



Firm Value, Economic Shock, and Pitfalls of Approach Analysis: The Case of Indonesian State-Owned Bank

Faizal Reza ^{a++*} and Robby Prasetya Irawansyah ^{b#}

^a *Economics and Business Faculty, University of 17 Agustus 1945 Samarinda, Indonesia.*

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JEMT/2024/v30i11188

Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/111356>

Original Research Article

Received: 07/11/2023

Accepted: 10/01/2024

Published: 13/01/2024

ABSTRACT

Economic shocks are believed to have a major impact on economic stability. The purpose of this study was to determine and analyze the effect of Liquidity, Leverage, Profitability and the Covid-19 pandemic on the firm value of state-owned banks listed on the Indonesia Stock Exchange (IDX). The data used is the financial statement data of state-owned banks listed on IDX for the 2011-2021 period. The population of this study are state-owned bank companies listed on the Indonesia Stock Exchange. Sampling in this study was carried out using purposive sampling method. Based on predetermined criteria, 44 data were obtained. The data analysis used in this research are Multiple Linear Regression Analysis and Data Panel, then at the end of analysis is also strengthened by Structural Break Test and Panel Cointegration Test. The results from Data Panel showed that Liquidity has a negative and significant effect on Firm Value, meanwhile Leverage and Profitability has insignificant effect on Firm Value. Structural Break Test and Panel Cointegration Test both strongly showed there is an impact the Covid-19 pandemic on Firm Value.

⁺⁺ Lecturer;

[#] Student;

*Corresponding author: E-mail: rezafaizaluntagsmd@gmail.com;

Keywords: Firm value; leverage; liquidity; Covid-19; profitability; structural break test, panel cointegration test.

1. INTRODUCTION

The banking world is an industry engaged in finance and very close to people's daily lives. Banks must have stricter policies in order to have maximum impact on all of their functions, so that as financial traffic servants, banks carry out their duties based on the principle of prudence, because banks are expected not only to seek profit, but also to improve people's lives. In Indonesia, a state-owned bank is a financial institution that owned and operated by the government. Some of the banks that under the category of state-owned banks include PT Bank Negara Indonesia (Persero) Tbk (issuer code: BBNI), PT Bank Rakyat Indonesia (Persero) Tbk (issuer code: BBRI), PT Bank Tabungan Negara (Persero) Tbk (issuer code: BBTN), and PT Bank Mandiri (Persero) Tbk (issuer code: BMRI). These four banks play an important role in supporting financial stability and economic growth in Indonesia. Each bank has a different service focus, ranging from retail banking, corporate, SMEs to housing finance, each of which contributes to supporting various economic sectors in the country. Issuer codes are used to identify their shares in the Indonesian stock market, making it easier for investors to conduct capital market transactions and analysis. The banking industry can contribute more to the development of the country's economy, so banks must have good performance or a high level of health. Assessment of the bank's health condition can be done based on the bank's financial statements in previous periods.

Currently, the development and progress in the banking sector is very rapid, as evidenced by the large number of banks operating in Indonesia. The existence of high sophistication and complexity can trigger a risk that will result in a decrease in bank performance which leads to a decrease in public trust. There are several factors that affect the performance of a bank, namely external factors and internal bank factors, analysis of both internal and external factors on bank's performance should be carried out. The outcome of such analysis will help decision-makers in improving banks' performance by manipulating internal factors and by mitigating/capitalizing the influence of external factors [1]. Successful firms represent a key ingredient for developing nations. Many economists consider them similar to an engine in

determining their economic, social, and political development. To survive in a competitive business environment, every firm should operate in conditions of performance [2].

Stocks are regarded as the most common and actively traded securities in financial markets and are seen as a long-term source of funding. However, Investors tend to be risk-return focused and hence seek to mitigate the high risk associated with investing in stocks while maximizing expected returns by maintaining a preferred level of risk. Thus, conducting financial analysis about the performance of the companies, they are investing in realizing their investment objectives and basing their decisions [3]. In this study, the ratio of Firm Value that will be used is Tobin's Q. The Tobin's Q ratio is defined as the market value of a firm divided by the replacement cost of its assets. Tobin's Q ratio is assumed to represent a firm's investment or growth opportunities. If Tobin's Q does represent growth opportunities, there should be a positive relationship between the Tobin's Q ratio and future operating performance for a firm [4].

Meanwhile, when viewed from the factors that affect firm value, one of which is liquidity. Bianchi & Bigio, [5] their research discusses how monetary policy affects bank behavior in terms of lending and liquidity management, with real-world applications such as explaining interest rate pass-through and analyzing the 2008 financial crisis. They emphasis on liquidity frictions and interbank market dynamics shows the importance of these factors in the context of monetary policy implementation. Research conducted by Chou et al. [6] found that Liquidity has a significant negative effect on firm value. These results differ from research [7]. which states that Liquidity has no effect on firm value.

The next factor that affects firm value is Leverage. Leverage is strongly cyclical and this concept relates to the structure of capital and the business model of banking. Understanding of cyclical Leverage is important to financial reporting and bank management. In other words, Leverage relates to the credit supply and lending in banking and their returns of banks will depend on sensitively on Leverage positions [8]. Research conducted by Kramaric, [9] found that Leverage has a significant positive effect on Firm Value. This result is different from research [10]

which states that leverage has no effect on firm value.

In addition to Liquidity and Leverage, the growth rate of the firm's profit can be seen in the form of increased profitability, as well as measure and determine the financial performance of companies running operations, if the profitability achieved by the firm means higher stock returns, higher results [7]. Research conducted by Fatima & Shaik, [11] found that Profitability has a significant effect on Firm Value. These results differ from research [12] which states that Profitability has no effect on Firm Value. As we know at the end of 2019 the world is facing big problems. The emergence of a disease outbreak caused by the Covid-19 virus has caused almost all aspects of life to experience increasingly changes. The Covid-19 pandemic has proven to have put pressure on economic and social conditions in Indonesia since the end of 2019. This economic impact has a widespread impact across Indonesia and the banking sector with no exception. To avoid a worse impact than before, the Indonesian government immediately took aggressive steps so that the spread rate could be minimized as much as possible. Investors and markets are facing a high degree of uncertainty regarding both physical and financial impacts of virus. Research results on pandemic show a significant increase in total risk for the stock market [13]

Based on published financial reports, state-owned banks managed to book a net profit of IDR 72,369,497,000,000 in 2021. This figure jumped 78% compared to the previous year, which only reached IDR 40,656,764,000,000. In the first year of the Covid-19 pandemic, the profits of 4 state-owned banks fell from 47.50% to only IDR 40,656,764,000,000 in 2020 from the previous year of IDR 77,448,002,000,000. Due to the imposition of restrictions on community social activities, all lines of business were paralyzed, which had an impact on banking performance. Research by Igan et al. [14] highlighted the importance of financial stability and the need for macroprudential policies as a top priority, especially in the face of the global crisis including the Covid-19 pandemic. The results show that macroprudential policies are effective in reducing bank risk perceived by market investors during the pandemic. The results emphasize the need for careful calibration of future macroprudential regulations to prevent unintended consequences. Indonesia itself implements macroprudential policies in order to accelerate the recovery of the

economic impact of the Covid-19 pandemic. Meanwhile, research conducted by Maria et al. [15] shows that the Covid-19 pandemic has a negative and significant impact on bank stability in Indonesia, regardless of ownership (government or private) or size (large or small) of the bank. The findings reveal that no bank has avoided the decline in stability associated with an increase in the number of Covid-19 cases.

As a bank that dominates the banking sector in Indonesia, a State-Owned bank always be required to maintain its firm value. The value of the firm and the performance of State-Owned Enterprises commercial banks are very important when viewed from the strategic role it self. Conducting an analysis to determine the value of the bank's firm during shock economic period has always been something important and interesting, therefore this study will examine and focused how the impact of an economic shock, namely Covid-19 on the value of State-Owned bank in Indonesia. This study uses a sample of state-owned banks listed on the IDX during the period 2011-2021.

2. LITERATURE REVIEW

The agency theory is based on two behavioral assumptions. The first assumes that individuals seek to maximize their utility and the second presumes that individuals are likely to benefit from the incompleteness of contracts. Agency relationships are generally more complex and ambiguous (precisely in the sense that the agent is required to serve the interests of the principal) than contractual relations, especially when it comes to the question of ethics. If we stick to the classic version of the agency theory which states that the agent must always act in the interest of the principal, it is assumed that the interests of the principal are always morally acceptable, or that the agent must often act contrary to ethics in order to fulfill its "contract" in the agency relationship. These are positions that obviously do not comply with any workable model of business ethics [16].

Based on [10], if firm value is seen as book value, firms would be looking at increase in assets, earnings per share, dividend per share and book value of equity. If firm value is considered as market value, companies would be considering increase in market price of shares, price earnings ratio and market capitalization. Thus, firm value could be understood from the standpoint of increase in both book value and market value.

Meanwhile, the positive relationship between sustainability practices and firm value is stronger among firms with higher annual report readability. This illustrates the importance of transparency and clear reporting in amplifying the positive impact of sustainability practices [17]. Firm value and the role of corporate governance analysts are important because theoretically, corporate governance analysts create firm value through monitoring management, improving information production and dissemination, and increasing investor recognition [18].

And then, Liquidity can be explained as the ability of a firm to pay short-term obligations in a timely manner. Sufficient liquidity improves bank performance, reduces insolvency risk, and advances robustness and resiliency during intervals of stress [19]. Liquidity, in this context, can be defined as the total amount of capital and credit available in a system and used both in the real economy for production and services, and in the financial markets for investment in assets. It encompasses the entire availability of financial resources which includes money and credit injected into the economic system. It represents the overall balance between entities providing capital and credit in a financial ecosystem. Liquidity is therefore the basis for gross financing that supports economic activity, both through the circulation of capital for production and investment in financial markets to generate and manage assets. In other words, liquidity plays a crucial role in supporting smooth and sustainable economic activity and financial market growth [20].

Leverage is a comparison between the total value of liabilities and the total value of the firm's assets. Leverage described how the firm's assets are financed by debt compared to its own capital. Banks with smaller initial capitalization, higher uninsured leverage, and higher share of awake depositors are more susceptible to such runs and insolvency [21]. In that direction, financial leverage, as measured by the ratio of total debt to total assets (LEV), is a standardized control variable and indicator of financial risk size. Highly leveraged firms tend to have significant debt, making them riskier and triggering a higher cost of debt. However, it is important to consider financial constraints that may affect this relationship. For example, companies that cannot access debt financing may have low leverage, but that does not mean they do not have financial risks. Limited access to bank loans may result in a situation where companies with low leverage

still have significant risks. Therefore, in evaluating financial risk, it is necessary to consider not only the level of leverage, but also factors such as limited access to financing that may modify the relationship between leverage and the actual level of risk [22].

Bank profitability helps drive economic growth in the short run. Profitability is positively associated with greater economic growth. Considering the dynamics of bank profitability together with the impact of the short run dan the long run, it also finds a positive and significant impact of bank profitability [23]. The growth rate of the firm's profit can be seen in the form of increased profitability, as well as measure and determine the financial performance of companies running operations [7]. Meanwhile, the debt approach in a company can have a negative impact on profitability, in accordance with the principles of pecking order theory. This phenomenon suggests that firms prefer internal funding sources over external ones, and when taking on debt, the impact is detrimental to profitability. In addition, the concept of tangibility or linkage to physical assets also tends to lower earnings, forming a complex relationship between tangibility, earnings and debt. While a high level of debt can create a significant link to physical assets, it can lead to a decrease in profits due to interest expenses and debt repayments. Therefore, company management needs to carefully consider the capital structure and level of tangibility in making financial decisions to optimize profitability and maintain a balance between debt and physical assets. Overall, an in-depth understanding of the complexity of this interaction provides valuable guidance for firms in managing their finances effectively [24].

3. METHODS

3.1 Sample and Research Type

The research used in this study is quantitative research. This study uses a purposive sampling method, based on predetermined criteria, 4 samples of State-Owned Banks in Indonesia are obtained so that this study has 44 sample data. The sample was chosen because it met all the criteria determined by the research analysis needs. This study uses secondary data from the annual reports of Bank companies for the 2011-2021 period obtained from the official website of the Indonesia Stock Exchange and the websites of each firm.

Table 1. Definition of the dependent and independent variables

Variable Type	Variable	Measurement	Definition of variables
Dependent	Firm Value	Tobin's Q	MVE (Market Value of Equity) + Debt / Total Asset
Independent	Liquidity	Loan to Deposit Ratio	Amount of Loans Granted / Funds Received by the Bank
	Leverage	Debt to Equity Ratio	Total Debt / Equity
	Profitability	Return on Asset	Earnings After Tax / Total Assets
	Pandemic Covid-19	Dummy Variable	Before Covid-19 is scored 0, and During Covid-19 is scored 1.

Source: processed by researchers, 2023

The firm value uses the Tobin's Q. Tobin's Q is a measuring tool that defines firm value as a form of value of tangible assets and intangible assets. Firm value is proxied by MVE (Market Value of Equity) + Debt / Total Asset. For the Liquidity variable in this study using the Loan to Deposit Ratio (LDR). Liquidity measurement uses the Loan to Deposit Ratio, its measured with the amount of credit provided divided by the funds received by the bank. While the Leverage measurement in this study uses the Debt to Equity Ratio, that measured with total debt divided by equity. Another variable used in this study is Profitability which uses the Return on Asset (ROA), measured with profit after tax divided by total assets. To measure the economic shock represented by Covid-19. In this study we use categorical Dummy Variables as follows: Before Covid-19 is given a value score of 0, and during Covid-19 is given a score of 1.

3.2 Data Analysis Method

Several approaches that used in data analysis method in this research. First, we processed with Multiple Linear Regression. Then we also tried to use Panel Data Regression with Fixed Effect to get another view of the phenomenon we studied, to confirm whether the value of state-owned banks in Indonesia has indeed escaped the Covid-19 shock or not by conducting structural break testing with the Chow Test. Finally, to strengthen the structural break test, we also apply the Panel Data Cointegration Test to confirm whether the structural break has indeed had an impact on firm value. If cointegration is proven in the research model, then the hypothesis that there is a causal relationship between the research variables cannot be refuted. The Multiple Linear Regression with OLS used in this study is as follows:

$$Y_{it} = \alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 D_{it} + u_{it}$$

Where Y is Firm Value, β is variable Regression Coefficient, α is constant, X_1 is Liquidity, X_2 is Leverage, X_3 is Profitability. D is Covid-19 Dummy Variable (Before = 0, During = 1), and $u_{it} = \mu_i + v_{it}$. Since $E_{it} = p_i \neq 0$, then Least Square Dummy Variable was decided to be used in this study with the form of equation:

$$Y_{it} = \alpha + \sum_{j=2}^k \beta_j X_{jit} + \gamma_j Z_{jit} + v_{it}$$

Where Z_{it} is panel dummy variable and v_{it} is error term. This study used LSDV for Panel Data, because this study has limited small sample for state-owned bank. Chen, et al. [25] stated that based on Monte Carlo studies in finite sample properties they found both the t-statistic and the LSDV estimator have a small amount of bias.

4. RESULT AND DISCUSSION

The estimation results that the author did using Multiple Linear Regression can be seen in Table 2.

The results of testing the regression equation in Table 2 can be explained as follows:

$$\text{Firm Value} = 0.666893 - 0.296728X_1 - 0.002496X_2 + 4.844828X_3 - 0.024022D$$

From the model above, it can be interpreted that the value of β_1 Liquidity has a regression coefficient of -0.296728, this indicates that Liquidity has an unidirectional relationship to Firm Value, meaning that if the other independent variables are fixed and Liquidity increases by 1 unit, the Firm Value will decrease by 0.296728. The value of β_2 Leverage has a regression coefficient of -0.002496, this also shows that Leverage has an unidirectional relationship to the Firm Value, it means that if the other independent variables are fixed and

Leverage increases by 1 unit, the Firm Value will decrease by 0.002496. The value of β_3 Profitability has a regression coefficient of 4.844828, this indicates that if Profitability increases by 1 unit, the Firm Value will increase by 4.844828. β_4 the value of the Covid-19 Pandemic has a regression coefficient of -0.024022 but this effect not significant at any level on the Firm Value.

Simultaneous testing of Liquidity, Leverage, Profitability, and the Covid-19 Pandemic on Firm Value is concluded to have a simultaneous effect on Firm Value where the value of prob. F (Statistic) is smaller than the 5% significance level. Adjusted R squared in this study obtained a value of 0.508193 or it can be said that 50.8% of the variation in Firm Value can be explained by the independent variables, while the remaining 49.2% is influenced by other variables not included in the model. Partial testing of the effect of the Liquidity variable on Firm Value shows that Liquidity has an effect at a significance level of 10% where the Prob value $0.0656 < 0.1$ with a coefficient value of -0.296728. Leverage has no significant effect with a Prob value $0.5545 > 0.05$. Profitability variable has a significant positive effect with a Prob value $0.0148 < 0.05$ with a coefficient value of 4.844828. The Covid-19 pandemic has no significant effect with a Prob. t value of $0.4517 > 0.05$ with a negative direction.

Liquidity shows no effect on Firm Value. These results prove that Liquidity variable has a significant effect on Firm Value is not proven. This shows that increasing or decreasing bank liquidity has no impact on firm value. Liquidity is

the firm's ability to fund operations and pay off its short-term obligations and the Loan to Deposit Ratio is a comparison of loans provided with third party funds raised by banks. Investors are interested in companies that have a good level of liquidity, so the demand for the firm's shares increases which causes an increase in firm value. A good LDR is a sign that banks manage third party funds and credit channeled to the public well and that third party funds managed by banks are not idle, or on the other hand the credit channeled is also at a reasonable amount and does not exceed the amount of third party funds managed by banks. These results are supported by previous research conducted by Tui et al. [7] which states that Liquidity has no effect on firm value.

Leverage shows no effect on Firm Value. These results prove Leverage variable has a significant effect on Firm Value is rejected. This shows that increasing or decreasing bank Leverage has no impact on Firm Value. Leverage is a form of using a firm's debt to finance the firm's operational activities and the Debt to Equity Ratio is a comparison between total debt and total equity owned by the firm. Under certain conditions, it can be concluded that there is no effect of Leverage (DER) on Firm Value, this is because debt policy is an internal policy of the firm's management in developing its business and of course management will always try to find a low-cost source of funds that must be used, and there is a source of financing whether the high use of debt will not affect the stock price and firm value. These results are supported by previous research conducted by Etim et al. [10] which states that Leverage has no effect on firm value.

Table 2. Multiple linear regression analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.666893	0.084708	7.872821	0.0000
Liquidity	-0.296728	0.156483	-1.896232	0.0656
Leverage	-0.002496	0.004186	-0.596262	0.5545
Profitability	4.844828	1.897584	2.553155	0.0148
COVID-19 Pandemic	-0.024022	0.031593	-0.760381	0.4517
R-squared	0.555031	Mean dependent var		0.563244
Adjusted R-squared	0.508193	S.D. dependent var		0.064837
S.E. of regression	0.045470	Akaike info criterion		-3.234596
Sum squared resid	0.078565	Schwarz criterion		-3.029805
Log likelihood	74.54381	Hannan-Quinn criter.		-3.159076
F-statistic	11.84982	Durbin-Watson stat		2.236315
Prob(F-statistic)	0.000002			

Source: processed by researchers, 2023

Profitability shows a significant effect on Firm Value. These results shows that increasing bank profitability has an impact on firm value, increasing profitability value is followed by increasing firm value or high profitability can increase firm value and vice versa low profitability can reduce firm value. Profitability is a ratio to measure the firm's ability to generate profits by managing assets and Return on Assets is used to measure the bank's net profit obtained from the use of assets. Profitability (ROA) shows the level of net profit that can be achieved by the firm when carrying out its operations and then the profit that should be distributed to shareholders are profits after interest and taxes, so that with high profitability (ROA) it can provide added value to the firm which is reflected in its share price and the ability to generate profits. This will be responded positively by investors, one of which is reflected in an increase in stock prices. These results are supported by previous research conducted by Fatima & Shaik, [11] which states that profitability has a significant positive effect on firm value. Yudhyani et al. [26] using Structural Equation Modeling (SEM) also found that profitability indirectly affects firm value.

The Covid-19 pandemic shows no effect on Firm Value. These results shows that the Covid-19 pandemic has no impact on Firm Value. With the Multiple Linear Regression method, although we can already see a fairly clear direction (negative), the impact of the shock cannot be stated as having an effect on Firm Value. We suspect that banks in Indonesia can maintain their financial performance during the Covid-19 pandemic due to the support of stimulus and policy that issued by the Government of Indonesia together with the Financial Services Authority (OJK) which contains banks can provide credit or financing or other new provision of funds to debtors that affected by the spread of Covid-19 including micro, small and medium (MSME) business with a maximum financing value for each debtor of IDR 10,000,000,000 (ten billion rupiah). Regulation of Ministry of Finance states will be place funds in state-owned banks where the placement of state money in commercial banks is intended to accelerate national economic recovery which is part of state financial policy in the context of handling the Covid-19 pandemic. This result is supported by previous research conducted by Igan et al. [14] which states that the Covid-19 pandemic macroprudential policy has no effect on firm value.

4.1 A Brief Review with Panel Data Regression

In our research, we also consider using Fixed Effect Panel Data (LSDV) to confirm our initial findings regarding the impact of the Covid-19 shock on the Firm Value of state-owned banks in Indonesia during the Covid-19 pandemic. As we know, LSDV was chosen for several reasons: firstly, there may be bias in OLS so that this estimator is no longer consistent and efficient. Second, Panel Data has the capacity to provide a larger amount of data so that it is more informative which can result in a higher degree of freedom. its ability to combine information from time series and cross section data can help overcome the problem of omitted variables. Third, the use of Panel with Fixed Effect can control for individual differences in the research sample, even Fixed Effect with smoothing is very good for limited samples [27]. Panel estimation results are presented in Table 3 using the Fixed Effect Model. Panel Data equation that we obtained:

$$\text{Firm Value} = 1.332456 - 0.254388X_{1it} - 0.003580X_{2it} - 1.092542X_{3it} - 0.079576D_{it} + e_{it}$$

Regression Before Covid-19:

$$\begin{aligned} \text{Firm Value} &= 1.332456 - 0.254388 - 0.003580 - 1.092542 - 0.079576 \\ \text{Firm Value} &= 1.332456 - 0.254388 - 0.003580 - 1.092542 \end{aligned}$$

Regression During Covid-19:

$$\begin{aligned} \text{Firm Value} &= 1.332456 - 0.254388 - 0.003580 - 1.092542 - 0.079576 (1) \\ \text{Firm Value} &= (1.332456 - 0.079576) - 0.254388 - 0.003580 - 1.092542 \\ \text{Firm Value} &= 1.078068 - 0.254388 - 0.003580 - 1.092542 \end{aligned}$$

Panel Data Regression shows that the Covid-19 Pandemic has a negative effect on Firm Value. These results prove that the Covid-19 has no significant effect on Firm Value using Multiple Linear Regression is not fully acceptable. Our result shows that the Covid-19 pandemic has a significant negative impact on firm value, and this impact is significant at the 1% level. Although banks received stimulus support with policies issued by the Government of Indonesia together with the Financial Services Authority and the Ministry of Finance by placing funds in state-

owned banks in the context of handling the Covid-19 pandemic, in fact the presence of Covid-19 followed by a decrease in firm value is difficult to avoid, this makes it difficult for companies to increase profits and establish appropriate risk mitigation in maintaining the quality of stock performance during the pandemic. The significance of this variable clearly indicates that the demand for shares and stock prices have decreased, causing the firm's value to also decline. Fig. 1 is an illustration of the profitability of four state-owned banks that compactly show a downward trend during the Covid-19 pandemic.

Simultaneously, the effect of independent variables with Panel Data is concluded to be significant on Firm Value. The impact of Liquidity this time is also no different from the previous estimation where the coefficient is still negative and significant. Decreasing Liquidity causes a decrease in firm value, this is due to the decline in fund utilization and the high risk of Liquidity that is not in accordance with the normal threshold.

Then the impact of the Leverage variable on the Panel Data Regression is also consistent with the previous estimate which is not significant at any level of significance. A striking change

occurs in the Profitability variable which in this time have a negative sign but insignificant impact on firm value. The decline in profitability (Fig. 1) is a clear indication of why this variable is not significant in explaining Firm Value. The declining profitability experienced by state-owned bank companies because the companies (banks) are experiencing a direct impact due to low public consumption and investment due to the Covid-19 Pandemic. Quoting from the Ministry of Finance of Republic of Indonesia, in the second quarter of 2020, the Indonesian economy contracted (negative growth) by -5.3%. Indonesia's economic contraction is quite deep but relatively better than other countries including ASEAN countries such as Singapore. The decline in national economic performance was partly due to a decline in home consumption, investment spending and realization of government spending. Samples of some of the declining financial ratio performance of state-owned banks can be seen in Figs 2 and 3.

Figs. 2 and 3 show that two out of four state-owned banks have problems with their Liquidity and Leverage variables. To more understand what drives the impact of Covid-19 on the identified firm performance indicators, we

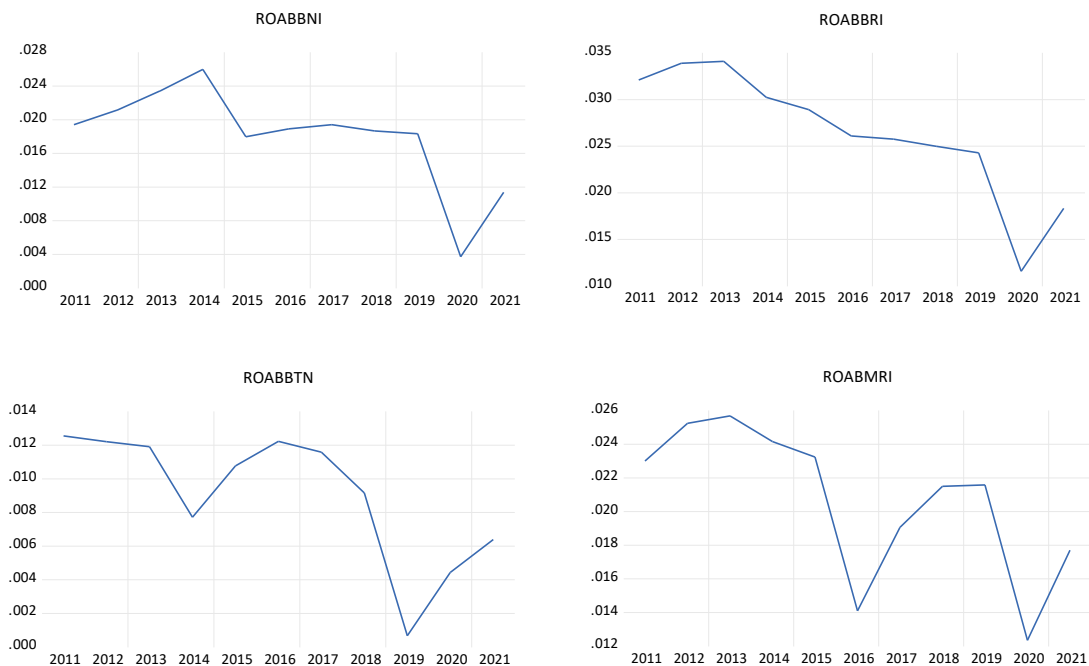


Fig. 1. Profitability Chart
 Source: processed by researchers, 2023

Table 3. Panel data regression-fixed effect model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.332456	0.121484	10.96815	0.0000
Liquidity	-0.254388	0.102741	-2.476009	0.0181
Leverage	0.003580	0.004390	0.815357	0.4202
Profitability	-1.092542	1.480320	-0.738044	0.4653
COVID-19 Pandemic	-0.079576	0.021295	-3.736874	0.0006
Fixed Effects (Cross)				
BBNI--C	-0.046764			
BBRI--C	0.102008			
BBTN--C	-0.081141			
BMRI--C	0.025898			
Root MSE	0.027560	R-squared		0.882320
Mean dependent var	1.098858	Adjusted R-squared		0.859438
S.D. dependent var	0.081269	S.E. of regression		0.030469
Akaike info criterion	-3.981239	Sum squared resid		0.033421
Schwarz criterion	-3.656841	Log likelihood		95.58726
Hannan-Quinn criter.	-3.860937	F-statistic		38.55935
Durbin-Watson stat	2.431880	Prob(F-statistic)		0.000000

Source: processed by researchers, 2023

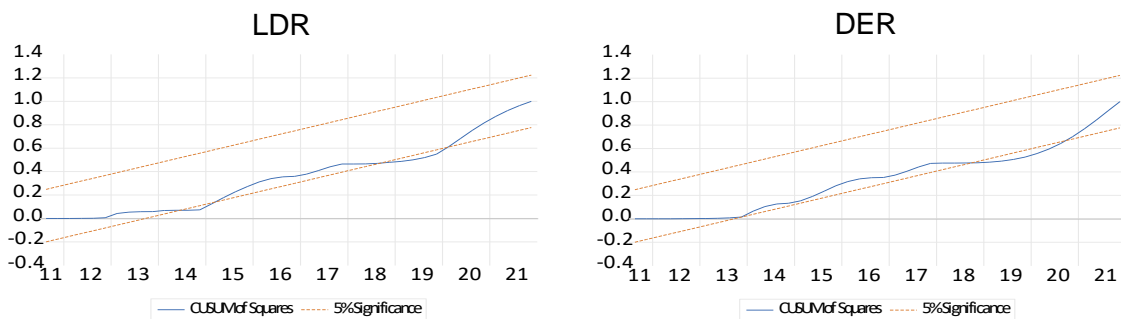


Fig. 2. Stability test for LDR and DER BBNI

Source: processed by researchers, 2023

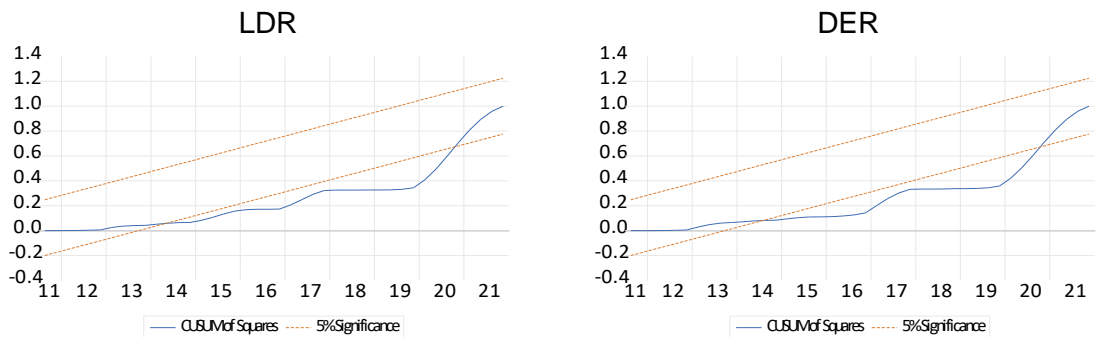


Fig. 3. Stability test for LDR and DER BMRI

Source: processed by researchers, 2023

use the Structural Break Test as a tool to corroborate the view of a shock on our samples, the comparative figure on the Structural Break Test shows an interesting pattern. The shock due to Covid-19 seen as the data when we break its with interpolation in quarterly form. It appears

that the Firm Value decreases as the percentage of Covid-19 increases which occurred in 2020 quarter 2. To get this pattern, we not only use the Profitability variable but also use all financial performance ratios in 2020 to capture the impact of Covid-19. This report can be seen in Table 4.

Table 4. Chow Breakpoint Test

Chow Breakpoint Test: 2020Q2 for	Prob.		
	LDR	DER	ROA
BBNI	0.0000*	0.0001*	0.0421*
BBRI	0.1217	0.2252	0.2704
BBTN	0.0014*	0.8526	0.5448
BMRI	0.0000*	0.0000*	0.0003*

* Indicate significance $P < 0.05$

Table 4 shows the Chow Breakpoint Test on the entire sample using bank financial performance variables. The results show that the shock in the second quarter of 2020 had a significant impact on several banks. Two of four state-owned banks we studied consistently showed significant Structural Break Test values on all bank performance variables. Thus, it can be stated that 50% of our sample is significantly affected by the Covid-19 pandemic. From four state-owned banks, only one of our samples passes the Structural Break Test on all of its variables, namely Bank BRI, while the rest show mixed results on its performance variables. This result provides two important perspectives. First, that different anticipatory measures and responses among banks may determine different outcomes of the shock impact on each bank. Second, we suspect that banks that are unable to pass the Structural Break Test are actually banks with market shares (both in terms of assets, deposits, and lending) that are quite large and risky to the economy. To corroborate this initial conjecture, we will check with several other steps, namely by checking the correlation between the research variables and finally with the Panel Cointegration

Test of Pedroni [28,29] and Kao, [30]. If the null hypothesis of the cointegration test is rejected then we can unequivocally state that there is a correlation of two or more non-stationary time series in a specific period.

Table 5 illustrates the correlation between independent variables and the dependent variable Firm Value. It appears that the correlation between the Covid-19 shock and firm value can be said weak with a value of -0.254. Again, the negative sign indicates that the movement of firm value is opposite to the occurrence of Covid-19. Similarly, the correlation between profitability and Covid-19 variables is negative. The destabilization of LDR and DER in Figs 2 and 3 is also reinforced in the negative correlation to Firm Value. However, sometimes there is an opinion that using linear regression sometimes produces false correlations due to the impact of other factors. Moreover, the weak correlation between Covid-19 and Firm Value seems not satisfactory enough to show the existence of structural break. Therefore, to prove it, we will apply the Panel Cointegration Test to see if there is a decisive co-trend combination

Table 5. Descriptive Statistics Variables

Variable	Mean	S.D	Min	Max	Obs.
Firm Value	1.098858	0.081269	0.981967	1.249210	44
LDR	0.892089	0.095099	0.707032	1.134980	44
DER	7.841724	2.797761	4.751109	17.07140	44
ROA	0.018546	0.008190	0.000671	0.034102	44
Covid-19	0.181818	0.390154	0.000000	1.000000	44
Correlation Coefficients					
Variable	Firm Value	LDR	DER	ROA	COVID-19
Firm Value	1.000000				
LDR	-0.554053	1.000000			
DER	-0.529625	0.516609	1.000000		
ROA	0.794677	-0.572653	-0.596574	1.000000	
Covid-19	-0.254012	-0.180893	0.195617	-0.454639	1.000000
Other Statistic					
Skewness	0.232725	0.479079	1.666912	-0.129504	1.649916
Kurtosis	1.871185	2.905778	5.469556	2.379433	3.722222
Jarque Bera	2.733257	1.699399	31.55734	0.829011	20.91924

Source: processed by researchers, 2023

among our research variables in the long run. In the short run, the implication of this cointegration is that the variables in this study should not deviate much from their parameter means.

Before we include the Covid-19 shock in the equation, we first conduct a Panel Cointegration Test on the research model without the structural break variable. We did This step to see the natural behavior of bank performance variables without the Covid-19 disturbance. Table 6 is the result of the Panel Cointegration Test without the Covid-19 shock variable. It can be seen that of the seven Panel Cointegration parameters with the method [28,29] is dominated by the decision to accept the null hypothesis of no cointegration in the research variables. However, this result is opposite to the method of Kao, [30] which states that there is cointegration with a prob. value smaller than 0.05.

The Panel Cointegration Test without structural break variables shows that without Covid-19 variables, our hypothesis regarding the impact of Covid-19 is still not clear enough. Then, to confirm the effect of Covid-19, we then include the Covid-19 shock variable into the Panel

Cointegration Test equation. The test results by including the shock variable with both Pedroni [28,29] and Kao, [30] methods are shown in Table 7.

Now, table 7 shows clear and consistent results where we can conclude that there is cointegration in most of the Panel Cointegration Tests using both Pedroni [28,29] and Kao [30] methods. The cointegration shown in Table 7 strongly supports the results of the previous Chow Structural Break Test that there is an indication of the impact of Covid-19 on our time series. One important finding with the Panel Cointegration Test is that after the Covid-19 variable is included in the equation, the shock effect appears clearly. This result confirms that there is a decisive co-trend combination after the presence of Covid-19 variable. Finally, we can firmly conclude that there is a real impact of Covid-19 on the firm value of state-owned banks based on Panel Data estimation. The existence of the Covid-19 shock has an impact on the declining firm value. At the end of 2019, these four banks' lending market share accounted for 43.3% of all Indonesian banking sector loans. These state-owned banks are also lenders to

Table 6. Panel Cointegration without Structural Break Covid-19

Pedroni Cointegration Test (Within Dimension)						
	Individual Intercept		Individual Intercept and Trend		No Intercept and Trend	
	Prob.	Conc.	Prob.	Conc.	Prob.	Conc.
Panel v-Statistic	(-0.3037)	Accept H0	(-1.3778)	Accept H0	(-0.8631)	Accept H0
	0.6193		0.9159		0.806	
Panel rho-Statistic	(0.0569)	Accept H0	1.2831	Accept H0	(-0.3272)	Accept H0
	0.5227		0.9003		0.3717	
Panel PP-Statistic	(-3.4083)	Reject H0	(-2.8916)	Reject H0	(-3.5192)	Reject H0
	0.0003		0.0019		0.0002	
Panel ADF-Statistic	(-1.1391)	Accept H0	(-0.6622)	Accept H0	(-2.2641)	Accept H0
	0.1273		0.2539		0.0118	
Pedroni Cointegration Test (Between Dimension)						
	Prob.	Conc.	Prob.	Conc.	Prob.	Conc.
Group rho-Statistic	0.6702	Accept H0	2.1434	Accept H0	0.5761	Accept H0
	0.7486		0.984		0.7178	
Group PP-Statistic	(-5.5041)	Reject H0	(-6.1273)	Reject H0	(-4.8982)	Reject H0
	0.0000		0.0000		0.0000	
Group ADF-Statistic	(-0.9388)	Accept H0	(-1.0352)	Accept H0	(-2.6828)	Reject H0
	0.1739		0.1503		0.0036	
Kao Cointegration Test						
	Prob	Conc.				
ADF	(-1.8444)	Reject H0				
	0.0326					

Source: processed by researchers, 2023, the t-Statistic expressed in parentheses

Table 7. Panel Cointegration with Structural Break Covid-19

Pedroni Cointegration Test (Within Dimension)						
	Individual Intercept		Individual Intercept and Trend		No Intercept and Trend	
	Prob.	Conc.	Prob.	Conc.	Prob.	Conc.
Panel v-Statistic	(-1.0518)	Accept H0	(-1.9165)	Accept H0	(-1.5279)	Accept H0
	0.8536		0.9724		0.9367	
Panel rho-Statistic	(1.13)	Accept H0	(1.7534)	Accept H0	(0.4267)	Accept H0
	0.8708		0.9602		0.6652	
Panel PP-Statistic	(-11.1776)	Reject H0	(-13.7213)	Reject H0	(-4.3505)	Reject H0
	0.0000		0.0000		0.0000	
Panel ADF-Statistic	-2.8667	Reject H0	(-4.8268)	Reject H0	(-2.1636)	Reject H0
	0.0021		0.0000		0.0152	
Pedroni Cointegration Test (Between Dimension)						
	Prob.	Conc.	Prob.	Conc.	Prob.	Conc.
Group rho-Statistic	(2.0551)	Accept H0	(2.5698)	Accept H0	(1.4592)	Accept H0
	0.9801		0.9949		0.9278	
Group PP-Statistic	(-13.3175)	Reject H0	(-15.2505)	Reject H0	(-5.1997)	Reject H0
	0.0000		0.0000		0.0000	
Group ADF-Statistic	(-3.1654)	Reject H0	(-4.4726)	Reject H0	(-2.0782)	Reject H0
	0.0008		0.0000		0.0188	
Kao Cointegration Test						
	Prob	Conc.				
ADF	(-3.3352)	Reject H0				
	0.0004					

Source: processed by researchers, 2023, *t*-Statistic expressed in parentheses

the corporate sector with credit growth above the national banking industry. However, the downfall of corporate sector during Covid-19 eventually had derivative impact on this group of banks. Outstanding third party funds and loans during Covid-19 in this group of banks were smaller than other banks. Net profit fell from 47.7% to 45.6% in the second quarter of 2020, credit suffered similarly as these banks had very little funds to allocate. We also suspect that the shock felt by most state-owned banks but has no impact on the only bank that passed this test – bank BRI – because almost most of the portion of credit disbursed by BRI, around 80.62%, are targeted at the Micro, Small Medium Enterprise (MSME) sector which tends to be more able to survive the Covid-19 shock than other business sectors. It seems that the market share of MSME loans reaching 70.66% is quite capable of securing the BRI's performance from the shock of the Covid-19 pandemic compared to other banks.

5. CONCLUSION

In general, our results from using two different approaches yield identical findings around the impact of internal factors (performance of

financial variables) on firm value. We find that firm value is directly impacted by internal factors (performance) and economic shock from Covid-19. Specifically in this study, we try to show two important things: first, how different analytical approaches can produce different findings specifically around the impact of economic shocks on firm value. Multiple Linear Regression can explain how to forecast causal relationships thoroughly and robustly if all assumptions are met. But at the same time, the vulnerability of OLS also affects the prediction accuracy.

Panel Data using Fixed Effects (at least) in this study is more capable of capturing how the impact of the concept of economic shocks on firm value more accurately. First, With the advantage of capturing differences in individual characteristics, Panel Data is expected to provide more complete information for researchers which is not obtained in analyzing cross section data or time series data separately. Secondly, a detailed Structural Break Test and Panel Cointegration Test are conducted to ensure that there are indications of shocks in our panel data set. All tests that measure the strength of the estimates simultaneously show the same strong results where there is a real

impact of Covid-19 on Firm Value. Finally, we may agree on the influence of internal factors on the value of a firm, but the accuracy of the impact on paper may differ depending on how we choose the analytical instrument.

6. RESEARCH LIMITATIONS

The limitation of this study is that the sample studied is limited to state-owned banks only. We suggest for future research to enlarge the sample using all conventional banks or Islamic banks that go public and using a more complex approach to strengthen the conclusions.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Fani KA, Khan VJ, Kumar B, Pk BK. Impact of internal and external factors on Bank Performance in Pakistan. *International and public affairs*. 2018;2(4): 66-77.
2. Taouab O, Issor Z. Firm performance: Definition and Measurement Models. *European Scientific Journal*, 2019;15(1): 93-106.
3. Mehrotra AA. Exploring the relationship between the financial ratios and the share price: Evidence from Bahrain Listed Financial Institutions. *Arab Economic and Business Journal*, 2022;14(2):150-165.
4. Fu L, Singhal R, Parkash M. Tobin's q Ratio and Firm Performance. *International Research Journal of Applied Finance*. 2016;7(4):1-10.
5. Bianchi J, Bigio S. Banks, Liquidity Management, and Monetary Policy. *Econometrica*. 2022;90(1):391-454.
6. Chou HI, et al. Dark Trading and Firm Value; 2022. Available: https://ssrn.com/sol3/papers.cfm?abstract_id=4156291
7. Tui S, Mahfud N, Mukhlis S, Andi N. Determinants of Profitability and Firm Value: Evidence From Indonesian Banks. *IRA-International Journal of Management and Social Sciences*. 2017;7(1).
8. Shahchera M. Identification of cyclical banks in Iranian banking system (Focus on Leverage Ratio). *Iranian Economic Review*. 2020;24(1):247-266.
9. Kramaric TP. Performance of Slovenian Listed Firms during COVID-19 Out-Break. *International Journal of Economic Sciences*. 2023;12(1):163-177.
10. Etim EO, Umoffong NJ, Enang ER, Agatevure G. Liquidity management and firm value of quoted manufacturing companies in Nigeria. *Indo-Asian Journal of Finance and Accounting*, 2022;3(1):47-66.
11. Fatima N, Shaik AR. The nexus between capital structure and firm value by profitability moderation: Evidence from Saudi Arabia. *The Journal of Asian Finance, Economics and Business (JAFEB)*, 2022;9(9):181-189.
12. Mohammed ZO, Al Ani MK. The Effect of Intangible Assets, Financial Performance and financial policies on the firm value: Evidence from Omani Industrial Sector. *Contemporary Economics*. 2020;379-391.
13. Baek S, Mohanty SK, Glambosky M. COVID-19 and stock market volatility: An Industry Level Analysis. *Finance Research Letters*. 2020;37:101748.
14. Igan D, Mirzaei A, Moore T. Does Macprudential Policy Alleviate The Adverse Impact of Covid-19 on The Resilience of Banks?. *Journal of Banking & Finance*, 2023;147:106419.
15. Maria S, Yudaruddin R, Azizil Yudaruddin Y. The impact of Covid-19 on bank stability: Do Bank Size And Ownership Matter?. *Banks and Bank Systems*. 2022;17(2):124-137.
16. Zogning F. Agency theory: A critical review. *European Journal of Business and Management*, 2017 9(2):1-8.
17. Phang SY, Adrian C, Garg M, Pham AV, Truong C. COVID-19 Pandemic Resilience: An analysis of firm valuation and disclosure of sustainability practices of listed firms. *Managerial Auditing Journal*. 2023;38(1):85-128.
18. Huang P, Lu Y, Wee M. Corporate governance analysts and firm value: Australian evidence. *Pacific-Basin Finance Journal*. 2020 63:101430.
19. Sidhu AV, Rastogi S, Gupte R, Bhimavarapu VM. Impact of liquidity coverage ratio on performance of select Indian banks. *Journal of Risk and Financial Management*. 2022;15(5), 226.
20. Luque Raya IM, Luque Raya P. Machine learning algorithms applied to the estimation of liquidity: the 10-year United States treasury bond. *European Journal*

- of Management and Business Economics; 2023.
21. Jiang EX, Matvos G, Piskorski T, Seru A. Monetary tightening and US Bank fragility in 2023: Mark-to-Market Losses and Uninsured Depositor Runs? (No. w31048). National Bureau of Economic Research; 2023.
 22. Kling G, Volz U, Murinde V, Ayas S. The Impact of Climate Vulnerability on Firms Cost of Capital and Access to Finance. World Development. 2021;137:105131.
 23. Klein PO, Weill L. Bank profitability and economic growth. The Quarterly Review of Economics and Finance. 2022;84:183-199.
 24. Nazir A, Azam M, Khalid MU. Debt financing and firm performance: Empirical evidence from the Pakistan Stock Exchange. Asian Journal of Accounting Research. 2021;6(3):324-334.
 25. Chen B, Suzanne KM, Chihwa K. Estimation and Inference of a Cointegrated Regression in Panel Data: A Monte Carlo Study, American Journal of Mathematical and Management Sciences. 1999;19:1-2:75-114.
 26. Yudhyani E, Kulsum U, Reza F, Sitorus AN, Kirana NWI. Determinant factors of firm value: Cash Holdings and Dividend Policy as Mediation. JASF. 2022;5(2): 278-301.
 27. Halder SC, Emir M. Corrigendum to smoothed LSDV estimation of functional-coefficient panel data model with two way fixed effect. Economics Letters. 2021; 192.
 28. Pedroni P. Critical values for cointegration tests in heterogeneous panels with multiple regressors. Oxford Bulletin of Economics and Statistics. 1999;61:653-670.
 29. Pedroni P. Panel cointegration, Asymptotic and finite sample properties of pooled time series tests with an application to the PPP Hypothesis. Econometric Theory. 2004;20:597-625.
 30. Kao C. Spurious regression and residual-based tests for cointegration in panel data, Journal of Econometrics. 1999;90:144.

© 2024 Reza and Irawansyah; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

The peer review history for this paper can be accessed here:
<https://www.sdiarticle5.com/review-history/111356>