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# Comparing Credit Procyclicality in Conventional and Islamic Rural Bank: Evidence from Indonesia

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**Abstract.** The procyclicality of loan expansion is one of several factors that have contributed to financial instability. Numerous empirical studies conducted in developed nations have demonstrated that financial crises always follow periods of excessive credit during economic booms. Since small and medium-sized businesses still dominate the economy in Indonesia, Islamic and conventional rural banks play a significant role in the provision of debt. This study compares conventional and Islamic rural banks in Indonesia, both of which are classified as pro-cyclical, in order to investigate the pro-cyclicality of the loan funneled through small and medium-sized enterprises. The procyclicality derived from rural bank indicator variables may have an impact on the real sector, and this study uses the Autoregressive Distributed Lag (ARDL) model and a frequency-based filter to construct the credit/financing cycle created by credit growth from both conventional and Islamic rural banks. The findings of this study suggest that both conventional and Islamic rural credit institutions do not closely track economic growth in the short run. Accordingly, procyclicality in Islam and the wider world does not behave in the short run. In contrast, conventional rural banks tend to be more procyclical than Islamic rural banks over the long term, particularly when the economy has expanded. Islamic rural banks exhibit countercyclical behavior in both the short and long terms compared to conventional banks from a capital perspective. Additionally, whereas Islamic rural banks are favorably impacted by credit risk, conventional rural banks have an adverse reaction to the rise in credit risk due to their bad loans. Finally, the outcomes of the frequency-based filter indicate that, in response to shifting economic situations, the cycles of credit provided by conventional rural banks and finance provided by Islamic rural banks are distinct.

**Keywords:** Bad Credit, Islamic Rural Bank, Procyclicality

## 1. Introduction

Since the Global Financial Crisis of 2018, economists' perspectives on crises—particularly those involving the interplay between the financial and real sectors of the economy—have undergone significant modifications. Post-crisis paradigms are now trying to change the premise on which pre-crisis analysis was based, arguing that recent crises were caused by the

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financial sector. This is in contrast to classical views, which state there is no significant correlation between both of them in the long run because the real sector depends greatly on factors of production.

A rapidly expanding body of literature seeks to determine whether the financial variables total credit, credit to GDP ratio, property price, and equity price could characterize the financial cycle, which has been used to analyze what primary variable may cause financial imbalances through its boom and bust. This new hypothesis was developed in response to the global financial crisis of 2018.

There have been more researchers who conduct studies focusing on the financial cycle in its correlation with crises, for example, research conducted by (Claessens et al., 2011; Marito et al., 2021; Zampieri et al., 2019) aims to analyze in detail the interactions between business and financial cycles since the recession in many developed and emerging market economies have been closely linked with financing distress that tends to be longer and deeper than other recessions. By measuring the credit-to-GDP ratio, which can lead to banking crises, (DeCarlo et al., 2022; Kim-Godwin et al., 2013; Trnka et al., 2021) attempt to both investigate the significant differences between the financial and business cycles in their amplitudes and frequencies. They also attempt to explain what the credit cycle actually is by using credit as the main variable.

By utilizing two analytical approaches called turning point analysis and frequency-based filters, (Chitimia-Dobler et al., 2021; Mandler & Scharnagl, 2022) are successful in their endeavor to characterize the financial cycle. In comparison to other studies, they use more variables in this one that potentially influences the financial cycle: credit, the credit-to-GDP ratio, property prices, equity prices, and an index of the price of all assets.

They discover four key findings, which are somewhat different from previous findings as they highlight broad aspects of what they refer to as the "financial cycle." One of these is that medium-term cycles of credit and property prices can accurately identify the financial cycle, while the other two variables (equity prices and aggregate asset prices) are unable to characterize the cycle because their volatility is higher than the others in short-term cycles. It might be argued that credit has been a significant factor in determining financial stability and that its lack may result in financial imbalances, including banking crises if it is not achieved.

Reforms in policy have been made in an effort to stop financial catastrophes as a result. The third Basel Committee on Banking Supervision (BCBS) has established policy in response to the global financial crisis of 2008, focusing primarily on financial security institutions through the power of capitalization and liquidity with its instrument: countercyclical capital buffer (CCB). Such a policy aims to give financial institutions the option to reduce losses suffered when a recession looms and is intended to limit the buildup of the risk that may be higher on the banking system as a result of excessive credit growth.

Particularly when credit growth is accompanied by economic growth or is referred to as pro-cyclical behavior, credit growth that significantly increases is likely to lead to the creation of a bubble economy. As a result, the impact might be dangerous for people who work in the financial markets if it goes unchecked. By raising the cost of credit transmission and causing banks to enhance capital reserves, the CCB policy is designed to promote credit growth during economic expansion.

The number of micro, small, and medium-sized firms (henceforth SMEs) in Indonesia, according to data from the Badan Pusat Statistik (BPS), has reached 57.9 million. This cannot be divorced from the function and support provided by banking in the distribution of credit. Rural banks, also known as Bank Perkreditan Rakyat (BPR), which provides both conventional and Islamic credit to SMEs, also provide this service.

Given that banking crises have been linked to credit growth at financial cycle peaks, it is crucial to examine potential boom and bust cycles, particularly those resulting from rural

bank credit, to determine whether they will exhibit pro-cyclical behavior. This information can be crucial for making policy decisions. The facts are outlined.This highlights the significance of additional study on the provision of loans to the private sector, similar to that conducted by both the BPR (Conventional Rural Bank) and BPRS (Islamic Rural Bank).

The entire credit distributed by BPR and BPRS is represented by the following information: In spite of the turmoil surrounding the global economy, the numbers above demonstrate an increase in credit or funding provided by BPR or BPRS. (Indrawati et al., 2021; Mutiah et al., 2023; Nurhajijah, n.d.; Utari, 2022) found a connection between Indonesia's loan expansion and the potential for procyclical behavior. Determining the procyclicality of loan growth on BPR and finance on BPRS is the goal of this study.

Additionally, in the case of Indonesia, credit has grown to be a significant policymaker concern when developing macroprudential measures to maintain financial stability. Credit was one of the several variables that (Alamsyah & Fuadati, 2021; Hardana et al., 2023; Nasser & Hardana, 2022) research used to successfully model the Indonesian financial cycle. It is crucial to investigate the procyclicality of credit growth in this particular sector of BPR and BPRS Indonesia. This study compares the credit procyclicality of Indonesian rural banks that are traditional and Islamic.

## 2. Literature Review

### 2.1 Credit Procyclicality

According to the economic dictionary, a business cycle is a variation in economic activity that is based on real GDP and alternates between peak and trough periods. According to the definition, there is an economic cycle or set of changes that alternately results in periods of rapid output growth and periods of output declines at their lowest points. Additionally, real GDP serves as the yardstick for determining how the economy fluctuates. Government involvement is, therefore, necessary to ensure economic stability.

Real GDP is the primary starting point for a business cycle analysis, according to (Mankiw, 2022), as it is the broadest indicator of all economic conditions. Because economic fluctuations are unpredictable, Mankiw places emphasis in this situation on stabilizing against shock policies that occur.

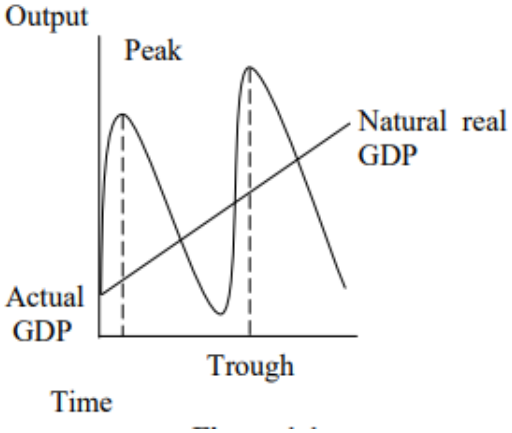


**Figure 1.** Business Cycle Curve

The design can be seen in the photo above. the economy fluctuates and moves well toward a peak or recession which is lowering till it reaches its lowest point in that cycle. The economic cycle has four stages:

a. The first is expansion, which results in more employment possibilities and higher employment wages as well as more consumption and company profits. If the economy is approaching its peak, growth is assured to be increasing. This growth is indicated by an increase in real GDP and is said to as expansion when it has occurred continuously for at least two consecutive quarters.
b. The second is the peak, when a nation's economy is operating at maximum capacity, but it will not persist due of a subsequent fall in return.
c. Recession is the third factor; when the economy weakens as a result of falling income, it will also affect consumers' purchasing power. People eventually become dependent on government assistance, such as social services, free commodities, etc., as a result of this. Mankiw claims that when the GDP declines for two consecutive quarters, a nation enters a recession.
d. The fourth condition is through, when a nation's economy is said to be in a state of apparent death. This occurs when there aren't enough job possibilities, which causes the pay rate and purchasing power to plummet. As a result, economic growth also falls. It can be claimed that a country will experience depression if its economy declines significantly and even reaches its lowest point.

### 2.2 Islamic Rural Bank (BPRS)

The external side of the Islamic Rural Bank (BPRS) has direct significance and is more sensitive to macroeconomic situations because it is a financial organization based on the real sector. The symptoms brought on by macroeconomic conditions are feared to have a detrimental impact on the performance of BPRS since they are macro factors that reflect the Indonesian economy. The BPRS finance will perform well when the macroeconomic performance is strong, and vice versa.

While all Islamic bank asset trends are encouraging, the Islamic Banking Development Report (LPPS) in 2018 indicates that the growth of Islamic bank assets has slowed in 2018. In line with Islamic Banking development Report (LPPS) in 2018, Islamic banks' assets have increased significantly. slowed down in 2018 even though Islamic banks' overall asset trends were strong. The slowdown in asset growth is a result of the state of the real sector, which includes factors like the continuation of the national economic crisis, the customer's diminished purchasing power as a result of high economic costs, and restrictions on corporate expansion and consumption. Since there are numerous Islamic rural banks operating in rural areas, the microfinance institution in this instance is an Islamic rural bank (BPRS).

Additionally, Islamic rural banks have a solid reputation in rural areas, making them a good business partner for both parties. Macroeconomic considerations and banking variables can help to support the growth of Islamic rural banks (Hardana et al., 2022; Prasetio & Widodo, 2022).

According to research by (Ashe & Egan, 2023; Borio & Gioia, 2021), the notion of a financial cycle can be summarized as the interaction between a person's perceptions of value and risk, their behavior when faced with risk, and their level of financial stability. The findings of Borio's study identify six key aspects of the financial cycle, which are as follows:

1) Property prices and credit are the closest indicators of the financial cycle;
2) The financial and commercial cycles occur at different frequencies;
3) The financial crisis is closely related to the financial cycle's apex;
4) It can identify potential financial difficulties early;
5) The current political environment has an impact on the length and amplitudo of financial cycles;
6) The overall financing of the economy is considered when determining the financial cycle.

(DeCarlo et al., 2022; Hardana, 2023) concentrate their research on the credit cycle, which has the potential to cause banking crises. They also try to distinguish between the credit cycle and the real economy cycle, while documenting the medium-term cycle and connecting the boom-and-bust credit cycle to banking crises. In this study, they use four different variables: real GDP growth, real bank loan growth, real bank asset growth, and real money aggregates. This study finds that, over the past century, an increase in credit growth has always been accompanied by an increase in the likelihood of banking crises by using the band-pass filter proposed by (Erten & Ocampo, 2021). Credit to GDP growth is found to have a strong relationship with financial crisis.

## 3. Research Method

In this study, quantitative techniques will be used, specifically Autoregressive Distributed Lag (ARDL), which requires quantitative time series data, and frequency-based filter to create cycles. Monthly time series secondary data from January 2022 to August 2019 will be gathered from a variety of sources, including Biro Pusat Statistik (BPS), Syariah Banking Statistics of Bank Indonesia (SPS-BI), and Banking Statistics of Bank Indonesia (SPI-BI), to provide the quantitative information required by both ARDL and frequency-based filter methods.

This study makes use of the Autoregressive Distributed Lag (ARDL) model, which Pesaran et al. Comparing this method to the EngleGranger test, Maximum likelihood test, or Johansen-cointegration test, it is relatively new, especially when discussing the cointegration between the variables in the interest of long-term study. Although the variables are at different levels of integration, such as I(0), I(1), or mutually cointegrated, this approach can still be used (Natsiopoulos & Tzeremes, 2022; Pesaran, 2021). This flexibility is the basic distinction between ARDL and other approaches. In contrast, other methods, such Johansen-Juselius cointegration, demand that all variables have the same degree of integration (Shrestha and Chowdhury, 2005).

Furthermore, ARDL approach is a model that is more statistically significantto determine the relationship cointegration relation for small samples, while Johansen cointegration models require large samples. Finally, in ARDL model it is possible that each variable can have the different optimal number of lags (Nattagh-Eshtivani et al., 2022). In addressing the different levels of integration between variables as described, (Natsiopoulos & Tzeremes, 2022; Siregar & Hardana, 2022) using the bound-testing procedure as co-integration test to estimate the long-term with the F test. The next step is to estimate coefficients of a long-term relationship, followed by short term estimates of all variables in the error correction format of ARDL model. ECM can be determined through the speed of adjustment towards equilibrium (Natsiopoulos & Tzeremes, 2022; Pesaran, 2021).

## 4. Results and Discussion

In the ARDL model, needs to be done F-statistic to test the null hypothesis which states that no cointegration can be described($H0 : \delta1 = \delta2 = \delta3 = \delta4 = \delta5 = 0$), while the alternative hypothesis (the existence of cointegration between variables) could be described($H0 : \delta1 \neq \delta2 \neq \delta3 \neq \delta4 \neq \delta5 \neq 0$). In this step, the F-statistic that has been tested to be compared with the critical value as proposed by Pesaran et al. (2001). This critical value has a lower limit (lower band) and the upper limit (upper band) which allows the classification based on level integration I(1), I(0), or the same level of integration.

Long-term estimates and estimates of short-term adjustment might then be performed after all variables had achieved cointegration. Additionally, the residual model underwent the

CUSUM and CUSUMQ tests in order to assess the stability of all models. The CUSUM test, which is based on the cumulative sum of recursive residuals, determines if an estimate is stable or unstable based on whether the CUSUM plot is at a crucial value of 5% (with the upper and lower limits not being out of line). The same holds true for the CUSUMQ test, which is based on the cumulative sum of squares of recursive residuals.

The F-statistic or bound test is needed to test the upper limit value critical level I(1) and a lower limit on the level I(0), and if the F-statistic is greater than the critical value, the null hypothesis (null hypothesis) that there is no cointegration is rejected. Meanwhile, if the F-statistic is less than the lower limit (lower bound), the null hypothesis can not be rejected, which means that H0is accepted (no cointegration). However, if the value is between lower and upper limits, the results are inconclusive. In this study, 8 (eight) is maximum lag of ARDL model both for conventional and Islamic monetary policy. Here are the results of bound test, in table below:

According to the aforementioned results of the bound test, the F-statistic for all conventional and Islamic models is higher than the upper limit (upper bound) critical value, even at the level of 1% for Islamic models or 5% for conventional models. In other words, H0, which states that there is no cointegration across variables, can be rejected in favor of H1, which states that there is cointegration among variables in the model, allowing for estimation of the long-run adjustment by error correction.

The estimated long-term and short-term adjustment (via ecm) is feasible after escaping perform bound testing. According to the Akaike Information Criterion (AIC), the ARDL models chosen for the traditional credit procyclicality model are (1, 0, 1, 0), while the ARDL models chosen for the Islamic model are (p, q) and (1, 0, 2, 1). To determine the short-term adjustment, it is required to evaluate both short- and long-term important indicators of error correction. The presence of cointegration between variables can be proved because Ecm was indicated negatively and highly significantly (level 1 percent).

Recursive estimation of the error correction model indicating the regression coefficient is generally stable throughout the period of study. The cumulative sum of squares plots based on recursive residuals, both conventional and Islamic models did not show statistically significant breaks; CUSUM plots are within the critical value of 5% as evidenced by the model's stability (see Appendix 1).

Ecm coefficients for traditional credit procyclicality models (-0.971) show that short-term errors will be corrected by 0.97 percent during the period (month) towards long-term equilibrium, whereas for the Islamic model (-0.859), they show that short-term errors will be corrected by 0.86 percent during one period towards equilibrium. Comparing the conventional rural bank model to the Islamic rural bank model reveals that the conventional rural bank model has a faster rate of adjustment toward long-term equilibrium. These are the outcomes of the ARDL model.

The output of the estimating model is displayed in Panel A. Economic growth (IPI), which demonstrated some intriguing outcomes among others, is not accompanied by an increase in lending in rural conventional banks. A statistical test indicated that it was not significant. This shows that the nature of loans is not procyclical in the short term, when an increase in credit growth is not always a result of economic expansion.

However, the results would appear very differently when looked at over the long run (panel B). Their loan has a long-term positive correlation with extremely big output growth and a very high coefficient of 1.98. Loan growth will occur in the long run even when economic growth in the short term is not directly related to loan growth. of other words, procyclicality characterizes the credit of traditional rural banks. The credit growth has a bigger amplitude when the coefficient is close to two (1.98). The current economic upswing could become unstable because of the procyclicality of loan growth, which poses a risk to the financial system (Utari et al., 2012; Pramono et al., 2015).

These findings are consistent with those of Craig et al. (2006), who attempted to objectively assess the procyclicality-causing factors in 11 Asian nations. Empirically, GDP growth has a huge impact that appears to cause credit procyclicality. This conclusion, that credit is procyclical because it tracks economic growth, is not only consistent with the situation in Korea as described by Jeong (2009), but it also shows that the magnitude of the effect can be reduced following the implementation of macroprudential policies like the Loan to Value (LTV) in Korea.

The short-term outcomes from the capital should then demonstrate how the credit reacts differently to increasing capital-to-assets in the BPR. In the past, an increase in the capital side would have resulted in a rise in credit growth, but in the present, an increase in the capital to asset ratio would have even reduced credit growth. On the other hand, over the long term, capital to asset demonstrates a positive correlation with credit growth. This indicates that even while the increase in credit is smaller than the influence brought on by economic expansion, it still raises when there is an increase in capital to assets.

Results are displayed in the funding model for Islamic rural banks.in contrast to research on traditional credit models, which is also highly intriguing. First, let's talk about how procyclical financial and economic growth are (lnFINcr and IPI). According to the estimation results, there is no procyclical behavior in financing over the short term, which means that a credit boom won't result from an increase in economic growth.

The same thing happens in the long term. Statistically, it showed no significant effect between financing and economic growth. So, in the long term even BPRS is still relatively safe or will not cause instability of financial systems due to exesscive financing. This finding contrasts with the behavior of credit at BPR which is highly procyclical.

Additionally, Islamic rural banks' variable capital to assets had distinct outcomes than conventional ones. A negative association between the short-term growth capital financing elements is evident from the estimation results, both in the immediate period and the lag (-2). That is, the BPRS's countercyclical capital buffer is acting in a way that supports financing expansion. This is consistent with the countercyclical capital buffer (CCB) strategy, which states that as capital requirements increase, the CAR can be successfully raised next to restrain the expansion of financing. Eventually, there won't be an excessive increase in credit growth. Since CAR also has a stronger negative coefficient over the long term than it does over the short term, it is likely to slow credit development over the long term when it is higher.

In order to create a common cycle, Christano-Fitzgerald (2003) used band-pass filters. As a result of frequency-based data filtering, Figure 4.1 shows that the amplitude of credit cycles in BPR decreased in the early part of 2009. This indicates that the credit penyaluaran BPR was negatively impacted by the 2008 global financial crisis, and the cycle will be in its lowest point until June 2009. Financial relationship crises that happen as a result of an increase in loans outstanding at a time of euphoria have already been studied by several economists, as widely reported by Kindleberger (2005) and Minsky (1970 & 2016).

Unlike what occurred in the BPRS, during the global financial crisis, 2009 financial crisis, the financing cycle amplitude reveals the distinction from the credit situation in BPR. In contrast to traditional lending, financing is therefore more resilient to the financial crisis. But the amplitude declines considerably from August 2013 to June 2014. This demonstrates that, subject to the state of the domestic real sector economy, the BPRS is quite resilient to the 2008 global financial crisis. The Indonesian economy was in a condition of sluggishness at the end of 2013, marked by high inflation of 8.38% and rising food price volatility. This is because fuel prices at the time were rising. Everything is in this state, which lowers purchasing power and makes financing growth slower.

## 5. Conclusion

By using ARDL models, it is possible to explain why the BPR exhibits procyclicality larger than that of the BPRS. This is supported by the fact that, in contrast to finance, BPRS credit growth has a significant impact on economic growth. In addition to the positive correlation between CAR and credit, the CAR on BPRS revealed the opposite result (negative), which is in line with the countercyclical capital buffer (CCB) strategy, which attempts to lessen procyclicality's behavior when the economy is expanding. While managing credit risk, BPR appeared to be more conservative than BPRS.

The conventional rural credit institutions are more susceptible to shocks brought on by the global financial crisis, according to the findings of filtering using a band-pass filter. It is seen by the amplitude, which sharply declines from peak to trough. The financial crisis is still able to endure shocks when it comes to BPRS financing, which is the opposite of the situation. However, financing BPRS is more sensitive to changes in economic circumstances estate sector seems amplitude diminished in the period beginning at the end of 2022, when the domestic economy is in a slump due to the decline in aggregate demand.

The recommendation from the following researcher is to take into account additional factors that can influence how resilient Rural Bank and Islamic Rural Bank are to economic crises. The non-financial factor may be added as another variable to examine each Bank's performance.

## References

Alamsyah, S. M., & Fuadati, S. R. (2021). Pengaruh ROE, CR, Dan DER Terhadap Harga Saham Pada Perusahaan Property and Real Estate Yang Terdaftar Di BEI Tahun 2015-2019. *Jurnal Ilmu Dan Riset Manajemen (JIRM)*, *10*(1).

Ashe, S., & Egan, P. (2023). Examining financial and business cycle interaction using cross recurrence plot analysis. *Finance Research Letters*, *51*, 103461.

Borio, D., & Gioia, C. (2021). GNSS interference mitigation: A measurement and position domain assessment. *Navigation: Journal of the Institute of Navigation*, *68*(1), 93–114.

Chitimia-Dobler, L., Lindau, A., Oehme, R., Bestehorn-Willmann, M., Antwerpen, M., Drehmann, M., Hierl, T., Mackenstedt, U., & Dobler, G. (2021). Tick-borne encephalitis vaccination protects from alimentary TBE infection: Results from an alimentary outbreak. *Microorganisms*, *9*(5), 889.

Claessens, M., De Meester, S., Van Landuyt, L., De Clerck, K., & Janssen, C. R. (2011). Occurrence and distribution of microplastics in marine sediments along the Belgian coast. *Marine Pollution Bulletin*, *62*(10), 2199–2204.

DeCarlo, K., Wallia, A., Kang, R. H., Cooper, A., Cherupally, M., Harris, S. A., Aikman, C., Liss, D. T., Ackermann, R. T., & O'Brien, M. J. (2022). Initiating second-line antidiabetic medication among older adults with type 2 diabetes on Metformin. *BMC Geriatrics*, *22*(1), 1–10.

Erten, B., & Ocampo, J. A. (2021). The future of commodity prices and the pandemic-driven global recession: Evidence from 150 years of data. *World Development*, *137*, 105164.

Hardana, A. (2023). Dampak Kehadiran Wisata Religi terhadap Penghasilan Pedagang Makanan di Lingkungan Masjid Agung Syahrun Nur Sipirok. *Jurnal Masharif Al-Syariah: Jurnal Ekonomi Dan Perbankan Syariah*, *7*(4).

Hardana, A., Sahri, M. Z., & Ramadhan, A. (2022). Comparative Analysis Of The

Profitability Of PT. Bank Panin Syariah Securities Before And After Going Public. *Journal of Islamic Financial Technology*, *1*(2).

Hardana, A., Utami, T. W., & Hasibuan, L. (2023). Accounting information in improving corporate values and responsibility to stakeholders in cement manufacturing companies in Indonesia. *Journal of Management Science (JMAS)*, *6*(2), 231–233.

Hardana, A., Utami, T. W., & Hasibuan, L. (2023). Accounting information in improving corporate values and responsibility to stakeholders in cement manufacturing companies in Indonesia. Journal of Management Science (JMAS), 6(2), 231–233.

Hasibuan, A. N., Hardana, A., Hasibuan, L., Utami, T. W., & Siregar, S. E. (2023). Penerapan Akuntansi Publik dalam Pertanggungjawaban Kinerja Instansi Pemerintah di Kantor Koperasi Usaha Kecil Kabupaten Mandailing Natal. Jurnal Simki Economic, 6(2), 288–295.

Indrawati, M., Utari, W., Prasetyo, I., Rusdiyanto, R., & Kalbuana, N. (2021). Household business strategy during the covid 19 paNDEMIC. Journal of Management Information and Decision Sciences, 24(1), 1–12.

Kim-Godwin, Y. S., Livsey, K. R., Ezzell, D., Highsmith, C., Winslow, H., & Aikman, A. N. (2013). Students like peer evaluation during home visit simulation experiences. *Clinical Simulation in Nursing*, *9*(11), e535–e542.

Mandler, M., & Scharnagl, M. (2022). Financial Cycles in Euro Area Economies: A Cross-Country Perspective Using Wavelet Analysis. *Oxford Bulletin of Economics and Statistics*, *84*(3), 569–593.

Mankiw, N. G. (2022). *Government debt and capital accumulation in an era of low interest rates*. National Bureau of Economic Research.

Marito, N., Nofinawati, N., & Hardana, A. (2021). Pengaruh Zakat Perbankan dan Corporate Social Responsibility terhadap Kinerja PT. Bank Muamalat Indonesia. *Journal of Islamic Social Finance Management*, *2*(2), 190–209.

Mutiah, N., Hardana, A., & Utami, T. W. (2023). Analysis of Batik Marketing Management in South Tapanuli Regency. *International Journal of Economic Research and Financial Accounting (IJERFA)*, *1*(3).

nasser NASSER, A., & Hardana, A. (2022). effect of operating costsonal operating income (bopo) and non-perfoming financing (npf) on return on assets (roa) in pt. bank rakyat indonesia syariah, Tbk For The Period 2009-2017. *Journal Of Sharia Banking*, *1*(2), 136–143.

Natsiopoulos, K., & Tzeremes, N. G. (2022). ARDL bounds test for cointegration: Replicating the Pesaran et al.(2001) results for the UK earnings equation using R. *Journal of Applied Econometrics*, *37*(5), 1079–1090.

Nattagh-Eshtivani, E., Pahlavani, N., Ranjbar, G., Gholizadeh Navashenaq, J., Salehi-Sahlabadi, A., Mahmudiono, T., Nader Shalaby, M., Jokar, M., Nematy, M., & Barghchi, H. (2022). Does propolis have any effect on rheumatoid arthritis? A review study. *Food Science & Nutrition*, *10*(4), 1003–1020.

Nurhajijah, A. H. (n.d.). *Islamic Finance And Economic Development*.

Pesaran, M. H. (2021). General diagnostic tests for cross-sectional dependence in panels. *Empirical Economics*, *60*(1), 13–50.

Prasetio, D. E., & Widodo, H. (2022). Ius Constituendum Pengujian Formil Dalam Perubahan Konstitusi. *AL-MANHAJ: Jurnal Hukum Dan Pranata Sosial Islam*, *4*(1), 1–12.

Siregar, B. G., & Hardana, H. A. (2022). *Metode Penelitian EKonomi dan Bisnis*. Merdeka Kreasi Group.

Trnka, S., Long, N. J., Aikman, P. J., Appleton, N. S., Davies, S. G., Deckert, A., Fehoko, E., Holroyd, E., Jivraj, N., & Laws, M. (2021). Negotiating risks and responsibilities during lockdown: Ethical reasoning and affective experience in Aotearoa New Zealand. *Journal of the Royal Society of New Zealand*, *51*(sup1), S55–S74.

Utari, D. (2022). Indonesia mixed contraception method skewness background 1997-2012: A mixed method study. *F1000Research*, *11*(1266), 1266.

Zampieri, F. G., Costa, E. L., Iwashyna, T. J., Carvalho, C. R. R., Damiani, L. P., Taniguchi, L. U., Amato, M. B. P., & Cavalcanti, A. B. (2019). Heterogeneous effects of alveolar recruitment in acute respiratory distress syndrome: a machine learning reanalysis of the Alveolar Recruitment for Acute Respiratory Distress Syndrome Trial. *British Journal of Anaesthesia*, *123*(1), 88–95. https://doi.org/10.1016/j.bja.2019.02.026