

Financial Ratios and Stock Volatility: Empirical Evidence from the Banking Sector

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Abstract: *Banking stock price volatility is closely related to company performance and fundamental indicators. This study analyzes the short-term and long-term relationships between financial ratios and stock price volatility in the banking sector. Based on the results of the long-term correlation, the Price to Earnings Ratio (P/E) and Dividend Yield (DY) variables are proven to be dominant factors influencing volatility because they are directly related to stock price movements. In the short-term correlation between state-owned banks, there is an inverse relationship between Price to Book and ROE, and Debt to Equity has a significant negative effect on Return on Assets and Dividend Yield, indicating that the debt structure compress profitability and dividend payment capacity. Meanwhile, in private banks, Price to Earnings and Price to Book have a significant negative effect on Debt to Equity, suggests that firms perceived by the market as more profitable and valuable tend to maintain lower leverage levels. In general, in both state-owned and private banks, financial ratios reflect fundamental conditions that influence capital structure, investor expectations, and stock price volatility in the short and long term.*

Keyword: *Stock Price Volatility, Financial Performance, Market Valuation.*

Background

Stock market volatility is strongly linked to corporate performance. In economic situations, corporations are required to be able to adapt to macroeconomic and political changes in order to meet company targets to boost company profitability. Through ratio analysis, financial parameters can reveal the effectiveness of a company's corporate governance. Good financial performance includes reduced company risk, increased revenue, steady profitability, increased productivity, and increased market share. Furthermore, a stable economy can lower stock price volatility.

Companies with high financial performance meet requirements such as increasing revenue, consistent earnings, and balanced financial ratios. Consistently expanding revenue will enable the company to enhance its capability to allocate capital by increasing assets, allowing it to pay debts more quickly. Furthermore, organizations with high performance have relatively steady profits, which improves the firm's ability to raise capital from investors and better withstand market and economic shocks. Furthermore, market sentiment

based on concerns about corporate performance or economic circumstances might have an impact on stock prices. Credit risk, liquidity risk, and operational risk are all examples of business risks that affect stock price volatility.

Extreme stock price volatility has a negative impact on firm performance by raising the expense of capital, limiting the company's access to money, thus increasing the risk of failure. High volatility in stock markets can raise the expenditure of capital because investors demand higher returns as a replacement for greater risks. Furthermore, significant stock price volatility decreases the company's capacity to acquire cash as investors turn more selective in their investment decisions. Unusual stock price volatility heightens the risk of company failure, since firms facing financial distress are generally more vulnerable to sharp price movements.

Banking, as an intermediary in the finance sector, requires good governance and the ability to determine, evaluate, and manage risks effectively. Several of the qualities of healthy banking include excellent durability with healthy financial ratios. It also requires high transparency and accountability.

Research on the relationship between corporate performance indicators in financial reports and volatility in stock markets is an intriguing issue to discuss. The objective of this study are to Examine the short-term and long-term relationships between key financial ratios and stock price volatility in the banking sector, Identify the financial ratios have the most significant influence on stock volatility, Provide insights about financial ratios can be used as indicators of market confidence.

Literature review

Financial statements are documents that offer firm information over a set period of time. Financial statements are also utilized for evaluating the organization's performance and making investment decisions. Financial ratios analysis is a technique used to assess the financial health of a business. Ratio analysis has emerged as an effective method for monitoring, assessing, and improving organizational performance (Adedeji, 2014). According to studies, there is a strong link among ratio analysis and performance of organizations (Adedeji, 2014) Financial ratios should be regularly analyzed to identify a company's potential, strengths, weaknesses, and challenges in achieving profitability (Adedeji, 2014). According to Dada and Ghazali (2016), capital structure and corporate performance are closely related, as companies typically finance their operations through both equity and debt (Dada & Ghazali, 2016).

Ratio analysis is used to assess the company's current financial situation, past financial performance, and weaknesses as well as strengths (Saigeetha & Surulivel, 2024). Financial ratio analysis includes the ratios of liquidity ratio, ratio of profitability, efficiency ratio, solvency ratio, and growth ratio. Ratio analysis can be performed by comparing the outcomes of a business's financial results to through ratio analysis according to trendlines, as well as comparing performance amongst companies in the same commodities sector industry to determine how much the company controls a particular sector.

According to Saigeetha & Surulivel (2024), the general objective of ratio financial analysis is to: 1) establish both short- and long-

range planning strategies. 2). Identify and evaluate the company's financial performance, 3) observe financial performance patterns, 4) make operational and investment decisions, 5) determine financial issues and operational problems and diagnose them, and 6) provide insightful information into the company's portray or financial position. Financial ratio estimation is useful for forecasting a company's potential and successes. First, financial ratios can help management develop strategies for investing and potential business planning policy approaches (Husna & Desiyanti, 2016). Second, the study of financial ratios is used to assess the company's internal situations in order to develop financial allocation and debt strategies (Husna & Desiyanti, 2016).

Banking is an industry of services that provides credit and funding to a variety of economic sectors. Banking financial reports include both assets and liabilities. Liabilities are an important source of bank finance (Tadija & Novi, 2013). Cash flow reports provide information on input and outflow funding throughout a specific company period. Cash flow reports include cash flows from operational, investment, and financial operations. Financial statement analysis assesses or evaluates a company's previous performance by examining sales patterns, spending, earnings revenue, and return on investment. Analysis of the existing position will also reveal what assets the company has as well as what liabilities are required to repaid (Harsha Vardhan, 2017). According to Tadija & Novi, (2013) financial analysis plays a vital role in assessing the performance of the banking sector. The study emphasized that key indicators of financial success include liquidity and solvency ratios, profitability and efficiency measures, capital expenditure indicators, and revenue-based return ratios.

The hypothesis of an efficient market (EMH) is classified into three forms: weak, semi-strong, and strong (Fama, 1970). In the weak form of the EMH, a company's stock price only reflects historical data such as price and volume. In the form known as semi-strong, the information set includes both previous and publicly available data, such as the balance sheets. In the EMH's robust version, current stock prices represent any information, especially

private information. In therefore, market participants can get all pertinent information (Fama, 1970).

Short-term solvency measurement reflects the relationship between current assets, current liabilities, and the cash flows generated from a firm's operations. Rumondang Sinaga et al., (2023), examined the influence of Return on Assets (ROA), Return on Equity (ROE), and Debt to Equity Ratio (DER) on stock prices in Indonesia. The study found that Return on Assets positively affects stock prices, indicating that higher returns attract investors and drive stock value upward. Zhofiroh & M, Si., (2023), conducted a study examining the impact of profitability, liquidity, and market value ratios on stock prices. Their findings show that profitability, measured by Return on Assets (ROA), and liquidity have no significant effect, while the market value ratio, represented by Dividend Yield, has a substantial influence on stock prices. Similarly, Fahriyana & Puspitarini, (2023), analyzed the effects of liquidity, solvency, profitability, and market ratios on stock prices. Their study revealed that solvency and profitability ratios did not significantly affect stock prices, whereas the market ratio, particularly Earnings per Share (EPS), had a strong impact. In another study, Maryani & Zakaria, (2020), investigated the effects of ROA, ROE, and DER on the stock prices of companies listed on the Jakarta Islamic Index. The results indicated that ROA and DER had no significant influence, while ROE showed a positive and significant effect on stock prices.

Method

Research on the analysis of financial ratio indicators in the company's financial statements against stock price volatility using the Return on Asset (ROA), Return on Equity (ROE), Price to Earnings Ratio (P/E), Dividend Payout Ratio, and Debt to Equity Ratio indicators. Data obtained from Time Series Data on Bloomberg from 2010 to 2023. The independent variables are ROA, ROE, P/E, and DER, representing profitability, efficiency, and leverage indicators. The dependent variable is Stock Price Volatility.

The analysis technique used in measuring the relationship between financial

ratio indicator analysis in the company's financial statements and stock price volatility uses the Vector Error Correction Model (VECM) Method by first testing the stationarity of the variables used. The analysis technique consists of: 1). Testing the stationarity conditions of the variables using the Augmented Dickey Fuller (ADF) Test, 2). Lag Length Determination, 3). Testing cointegration with Johansen Test, 5). Vector Error Correction Model (VECM) Estimation Vector Error Correction Model (VECM) Estimation. The study sample consists of banks categorized into two groups: non-private (government-owned) banks and private banks. To maintain confidentiality, banks were assigned anonymized codes. Non-private banks were coded as NP-01, while private banks were coded as PR-01.

Stationerity test

The stationarity data test uses Augmented Dickey-Fuller (ADF) to see if the time series data has a unit root test in the model. The ADF stationarity test can be seen as follows:

$$ADF = \frac{\phi - 1}{SE(\phi)}$$

Hipotesis:

$H_0: \phi = 1$ (there is a root unit/not stationary)

$H_0: \phi \neq 1$ (there is no root/stationary)

Assuming H_0 is rejected, then the data is stationary. If the calculated ADF test statistic value is less than the ADF Critical Value table value of 5% or the ADF probability value is smaller than the residual value in the output. If H_0 is rejected, then the data is stationary.

Vector Error Correction Model (VECM)

This study employs the Vector Error Correction Model (VECM) to investigate the short- and long-term correlations between non-stationary yet cointegrated variables. VECM is an adaptation based on the VAR (Vector Autoregression) method for historical data with cointegration, representing short-term dynamics through initial differences while considering long-term equilibrium via the error correction term (ECT) factor. The analysis begins with an Augmented Dickey-Fuller (ADF) stationarity test to guarantee that any variables are integrated in first order (I(1)). The Johansen cointegration test

is then used to determine whether there are any long-term links between variables. If cointegration is discovered, the VECM is computed for determining the short-term consequences and the trajectory of the adjustment toward long-term equilibrium. This model has been selected because it can provide a full view of how economic variables interact dynamically over time. In general, the *Vector Error Correction Model* (VECM) model can be formulated as follows:

$$\Delta Y_t = \alpha (Y_{t-1} + \beta X_{t-1}) + \sum_{i=1}^{P-1} \gamma_i \Delta Y_{t-1} + \sum_{i=1}^{P-1} \delta \Delta X_{t-1} + \varepsilon_t$$

Where:

- x_{t-1} = a vector of size $n \times 1$ containing n variables in a VECM model
- $(Y_{t-1} + \beta X_{t-1})$ = The ECT represents the long-run relationship between variables. If there is a deviation from long-run equilibrium, the ECT will detect and correct it.
- α = error correction coefficient (how quickly it returns to long-run equilibrium)
- $\sum_{i=1}^{P-1} \gamma_i \Delta Y_{t-1} + \sum_{i=1}^{P-1} \delta \Delta X_{t-1}$ = short-term relationship between variables. This coefficient describes how changes in X and Y in the past affect current Y .
- e_t = residual vector

Table 1. Variables and description

Variable	Description
Volatilitas Stock Price	Stock price volatility is a measure used to measure how much a stock price changes over a certain period of time. The method used is Standard deviation, which measures how much the stock price changes from the average stock price.
Return on Asset (ROA)	Return on Asset measures a company's ability to generate profits from its assets. ROA is calculated by dividing net income by total assets. A high ROA indicates that the company has a good ability to generate profits from its assets.
Return on Equity (ROE)	Return on Equity measures a company's ability to generate profits from its equity. ROE is calculated by dividing net income by equity. The higher the ROE, the better the company's performance in generating profits.
Debt to Equity Ratio	measures a company's debt level relative to its equity. DER can help investors and financial analysts understand a company's capital structure and associated financial risks. A low Debt to Equity Ratio (DER) indicates that a company has a relatively low level of debt compared to its equity, reflecting strong financial stability and a good ability to meet its obligations. It also suggests that the company adopts a conservative financial policy and is less aggressive in using debt to boost profitability.
Price to Earnings Ratio (P/E),	measures a company's stock price compared to its earnings per share. This ratio is often used by investors to assess whether a company's stock price is too high or too low. Indicates that the company's stock price is relatively high compared to its earnings per share.
Divident Payout Ratio	Dividend Payout Ratio measures the percentage of net income that is distributed as dividends to shareholders. A high DPR indicates that the company is paying large dividends to shareholders.
Price to Book	The Price to Book (P/B) Ratio is a financial metric used to compare a company's current market price to its book value. It helps investors assess whether a stock is overvalued or undervalued relative to the net assets the company holds.

Finding and discussion

Cointegration testing using the Johansen Test method (Table 2) to see the long-term relationship between the variables analyzed. Based on the research Johansen Test results, it was found that for State-Owned Banks (NP-01), The T-statistic value of 172.77, which exceeds the critical value of 124.24, leads to the rejection of the null hypothesis (H_0), indicating the existence of a long-term cointegration relationship among the analyzed variables. Similarly, for Private Banks (PR-01), the T-statistic value of 168.5 was also higher than the critical value of 124.24, confirming the existence of long-term cointegration between financial ratios and stock price volatility.

Furthermore, the Eigen values at lag 0 were recorded as being larger than those at previous lags. This indicates that a significant cointegration vector occurred at that lag, in line

with the theory that stock price volatility is strongly influenced by conditions and movements in the previous period. Overall, the finding that the T-statistic value exceeded the critical value strengthens the indication of long-term cointegration between financial ratios and stock price volatility in the capital market.

The analysis also shows that financial ratios that influence stock price volatility reflect a company's fundamental condition, such as Profitability, Solvency, and Growth ratio. Good financial ratios indicate a company with good governance and stable performance, thus increasing investor confidence and leading to more stable stock prices with lower volatility. Conversely, financial ratios that indicate weak company performance reflect uncertainty and potential market speculation. This tends to increase stock price volatility, as investors respond to higher risk and uncertainty.

Table 2. Johansen test cointegration

Sample	Maximum Rank (lag)	Log Likelihood	Eigen Value	T-Statistic	Critical Value (5%)
Government Bank					
NP-01	0	-866.36	0	172.77	124.24
	1	-843.04	0.56	126.13	94.15
	2	-820.52	0.55	81.08	68.52
NP-02	0	-760.51	0	150.46	124.24
	1	-737.49	0.560	104.42	94.15
	2	-718.15	0.498	65.742	68.52
Private Bank					
PR-01	0	-577.03	0	168.5	124.24
	1	-545.5	0.675	105.44	94.15
	2	-528.59	0.45	71.62	68.52

Long-term correlation relationship between financial ratio and stock volatility

Based on the Root Mean Square Error (RMSE) analysis presented in Table 2, this metric serves as a vital indicator to evaluate the model's predictive accuracy. RMSE calculates the difference between the predicted values generated by the model and the actual observed values. A smaller RMSE value indicates that the model's predictions are closer to the real data, thus demonstrating better performance. In addition to RMSE, the R-squared value is also

crucial as it measures how much variation in the dependent variable can be explained by the independent variables. A higher R-squared value demonstrates that the independent variables can better account for the fluctuations in the dependent variable. Furthermore, the Chi-square Probability value provides insights into the significance of the model. When the Chi-square Probability value is below 0.05, it implies that the independent variables significantly influence the dependent variable. Overall, the combination of RMSE, R-squared, and Chi-square Probability

values provides comprehensive insights into model accuracy and explanatory power.

For State-Owned Banks categorized as NP-01, the analysis indicates that Return on Assets (ROA), Return on Equity (ROE), Price to Earnings (P/E) Ratio, Dividend Yield, and Debt to Equity Ratio collectively influence long-term stock price volatility. Among these factors, the long-term cointegration test highlights that the P/E Ratio and Dividend Yield exhibit the most significant effects on stock price volatility, surpassing the impacts of ROA and ROE. In contrast, for State-Owned Banks categorized as NP-02, the findings highlight the stronger influence of Debt-to-Equity Ratio (DER) and P/E Ratio, compared to ROA and ROE. The DER structure affects long-term stock price volatility because it directly reflects a bank's risk profile, financial performance, and market expectations. A higher DER can indicate an aggressive growth strategy where leverage is used to accelerate expansion, which, while potentially profitable, also increases exposure to market fluctuations and risk.

Similarly, in the case of Private Bank 01, the Price to Earnings Ratio and Dividend Yield are observed to have a more prominent and statistically significant impact on stock price volatility compared to ROA and ROE. This is because P/E Ratio and Dividend Yield are derived directly from stock market movements, making them highly sensitive to changes in stock prices. Consequently, any fluctuation in stock prices is immediately reflected in these metrics. According to Salsabila et al. (2024), an increase in Dividend Yield generally leads to higher stock price volatility, while a decrease in Dividend Yield corresponds with lower volatility. Supporting this view, Harnanti and Nurdiana (2025) also confirm that dividend policies significantly affect stock price volatility. Additionally, Osundina et al. (2016) find that Book Value per Share, which is closely related to the Price-to-Book Ratio, has a significant positive effect on stock price volatility. Similarly, Wanda (2022) reports that the Market-to-Book Ratio, which reflects the same fundamental concept, also has a positive and substantial influence on stock price volatility.

Table 2. Financial ratio and stock volatility (Root Mean Square Error)

	Equation	RMSE	R-sq	Chi2	P>Chi2
NP-01	ROA_NP01	0.201	0.307	20.826	0.0134***
	ROE_NP01	1.430	0.317	21.853	0.0094***
	PE_NP01	8.116	0.568	61.817	0***
	DY_NP01	0.705	0.378	28.569	0.0008***
	DE_NP01	8.405	0.279	18.171	0.0332***
	PB_NP01	0.165	0.214	12.823	0.171
NP-02	ROA_NP02	0.152232	0.2993	20.07547	0.0175***
	ROE_NP02	1.30659	0.298	20.03499	0.0177***
	PE_NP02	1.8961	0.3415	24.37324	0.0037***
	DY_NP02	0.83532	0.0741	3.763285	0.9263
	DE_NP02	7.9426	0.4082	32.41814	0.0002***
	PB_NP02	0.251524	0.1534	8.515469	0.4831
PR-01	ROA_PR01	0.069005	0.475	42.52677	0***
	ROE_PR01	0.766914	0.2161	12.95617	0.1646
	PE_PR01	1.75462	0.1735	9.866449	0.3614
	DY_PR01	0.17882	0.0889	4.58326	0.869
	DE_PR01	3.27714	0.594	68.77666	0***
	PB_PR01	0.302484	0.1645	9.254877	0.4141

Note: *significant at 10%, **significant at 5%, ***significant at 1%

Short-term correlation relationship between independent variables and dependent variables state-owned banks (NP-01)

Based on the results of short-term analysis (Table 3) between independent variables and dependent variables in State-Owned Bank (NP-01) that between Price to Book and Return on Equity has a short-term reciprocal relationship because Price to Book reflects market expectations of the company's performance in the future, so that the increase in the value of Price To Book will help the company access new capital at a better price, with the increase in new capital the company can make investments that increase profitability thereby increasing the value of Return on Equity. While the increased ROE value will increase the

attractiveness of the company resulting in an increase in the value of Price to Book.

Based on the results of the study that Price to Book significantly negatively affects Debt to Equity however Debt to Equity does not affect Price to Book. This is because an increase in the Price to Book ratio indicates that the market values the company above its net asset value, enabling the firm to attract more equity investment and reduce reliance on debt, thereby lowering its Debt-to-Equity ratio. Similarly, Debt to Equity significantly negatively affects Dividend Yield. A high Debt to Equity value indicates that the use of debt is greater than equity, thus affecting the company's ability to pay dividends.

Table 3. Short-term relationship between independent and dependent variables NP-01

x	P NP-01	ROA NP-01	ROE NP-01	PE NP-01	DY NP-01	DE NP-01	PB NP-01
P NP-01 (t-1)	-0.07104	0.0000746	0.0009701	0.0061912***	-0.0003	0.0049719*	4.26E-05
ROA NP-01	-471.555	-0.1255397	0.7802145	-16.987	-0.05956	-2.08927	-0.26742
ROE NP-01	186.6802	-0.0001529	0.0037442	2.764025	-0.1558	2.576112	0.0926664***
PE NP-01	-2.69172	-0.0036286	-0.0169827	-0.2266698**	-0.00712	0.001526	0.000889
DY NP-01	-57.8213	-0.0165	-0.3363527	1.900056	0.184739	-3.38033	-0.00409
DE NP-01	-6.5653	0.0038191	0.0298734	-0.09683	-0.0199776*	-0.2758884*	-0.0032
PB NP-01	48.01164	-0.1845953	-3.23372***	0.783395	0.316207	-21.1549***	-0.13592

Note: *significant at 10%, **significant at 5%, ***significant at 1%

State-Owned Banks (NP-02)

Based on the short-term analysis (Table 4) of State-Owned Banks (NP-02), the Debt-to-Equity Ratio has a significant negative effect on Return on Assets, but not vice versa. This finding can be explained through the nature of how debt impacts a company's operations and profitability. The Debt-to-Equity Ratio reflects the extent to which a company is financed by debt relative to its equity. A higher ratio indicates that the company relies more heavily on debt. This debt brings interest obligations that directly affect net income. Since Return on Assets (ROA) is calculated based on net income relative to total assets, any increase in interest expense reduces the net income available to be attributed to the assets, thereby lowering ROA. In addition, a higher debt level increases financial risk exposure, which can negatively influence investor perception and operational flexibility, further reducing the efficiency of asset returns. Conversely, the analysis shows that Return on Assets does not significantly influence the Debt-

to-Equity Ratio because ROA is an outcome measure that reflects how effectively assets are generating profit under existing financial structures. Decisions regarding debt levels are primarily determined by corporate governance policies, strategic financing choices, and external market conditions, rather than by short-term performance outcomes.

Similarly, the relationship between Return on Assets (ROA) and Return on Equity (ROE) shows that ROA has a significant positive effect on ROE, whereas the reverse relationship is not significant. ROA represents how efficiently a bank's assets are used to generate profit, while ROE measures profitability from the perspective of shareholders. When ROA improves, it indicates that the company's assets are producing higher earnings. This increase in net income naturally raises ROE because Return on Equity is calculated as net income divided by shareholders' equity. Therefore, better asset utilization leads to higher returns for shareholders. On the other hand, the analysis reveals that ROE does not have

a significant direct effect on ROA. This is due to the fact that ROE can increase as a result of higher financial leverage (i.e., more debt relative to equity), which boosts returns to shareholders without necessarily improving the efficiency of asset utilization. In other words, a bank can report a high ROE due to increased leverage, but its assets may not be performing more efficiently, leaving ROA relatively unchanged.

The analysis also shows that Dividend Yield has a significant positive effect on the Price to Earnings (P/E) Ratio, but the reverse relationship is not significant. Dividend Yield reflects the annual dividend paid per share relative to the stock price, serving as a key indicator of the return investors receive from dividends alone. A higher Dividend Yield is often

interpreted by the market as a sign of financial stability and a commitment to shareholder returns. This positive perception can increase investor demand, thereby pushing the Price to Earnings Ratio higher as the market anticipates steady or improving profitability in the future. In contrast, the Price to Earnings Ratio does not significantly influence Dividend Yield because P/E is shaped by a wide range of factors, including market sentiment, growth expectations, risk appetite, and overall economic conditions. While dividend policies can influence P/E to some extent, the ratio is not solely determined by dividend yield, making the reverse effect statistically insignificant in this short-term analysis.

Table 4. Short-Term Relationship between Independent and Dependent Variables NP-02

x	P _{NP-02}	ROA NP-02	ROE NP-02	PE NP-02	DY NP-02	DE NP-02	PB NP-02
P _{NP-02}	-0.42254	-0.0000137	0.0000581	0.001144	-0.00023	-0.00347	6.59E-05
ROA NP-02	1133.862***	0.2556326	4.340984**	-0.98609	0.824035	10.93479	0.348526
ROE NP-02	-93.7619	0.0171008	-0.0720873	-0.46784	0.042394	0.327806	-0.02463
PE NP-02	17.21422	-0.0098139	-0.1294672	0.015	0.012647	0.347488	0.001328
DY NP-02	42.85812	-0.0614739	-0.7588595**	1.008353***	-0.22009	-3.44849	-0.00571
DE NP-02	-17.64251*	-0.005455**	-0.0038791	-0.02224	0.011935	0.134531	-0.00068
PB NP-02	303.7568	-0.0174886	-0.213876	0.187508	-0.0612	3.537932	-0.16262

Note: *significant at 10%, **significant at 5%, ***significant at 1%

Private Banks (PV-01)

The short-term analysis (Table 5) of the relationship between the independent variables and the dependent variable Private Banks (PV-01) reveals that Price to Earning, Dividend Yield, and Price to Book have a significant negative effect on the Debt-to-Equity ratio. This negative correlation occurs because when these indicators rise, they indicate that the bank is performing well in terms of profitability, market valuation, and shareholder returns, reflecting strong cash flow

and robust financial health. Higher earnings and a favourable price-to-book position suggest that the institution can generate sufficient internal funds to support its operational and expansion needs without relying heavily on external debt. Similarly, an attractive dividend yield demonstrates financial stability and the ability to distribute returns to shareholders while maintaining growth, which further signals reduced dependence on borrowing.

Table 5. Short-Term Relationship between Independent and Dependent Variables PV-01

x	P _{PV-01}	ROA PV-01	ROE PV-01	PE PV-01	DY PV-01	DE PV-01	PB PV-01
P _{PV-01}	-0.29633	-5.32E-06	0.0003566	0.000484	-0.00011	0.003593	0.0001
ROA PV-01	565.7165	0.3432892***	1.993861	-4.85932	0.050077	-11.168***	-0.40328
ROE PV-01	-51.9086	0.012228	-0.2105656	0.176001	0.011014	1.219918	0.025345
PE PV-01	-73.3445	-0.0060641	-0.183522	-0.27375	0.029688	-2.23400***	-0.04437
DY PV-01	-230.221	-0.0259885	-0.878357	-1.563	0.163013	-10.4533***	-0.34179
DE PV-01	11.562	-0.0058229**	0.0265161	-0.00539	-0.00118	0.2827747**	0.000838
PB PV-01	194.8537	0.0796271	0.9851209	-0.98023	-0.02995	7.814848**	-0.16967

Note: *significant at 10%, **significant at 5%, ***significant at 1%

Conclusion

The conclusion of this study highlights a significant long-term relationship between financial ratios and stock price volatility in both State-Owned Banks and Private Banks. The research demonstrates that specific financial ratios serve as key indicators of stock price movements and investor expectations. In the long-term analysis, the Price to Earnings Ratio (P/E) and Dividend Yield (DY) emerged as the dominant factors influencing stock price volatility. These ratios are directly related to stock price movements, reflecting market perceptions of profitability and the company's capacity to distribute returns to investors.

For the short-term correlation analysis, distinct patterns were observed between the two banking types. In State-Owned Banks, a reciprocal relationship was identified between Price to Book and Return on Equity (ROE). Furthermore, the study found that Debt to Equity (D/E) has a significant negative impact on both Return on Assets (ROA) and Dividend Yield. This indicates that a higher debt structure can reduce a bank's profitability and its ability to distribute dividends, suggesting that leveraging too much debt may suppress financial performance in the short term.

In contrast, Private Banks displayed different short-term dynamics. The variables Price to Earnings Ratio and Price to Book Ratio were found to negatively impact the Debt-to-Equity Ratio. This suggests that positive market perceptions of a bank's financial performance encourage the use of equity financing over debt, reducing the institution's reliance on borrowing. Additionally, a high Dividend Yield was shown to indicate strong cash flows, which also lowers the Debt-to-Equity Ratio as companies choose to utilize internal resources rather than external debt. Interestingly, the study concludes that in Private Banks, Debt to Equity does not have a significant effect on Dividend Yield, as dividend policies are influenced more by profitability and internal strategic decisions than the debt level.

Overall, the study confirms that in both State-Owned and Private Banks, financial ratios are a strong reflection of fundamental conditions. They have a notable impact on capital structure decisions, shape investor expectations, and

influence stock price volatility in both the short and long term. These findings underline the critical role of financial ratio analysis for stakeholders in understanding the stability and market behavior of banking institutions.

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