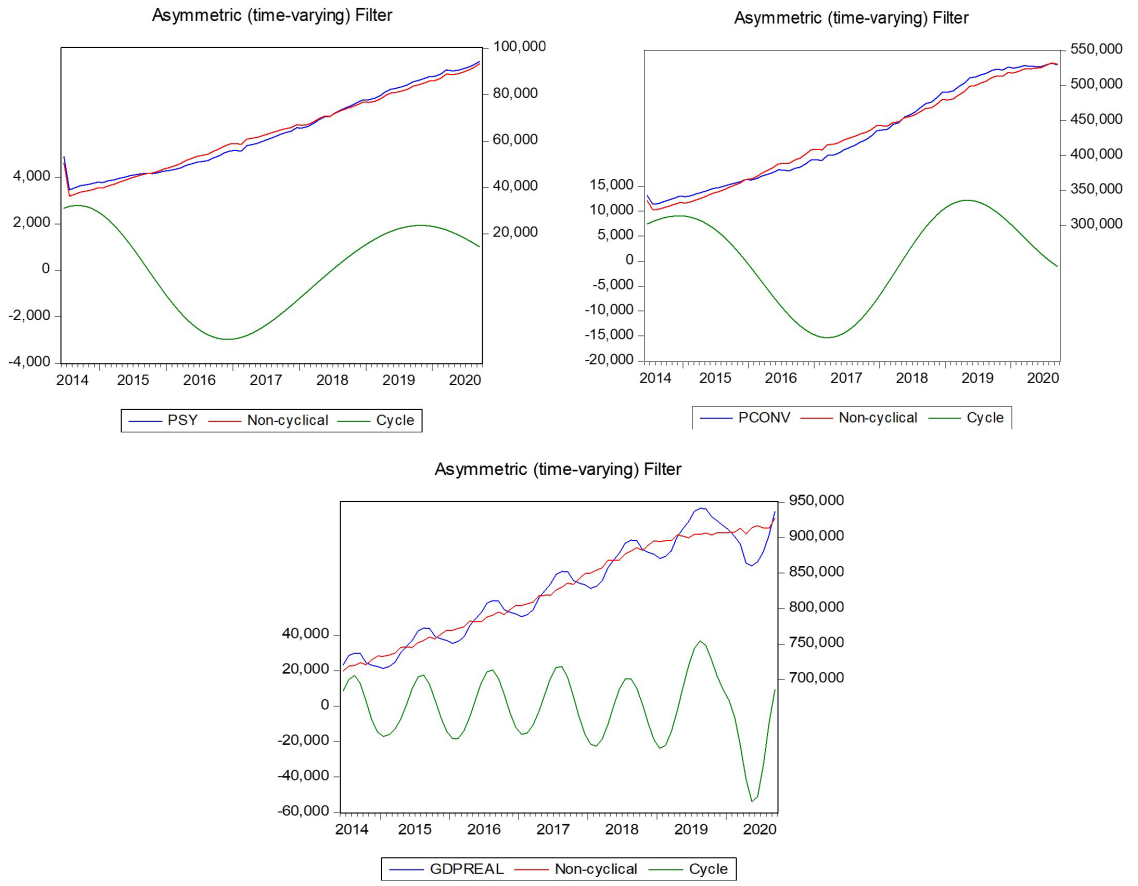
Table 3. Comparing Ratio Standard Deviation

Selected Variable	Standard Deviation	Ratio Standard Deviation
Credit (Financial Cycle)	68362.86	0.163
Financing (Financial Cycle)	16982.17	0.266
GDP Real (Business Cycle)	67184.99	0.081

To determine the period in analyzing the financial cycle, from Table 3, this study calculated the standard deviation ratio between forming variables of the financial cycle and forming variables of the business cycle. If the ratio of the standard deviation of financial cycle variables is higher than the standard deviation of business cycle variables, financial cycle variables have different movements to the business cycle. This model refers to studies that have been shown by Aikman et al. (2015), Drehmann et al. (2012), and Alamsyah et al. (2014). As pointed out in the methodology section, the detrending data process was carried out by using the Band Pass Filter - Full Sample Asymmetric (Christiano-Fitzgerald) on E-Views 11. In addition, it was assisted by utilizing Microsoft Excel as a step to find out the specific size of the credit cycle.

Figure 3. Frequency-Based Filter by Using E-Views



From Figure 3, we can see the pattern differences of formed cycles. The development of Islamic finance in Indonesia has its advantages, including banking, which is market-driven and has a button-up push in meeting the needs of society so that it relies more on the real sector. Compared with financial developments in several countries, such as Malaysia, Saudi Arabia, and Iran, which are more dependent on the monetary sector and not on the real sector, the government is highly dominant in driving growth in terms of regulation and placement of potential assets. It is also based on the belief that Islamic banks can provide more tangible benefits (*maslahah*) in encouraging equality and economic growth.

Several characteristics illustrate that Islamic banking is the primary driver of the real sector. First, the characteristics of the products offered by Sharia repair using underlying transactions in the real sector provide an understanding that Islamic banks provide a real boost to the real sector. Second, all the products offered by Islamic banks do not have speculative (*gharar*) characteristics, so they can be said to resist a direct hit to the global financial crisis. Thus, Islamic banking encourages the creation of a stable financial system and national economic growth. Third, determining profit sharing, a distinctive characteristic of Islamic banks, can bring fairer benefits for fund managers, depositors, and debtors.

It is the reality faced by Islamic banks that most assets come from capital (capital-based operations), such as deposits and customer deposits. It starkly contrasts conventional bank operations in that a sizable proportion of capital is accommodated from interest gains. Since it is currently conventional banks that create much money, more than that, based on the characteristics of this Islamic bank, capital capacity in Islamic banks will accumulate to encourage an increase in demand, which in turn has the potential to create vital feedback (Landau, 2009). The business model disparity between Islamic and conventional banks leads to variations in leverage procyclicality. Confirming the procyclical lending and analyzing credit patterns are crucial factors contributing to financial stability in the dual banking system. (Hammami & Riahi, 2021).

At the end of 2019 and early 2020, Figure 4 gives information about the Indonesian economy, which was in an economic downturn, which can be shown by forecasting the domestic economy and global economic condition. As known, several countries are working to deal with the effects of financial stress and political uncertainty between China and the US economic war. These constraints have made global trade growth the weakest in 2019 since the financial crisis a decade ago. The trade war is a major problem today because China and the US are at war as two world economic powers. It causes other countries to have bad sentiments in the import-export process. While nearly every economy faces headwinds from the trade war, the poorest countries face the most daunting challenges due to fragility, geographic isolation, and deep-seated poverty.

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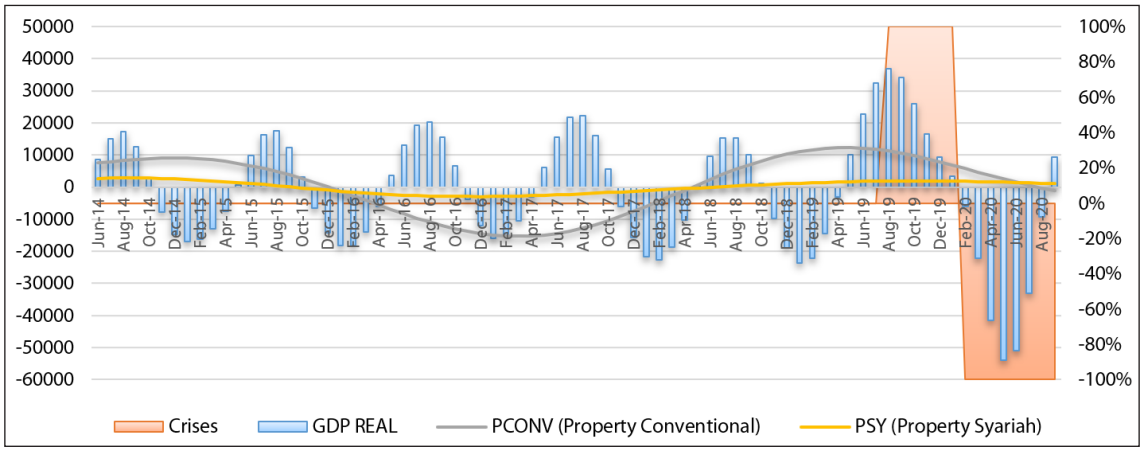
Figure 4. Credit Cycle and Business Cycle Comparison



In addition, it captures that the decline occurred when viewed from the period of economic growth in the fourth quarter of 2019, which was only 4.97%. It was lower than the growth in the fourth quarter of 2018, which amounted to 5.17%, and the growth in the third quarter of 2019, which was 5.02%. Moreover, as a matter of fact, at the end of 2019, Indonesia faced a democratic election in voting for the new cabinet president. For this reason, political will has also affected the economic condition. In addition, Indonesia's economic growth decline is inseparable from the four main trading partner countries whose economies have slowed down throughout 2019, namely Singapore, China, South Korea, and the United States. This condition denotes that the global economy is still weak and unstable due to weak global trade, particularly the unstable investment and financial sectors.

Table 4 represents the characteristics of the business cycle and credit cycle. It compares the average duration of a perfect cycle, how many peaks and troughs formed during the period (indicating a turning point from expansion to contraction period and vice versa), and the average amplitude in both expansion and contraction phases. Using the BBQ algorithm, defining a perfect cycle indicates the cycle pattern in the expansion and contraction phases. The duration of each cycle counts as the number of cycles that form turning points during economic booms and recessions. In addition to the magnitude of a formed cycle, it is indicated by the size of the average amplitude of the cycle. This study finds different results for the credit cycle depending on the selected data. The credit cycle uses a log data aggregation, and the business cycle applies an original data aggregation..

Table 4 also shows that the credit cycle for conventional banks accounts for having fewer formed cycles than the credit cycle for Islamic banks and business cycles. Interestingly, the credit cycle for Islamic banks and the business cycle are identical. Even though the credit cycle for Islamic banks has a similar formed cycle to conventional banks, they have a very different average amplitude. Conventional banks have a higher average amplitude in both contraction and expansion phases than Islamic banks. Islamic banks have a more precipitous pattern. Compared to conventional banks, the cyclical

leverage of Islamic banks is smoother than conventional banks. In terms of the number of perfect cycles, conventional banks have only three perfect cycles, less than Islamic banks and business cycles. Conventional banks need more time to reach a perfect cycle than Islamic banks.

Table 4. Characteristics of the Short-Term Components Identified by the Bry-Boschan Quarterly (BBQ) Algorithm

Component	Duration				Amplitude	
	Number of Quarters				In Percent	
	Average Duration of Contraction	Average Duration of Expansion	Cycle		Average Amplitude of Contraction	Average Amplitude of Expansion
			Peak-Peak	Trough-Trough		
GDP Real	5.6667	5.8571	6	6	32779.8607	58926.0071
Credit Property (Conventional Bank)	2.25	16.75	3	4	3085.8342	50753.8578
Credit Property (Islamic Bank)	3.8571	8	6	6	250.8149	465.5266

It can be concluded that Islamic banks displayed more volatile procyclical behavior during the study period. However, since they have a precipitous cycle pattern, they may not have an intense contraction during economic downturns. Conversely, conventional banks have a less volatile pattern than Islamic banks, meaning that they behave riskier when financial distress hits and leads to an intense contraction. These findings support a previous study done by Wimanda et al. (2012), Melville (2017), and Alamsyah et al. (2014) that the financial cycle represented by lending facilities in banks need more time to reach a perfect cycle; it could be 8 to 20 years or even between 8 to 30 years. The business cycle is between 1.5 and 8 years. However, based on the findings, Islamic banks cannot be in line with the financial cycle pattern. They behave similarly to a business cycle. In this sense, Islamic banks have a lower leverage movement of the cycles.

Procyclicality lending means supply-driven changes in lending that amplify the business cycle. This is a motivation in which banking procyclicality to the business cycle is very important (Wheeler, 2019). Therefore, the result captures macroprudential measurements, including procyclical capital requirements and asset quality during economic and financial downturns (Aysan & Ozturk, 2018). This study also can be preliminary research to understand the sensitivity of credit or lending to the business cycle. Individual characteristics could promote policy recommendations on credit policy regarding banking procyclicality (Leroy & Lucotte, 2019). This study considers data from the dual banking approach to explain the objective of the research. This study is also motivated by the interconnectedness between the Islamic and conventional banking systems in stabilizing bank lending. Procyclicality in the banking system leads

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to expansionary conditions when the economy is growing and contraction conditions when the economy is in decline. The interaction between the banking system and the economic system affects the amplitude size of the economic activity cycle. The size of the excess cycle amplitude provides an understanding that there is procyclicality behavior, which in turn will encourage high credit growth. The phenomenon of procyclicality in this condition is the main cause of the economic and financial crisis. However, not all procyclical phenomena are to be avoided and have a bad impact on economic growth. It depends on the causal relationship between the two (Landau, 2009). The intrinsic procyclicality created from within the financial system itself leads to accumulated credit growth, which needs to be monitored. Suppose the procyclicality that occurs is driven by the existence of financing channeled to the real economy.

Research on the credit cycle is mainly motivated by finding out whether the movement of the credit cycle is one of the sources of financial crisis. Public opinion states that the crises in Indonesia that occurred at the end of this decade, such as the monetary crisis in 1997/1998, the mini-economic crisis in 2005/2006, and the global financial and economic crisis in 2008/2009, were caused by vulnerabilities in the banking system. Nevertheless, the understanding of what is meant by the banking credit cycle is still quite diverse, depending on the study focus of each research being built. The financial crisis, which has accumulated from the banking sector's vulnerability (particularly in credit) over the last 30 years, has become the main trigger for the global crisis. In fact, in Chile (1982), Denmark, Finland, and Sweden (1990/1991), the East Asian crisis, which had a major impact on Thailand and Indonesia (1997/1998), was initiated by a credit boom (Utari et al., 2012). Moreover, in many cases, specifically in Indonesia, several monetary policies are oriented towards a low inflation rate and fiscal policies that encourage supply-oriented accumulation. Both are the main factors causing a long duration of economic expansion; thus, high credit growth will occur (boom), and in the end, it will accumulate a deep crisis (bust).

In terms of the duration of the formation of the credit cycle, it can be understood through the extent to which the cycle is formed in one period or unit, which in this case is known as frequency. The frequency of the cycle provides an understanding that the duration of any cycle moves in the period of expansion or vice versa in the period of contraction. It suggests that by knowing when a cycle is formed through the frequency indicator, an early warning indicator will be identified, which serves as a signal to provide information when a cycle enters a period of expansion, contraction, or even crisis period. In a booming economy, it leads to excess credit accumulation. During this boom, the size of the bank credit cycle increased. The size of this cycle is known as the amplitude of the cycle. Amplitude can be interpreted as the percentage change in the expansion condition towards the contraction condition or vice versa. The amplitude, in this case, is intended to illustrate the extent to which the expansion can lead to pressure or crisis on the financial or banking system.

Further, banking behavior that leads to speculative activities drives banking financing transactions further away from the real sector. This condition indicates that

banks need to concentrate fully on public financing to support businesses in the real sector. Moreover, banks are faced with the fact that the transactions that occur are only borrowing short and lending long, so in turn, this banking action results in errors in fund allocation, which leads to a high proportion of bad loans. This phenomenon will only occur in banks that use interest as a screening mechanism. It aligns with what was conveyed by Minsky (1982) that the current financial crisis has a cyclical nature that relies on business cycle theory. Financial market players, both financial institutions and investors, will behave aggressively in credit transactions when faced with an economic boom (expansion). They will take the opposite action when faced with an economic bust (contraction) so that in this condition, the market will be driven to high practice speculation in financial markets. An act of speculation that relies on a zero-sum game profit means that one party's gain is the other's loss. In this case, the economy is certainly not said to have experienced an increase or has not had a real impact on the economy.

Meanwhile, conventional finance/banking is based on a capital-based economy, which is only based on trading money and capital to finance investment. Thus, investment, in this case, is, of course, classified as debt accumulation-based investment; especially when faced with conditions of maintained inflation stability at the assumed level and low-interest rates, it will increasingly attract prospective borrowers to attract financing from conventional banking. In such conditions, it will be a land for speculative investors and Ponzi to reap profits that are not based on the real sector. The source of instability is stability itself (stability is destabilizing), which in turn will lead to a prolonged crisis (Minsky, 1982). The accumulation of excess debt is also at the root of the historical problem of crises that have hit the world. Moreover, credit bubbles that occur earlier and then encourage procyclicality of the economic activity cycle have become a common phenomenon in assessing the occurrence of crises (Claessens et al., 2011, 2013).

The procyclicality that carries systemic risk, which then drives the financial crisis, is housing bubbles and edit bubbles, as well as accumulation of foreign debt and volatility in foreign capital flows. An imbalance between the monetary sector and the real sector will lead to an economic bubble. In this case, one of the triggers is decoupling. Decoupling can be understood as a phenomenon of mismatch between the monetary sector and the real sector. This imbalance is caused by highly speculative transactions, where the economy in the financial sector is growing rapidly, but on the other hand, there is stagnation in the real sector. It should also be understood that the turnover of transactions in the real sector is limited by the ability of inputs to produce the output required by the market. It differs from the transaction cycle in the monetary sector, where there are no restrictions on transactions; every transaction that occurs is driven by the extent to which the perpetrators' ability and desire to get the maximum benefit. The fact that transaction patterns in the real and monetary sectors conclude that economic bubbles will continue to occur when the interest system is used as an absolute reference in public transaction activities.

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Likewise, it will happen to the banking sector in Indonesia, particularly in conventional banking. As the interest rate becomes the benchmark in transaction patterns, both in the form of credit extended to the business world, especially the real sector, and the money market. Both are the main sources of a bubble in the financial sector in Indonesia. Therefore, it can be interpreted that creating credit will create money, and this is the fault of conventional banking operations. It can even be said that conventional banking does not lend money but instead creates money.

CONCLUSION

This study demonstrates that the correlation between the financial and real sectors was procyclical. The procyclicality behavior in Islamic banks is less pronounced than in conventional banks, as evidenced by the smaller regression parameter. Furthermore, the data indicate that Islamic banks have a smaller amplitude than conventional banks during contraction or expansion. This finding implies that Islamic banks require longer than conventional banks to reach a perfect credit cycle frequency. Due to the financing cycle indicator in Islamic banks reflecting lower amplitude and higher frequency, these banks may not experience significant contraction during economic downturns. Meanwhile, conventional banks have a lower frequency of credit cycles than Islamic banks, meaning they are more likely to face a riskier position, resulting in a significant contraction and economic depression.

This study enhances the current literature on banking procyclicality in the dual banking system by examining the frequency and amplitude patterns during economic cycles. Given the current global financial instability is becoming more frequent, it is essential to consider the cyclical nature of banking behavior when examining its ability to withstand shocks. This involves analyzing the frequency and magnitude of fluctuations to ensure they remain within acceptable limits. Furthermore, the assessment of procyclicality behavior should be aligned with the appropriate thresholds to effectively prevent or mitigate excessive fluctuations in the cycles. The thresholds could serve as a surveillance tool for early detection of cyclical movement that can result in financial instability. Hence, the limitation arises by proposing the tolerated levels of shocks and risks to ensure procyclicality behavior is not creating bubbles and over-leverage. Considering that conventional banks exhibit greater procyclicality and tend to experience larger fluctuations, it is necessary for macroprudential policy to impose stricter regulations on conventional banks compared to Islamic banks. However, policy makers should also consider providing additional assistance for the growth of Islamic banks, as they contribute to the establishment of a less hazardous financial institution in the face of any financial turbulence.

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