

Digital Finance and Bank Stock Valuation: The Role of Cryptocurrency and Profitability in Indonesian KBMI 3 and KBMI 4 Banks

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Abstract

This study aims to examine the effect of cryptocurrency and profitability on stock prices of KBMI 3 and KBMI 4 banks listed on the Indonesia Stock Exchange during the 2021–2023 period. This research employs a quantitative explanatory approach using secondary data obtained from annual reports of listed banks, stock market data, and cryptocurrency market data. The sample consists of ten KBMI 3 and KBMI 4 banks selected through purposive sampling, resulting in 60 observations. Data were analyzed using multiple linear regression supported by descriptive statistics and classical assumption tests. The findings reveal that cryptocurrency does not have a significant effect on stock prices, indicating that fluctuations in digital asset markets have not yet become a primary determinant of banking stock valuation in Indonesia. In contrast, profitability has a positive and significant effect on stock prices, suggesting that investors continue to rely heavily on firms' financial performance as the main basis for investment decisions. Furthermore, cryptocurrency and profitability jointly have a significant influence on stock prices, demonstrating that both external market dynamics and internal corporate performance contribute to stock price formation. These findings reinforce Signaling Theory by emphasizing the importance of profitability as a positive signal to investors while extending Arbitrage Pricing Theory by illustrating that the influence of cryptocurrency is context-dependent and varies across industries. This study contributes to the growing literature on digital finance by providing empirical evidence from the Indonesian banking sector and offers practical insights for investors, banking management, and regulators in responding to financial digitalization and the evolving cryptocurrency ecosystem.

Keywords: Cryptocurrency, profitability, stock price, KBMI banks, signaling theory, arbitrage pricing theory, Indonesia.

Abstrak

Penelitian ini bertujuan untuk menganalisis pengaruh cryptocurrency dan profitabilitas terhadap harga saham pada bank KBMI 3 dan KBMI 4 yang terdaftar di Bursa Efek Indonesia selama periode 2021–2023. Penelitian ini menggunakan pendekatan kuantitatif eksplanatori dengan memanfaatkan data sekunder yang diperoleh dari laporan tahunan bank, data pasar saham, dan data pasar cryptocurrency. Sampel penelitian terdiri atas sepuluh bank KBMI 3 dan KBMI 4 yang dipilih menggunakan teknik purposive sampling sehingga diperoleh 60 observasi. Analisis data dilakukan menggunakan regresi linier berganda yang didukung oleh analisis statistik deskriptif dan pengujian asumsi klasik. Hasil penelitian menunjukkan bahwa cryptocurrency tidak berpengaruh signifikan terhadap harga saham, yang mengindikasikan bahwa fluktuasi pasar aset digital belum menjadi determinan utama dalam pembentukan harga saham sektor perbankan di Indonesia. Sebaliknya, profitabilitas berpengaruh positif dan signifikan terhadap harga saham, yang menunjukkan bahwa investor masih menjadikan kinerja keuangan perusahaan sebagai dasar utama dalam pengambilan

keputusan investasi. Selain itu, cryptocurrency dan profitabilitas secara simultan berpengaruh signifikan terhadap harga saham, yang menunjukkan bahwa dinamika pasar eksternal dan kinerja internal perusahaan secara bersama-sama memengaruhi pembentukan harga saham. Temuan ini memperkuat Signaling Theory melalui peran profitabilitas sebagai sinyal positif bagi investor serta memperluas penerapan Arbitrage Pricing Theory dengan menunjukkan bahwa pengaruh cryptocurrency bersifat kontekstual dan dipengaruhi oleh karakteristik industri. Penelitian ini memberikan kontribusi empiris terhadap literatur keuangan digital, khususnya pada sektor perbankan Indonesia, serta memberikan implikasi praktis bagi investor, manajemen perbankan, dan regulator dalam merespons perkembangan digitalisasi keuangan dan ekosistem cryptocurrency.

Kata kunci: Cryptocurrency, profitabilitas, harga saham, bank KBMI, signaling theory, arbitrage pricing theory, Indonesia.

1. Introduction

The capital market is one of the main pillars in the modern financial system that functions as a means of intermediation between parties with surplus funds and companies in need of long-term financing. The strategic role of the capital market is not only limited to providing sources of funding for companies, but also as an investment instrument that is able to encourage economic growth through increasing the efficiency of capital allocation and the formation of company value. In recent years, the development of information technology and digitalization of the financial sector has significantly changed the characteristics of the capital market. The digitization of investment services, easy access to financial information, and the increasing use of online trading platforms have expanded investor participation, especially retail investors. In Indonesia, this phenomenon is reflected in the increasing number of investors that have continued to grow in recent years, supported by increasing financial literacy, digital financial inclusion, and the transformation of capital market services that are increasingly accessible to the public. These changes show that the dynamics of stock price formation are no longer only influenced by the company's fundamental conditions, but are also increasingly influenced by the development of financial technology (*digital finance*) that changes investor behavior and transaction mechanisms in the capital market (Bouri et al., 2022; Corbet et al., 2023).

One of the most prominent innovations in the development of *digital finance* is the emergence of cryptocurrencies as digital assets based on blockchain technology. Cryptocurrencies offer decentralized characteristics, transparency, transaction efficiency, and global access that make them an investment alternative for modern investors. As the adoption of digital assets increases in various countries, the relationship between the cryptocurrency market and the stock market has become more close, attracting the attention of academics and financial practitioners alike. In Indonesia, the development of the cryptocurrency market shows a very rapid trend. Based on data from the Commodity Futures Trading Supervisory Agency (Bappebti), the number of crypto asset investors has exceeded 21 million users with transaction values reaching hundreds of trillions of rupiah throughout 2024. The increase shows that cryptocurrencies have become part of the national digital financial ecosystem. However, extremely high price volatility, high speculative activity, and sensitivity to changes

in global sentiment cause cryptocurrencies to have different risk characteristics compared to conventional investment instruments. A number of recent studies have shown that cryptocurrencies can be a source of *volatility spillover* on the stock market, although the magnitude of this influence depends heavily on economic conditions, the level of market integration, and the observed industry characteristics (Caferra & Vidal-Tomás, 2021; Umar et al., 2021; Mensi et al., 2023). Therefore, the influence of cryptocurrencies on stock prices is still a relevant issue and continues to be debated in the international financial literature.

In addition to external factors derived from the development of digital assets, internal factors of the company remain the main determinant in the formation of stock prices, especially in the banking sector which is highly dependent on investor confidence. One of the most commonly used fundamental indicators to assess a company's performance is profitability, which reflects a company's ability to generate profits through efficient management of assets and capital. Profitability ratios such as Return on Assets (ROA) and Return on Equity (ROE) are important indicators that investors use to evaluate a company's growth prospects, operational efficiency, and sustainability. From the perspective of Signaling Theory, high profitability is seen as a *positive signal* regarding the quality of management and the company's prospects so that it can increase investor confidence and encourage an increase in stock prices. This relationship is becoming increasingly important in the banking industry because profit stability reflects the bank's ability to manage risk, maintain asset quality, and maintain business sustainability amid global economic uncertainty. Especially in KBMI 3 and KBMI 4 banks, which have large core capital, high levels of digitalization, and a systemic role in maintaining the stability of Indonesia's financial system, profitability is one of the indicators that investors pay close attention to in determining investment decisions (Ozili, 2023; Pham et al., 2024).

Although the relationship between cryptocurrencies and the stock market has been a rapidly growing topic in the financial literature, the results of empirical research to date still show inconsistencies. Several studies report that the development of cryptocurrencies increases integration with traditional financial markets so that it is able to influence the formation of stock prices through the mechanism of *return spillover*, *volatility transmission*, and changes in investor sentiment. In contrast, other research has found that the influence of cryptocurrencies on the stock market is limited and depends on the characteristics of the industry, the level of development of the capital market, and the macroeconomic conditions behind it. Similar inconsistencies were also found in studies on profitability. Most studies show that profitability ratios such as Return on Assets (ROA) and Return on Equity (ROE) have a positive effect on stock prices because they reflect a company's ability to create value for shareholders. However, some studies have shown that the relationship becomes weaker when companies face economic uncertainty, rapid digital transformation, or changes in investor behavior due to increased use of digital assets. The difference in results indicates that the relationship between cryptocurrencies, profitability, and stock prices still requires further

empirical testing, especially in the banking sector, which has a high level of regulation and different fundamental characteristics than other sectors.

Based on these conditions, this research seeks to fill the research *gap* through several contributions. First, this study integrates external factors in the form of cryptocurrencies as a representation of the development of digital finance with internal factors in the form of profitability in explaining the formation of bank stock prices. This approach provides a more comprehensive perspective than previous studies that generally focus on only one factor separately. Second, this study specifically analyzes KBMI 3 and KBMI 4 banks which have large core capital, high levels of digitalization, and strategic roles in maintaining the stability of Indonesia's financial system, thus providing a different empirical context compared to previous research that used more market indices or entire industrial sectors. Third, the 2021–2023 research period represents the post-COVID-19 pandemic phase, which is a period when the digitalization of the financial sector, the development of cryptocurrencies, and the transformation of banking services are taking place intensively. Therefore, this research is expected to make an empirical contribution to the development of the literature on digital finance, expand the application of Signaling Theory and Arbitrage Pricing Theory, and provide practical implications for investors, banking management, and regulators in understanding stock price dynamics in the era of digital transformation. Based on this background, the purpose of this study is to analyze the influence of cryptocurrencies and profitability, both partially and simultaneously, on the share prices of KBMI 3 and KBMI 4 banks listed on the Indonesia Stock Exchange during the 2021–2023 period.

2. Literature Review and Hypothesis Development

2.1 Signaling Theory

The Signaling Theory introduced by Michael Spence explains that companies can reduce information asymmetry between management and investors through the delivery of relevant information regarding the company's condition and prospects. In the capital market, investors do not have the same access to internal information of the company as the management. Therefore, various information published by the company, especially financial statements and performance indicators, serves as a signal that investors use in evaluating the company's value and determining investment decisions. Information that shows an improvement in the company's performance will be interpreted as a positive signal that increases the demand for the stock and encourages the increase in the stock price. Conversely, information that reflects a decline in performance will be perceived as a negative signal that can depress the stock price (Connelly et al., 2011; Spence, 1973).

In the context of the banking industry, Signaling Theory is very relevant because profitability is one of the fundamental indicators that investors pay the most attention to in assessing the sustainability of bank performance. Profitability ratios such as Return on Assets (ROA) and Return on Equity (ROE) reflect the bank's ability to manage assets and capital to generate profits. The higher the profitability produced, the greater the investor confidence in the company's prospects, thereby increasing the market valuation. Thus, this theory provides

a conceptual foundation that changes in profitability will be responded to by investors through changes in demand for stocks, which ultimately affect the company's stock price.

2.2 Arbitrage Pricing Theory (APT)

Arbitrage Pricing Theory (APT) developed by Stephen Ross explains that returns and asset prices are not only influenced by one factor, but are the result of the interaction of various systematic risk factors derived from the economic environment and company conditions. Unlike the Capital Asset Pricing Model (CAPM) which relies on only one market risk factor, APT provides flexibility in including various macroeconomic and microeconomic variables that are empirically able to influence asset prices. In this perspective, changes in interest rates, inflation, exchange rates, developments in financial technology, and changes in investor preferences can be factors that affect the formation of stock prices.

The development of cryptocurrencies as one of the digital investment instruments has created a new source of external risk in the global financial system. The high volatility of crypto assets has the potential to affect investor behavior through the portfolio rebalancing mechanism, especially when investors shift their investments between the stock market and the cryptocurrency market. Therefore, based on APT, cryptocurrencies can be positioned as an external factor that affects the stock price, while profitability is an internal fundamental factor of a company. The combination of these two factors provides a comprehensive theoretical framework in explaining the dynamics of stock prices in the banking sector in the digital era.

2.3 Cryptocurrency and Stock Price

The development of cryptocurrencies has changed the global investment landscape through the emergence of digital asset alternatives that offer high rates of return but come with enormous volatility. A number of studies show that the relationship between cryptocurrencies and the stock market has been increasing since the COVID-19 pandemic due to increased integration between financial markets. Under certain conditions, an increase in the price of cryptocurrencies can attract capital flows from the stock market to digital assets, thereby reducing demand for stocks. However, in other conditions, the movement of cryptocurrencies actually reflects increasing investor optimism towards risky assets so that they can increase investment activities in the stock market. Therefore, the relationship between cryptocurrencies and stock prices is still a matter of debate in the international financial literature.

In the Indonesian banking sector, the influence of cryptocurrencies is estimated to be different from other sectors because the banking system is still under relatively strict regulations on the use of digital assets. However, the increasing number of cryptocurrency investors and the growing digitalization of financial services show that the dynamics of digital assets still have the potential to affect investors' perception of banking stocks. Based on the framework of Arbitrage Pricing Theory, cryptocurrencies can be seen as one of the external

factors that influence the formation of stock prices through changes in market sentiment and investment preferences.

H1: *Cryptocurrencies affect the share price of KBMI 3 and KBMI 4 banks listed on the Indonesia Stock Exchange.*

2.4 Profitability and Stock Price

Profitability is a fundamental indicator that describes a company's ability to generate profits from all its resources. In the banking industry, profitability not only reflects operational efficiency but also demonstrates the bank's ability to manage risk and maintain the sustainability of its business. Investors generally use the ROA and ROE ratios as a basis for evaluating the quality of a bank's performance because both ratios provide information about the effectiveness of the company's use of assets and capital.

According to Signaling Theory, increased profitability is a positive signal that reduces investors' uncertainty about the company's prospects. Information about increased profits will increase investor confidence thereby driving an increase in stock demand and ultimately increasing the company's share price. Conversely, a decline in profitability can be a negative signal that lowers investor interest. Therefore, the higher the level of profitability of the company, the higher the tendency of stock prices to form in the capital market.

H1: *Profitability has a positive effect on the share price of KBMI 3 and KBMI 4 banks listed on the Indonesia Stock Exchange.*

2.5 Cryptocurrency, Profitability and Stock Price

Stock prices are the result of the interaction of various internal and external factors of the company. Profitability provides information about a company's ability to generate profits, while cryptocurrencies reflect changes in external conditions that affect an investor's preferences in allocating his portfolio. These two variables work through different mechanisms but can both affect the formation of stock prices in the capital market.

In the perspective of Arbitrage Pricing Theory, stock prices are affected by a combination of several risk factors that work simultaneously. Therefore, cryptocurrencies as an external factor and profitability as an internal factor are estimated to collectively affect the bank's stock price. Simultaneous testing is important to find out the extent to which the combination of the two variables is able to explain the variation in stock prices in KBMI 3 and KBMI 4 banks during the research period.

H3: *Cryptocurrency and profitability simultaneously affect the share price of KBMI 3 and KBMI 4 banks listed on the Indonesia Stock Exchange.*

3. Research Method

This study uses a quantitative approach with an explanatory research design to examine the causal relationship between cryptocurrency and profitability on stock prices in the Indonesian banking sector. The quantitative approach was chosen because it allows the objective testing of the relationship between variables through statistical analysis based on numerical data, so as to provide empirical evidence regarding the influence of independent variables on

dependent variables. This research uses secondary data in the form of company financial statements, stock prices, and cryptocurrency data for the 2021–2023 period. The selection of the period was based on the consideration that after the COVID-19 pandemic, financial markets experienced an acceleration of digital transformation characterized by increased cryptocurrency trading activities as well as changes in investor behavior in the capital market. Thus, the research period is considered to be able to represent the dynamics of the relationship between the development of digital assets and the company's fundamental performance on the formation of stock prices. This approach is in line with empirical research recommendations in the financial sector that emphasize the use of panel data to explain the relationships between variables in a given observation period (Hair et al., 2022; Wooldridge, 2020).

The research population includes all banks in the category of Banks Group Based on Core Capital (KBMI) 3 and KBMI 4 listed on the Indonesia Stock Exchange during the 2021–2023 period. The sampling technique is carried out using purposive sampling with several criteria, namely the company consistently publishes audited annual financial statements, has complete closing *price data* during the observation period, and provides the information needed to calculate the profitability ratio. Based on these criteria, ten banks were obtained as a research sample with a total of sixty observation units. The dependent variable in this study is the stock price which is measured using the closing price of the stock every semester. The independent variables consist of cryptocurrencies that are propped using the transaction volume of Bitcoin and Ethereum as a representation of the crypto assets with the largest market capitalization, as well as profitability propped using Return on Assets (ROA) and Return on Equity (ROE). All data is obtained from official sources, namely the Indonesia Stock Exchange, the annual reports of each bank, CoinMarketCap, TradingView, as well as regulatory publications such as the Financial Services Authority and the Commodity Futures Trading Supervisory Agency to ensure the reliability and validity of research data.

Data analysis was carried out in stages through descriptive statistics, classical assumption testing, and multiple linear regression analysis using IBM SPSS software version 26. Descriptive statistics are used to describe the characteristics of each research variable through minimum, maximum, mean, and standard deviation values. Furthermore, normality, multicollinearity, heteroscedasticity, and autocorrelation tests were carried out to ensure that the regression model met the assumptions of *the Best Linear Unbiased Estimator* (BLUE). Hypothesis testing is carried out using a partial test (*t*-test) to evaluate the influence of each independent variable on the stock price, a simultaneous test (*F* test) to test the influence of the two variables together, and a determination coefficient (*Adjusted R²*) to measure the model's ability to explain stock price variations. The use of multiple linear regression is considered appropriate because the research aims to identify the influence of more than one independent variable on one dependent variable simultaneously or partially (Field, 2024; Hair et al., 2022).

4. Results

4.1 Sample Characteristics

This research uses secondary data obtained from annual reports, sustainability reports, and financial statements of banking companies that are included in the categories of KBMI 3 and KBMI 4 listed on the Indonesia Stock Exchange (IDX) during the 2021–2023 period.

The banking sector in the KBMI 3 and KBMI 4 categories was chosen because it represents banks with medium to large core capital scales that have a dominant role in the national financial system, and have high exposure to the development of digital financial technology, including cryptocurrencies. This condition makes this sector relevant for testing the relationship between digital finance variables, profitability, and stock prices.

The sample selection was carried out using purposive sampling techniques with the following criteria: (1) banks are consistently registered during the research period, (2) have complete financial statements, (3) stock closing price data is available per semester, and (4) are related to digital banking transformation. Based on these criteria, 10 sample banks were obtained with a total of 60 observations (firm-year/semester observations). This number of observations is considered sufficient to produce stable regression estimates in quantitative analysis based on secondary data (Hair et al., 2022; Sekaran & Bougie, 2021).

4.2 Descriptive Statistics

Descriptive statistics were employed to describe the distribution characteristics of the research variables, including minimum, maximum, mean, and standard deviation. The analysis is based on 60 observations obtained from KBMI 3 and KBMI 4 banks during the 2021–2023 period.

Table 1. Descriptive Statistics

Variable	N	Minimum	Maximum	Red	Std. Deviation
Cryptocurrency (Volume)	60	134,000	1,000,000+	—	—
Profitability (ROA/ROE)	60	0.97	5.88	3.30	—
Stock Price	60	—	—	3,22 3.05	2,257.63

Source: Processed secondary data (2026).

Descriptive statistical results show that cryptocurrency variables have a high level of volatility, with the peak of transactions occurring in the early half of 2021 and a significant decline in the final half of 2023. This reflects the nature of the cryptocurrency market which is heavily influenced by global sentiment, macroeconomic conditions, and the development of digital asset regulations.

Meanwhile, profitability measured through ROA and ROE showed a relatively stable pattern with an average value of 3.3% and low variation. These findings indicate that the financial performance of KBMI 3 and KBMI 4 banks was relatively consistent during the observation period, reflecting the operational stability of Indonesia's banking sector.

For the stock price variable, there is a fairly high variation between banks, with a striking difference between large banks (KBMI 4) and medium banks (KBMI 3). This shows that market valuations are heavily influenced by the size of banks, fundamental performance, and investors' perceptions of the stability and growth prospects of each institution.

4.3 Classical Assumption Tests

Before hypothesis testing, regression models are tested using several classical assumption tests to ensure the validity of the estimates.

Table 2. Classical Assumption Tests

Test	Indicator	Results	Conclusion
Normality	Kolmogorov–Smirnov	0.200	Normally distributed
Multicollinearity	VIVID	1.014	No multicollinearity
Autocorrelation	Durbin–Watson	2.093	No autocorrelation
Heteroscedasticity	Glejser Test	$p > 0.05$	Homoscedastic

Source: Processed research data (2026).

The test results show that the regression model meets the classical assumptions of OLS. A Kolmogorov–Smirnov significance value of 0.200 indicates that the residual is normally distributed. The VIF value of 1.014 indicates that there is no multicollinearity between independent variables.

In addition, the Durbin–Watson value of 2.093 indicates the absence of autocorrelation, while the Glejser test indicates no heteroscedasticity. Thus, the regression model meets the BLUE (Best Linear Unbiased Estimator) criteria and is therefore suitable for further analysis (Gujarati & Porter, 2021).

4.4 Multiple Regression Analysis

Multiple linear regression analysis is used to test the influence of cryptocurrencies and profitability on stock prices. The results of the model estimate are as follows:

$$Y = -675.824 + 0.000X_1 + 121,588.435X_2$$

The results showed that cryptocurrencies had no significant influence on stock prices ($p > 0.05$), while profitability had a positive and significant effect ($p < 0.05$). This shows that the share price of banking in Indonesia is more influenced by fundamental factors than by external factors based on digital assets.

4.5 Hypothesis Testing

4.5.1 Partial Effect (*t*-test)

The results of the *t*-test showed that:

- Cryptocurrencies have no significant effect on stock prices
- Profitability has a positive and significant effect on stock prices

These findings indicate that investors rely more on fundamental indicators such as ROA and ROE in assessing the performance and prospects of banks.

4.5.2 Simultaneous Effect (*F*-test)

Simultaneous tests showed that the research model was statistically significant ($F = 29,112$; $p < 0.001$), which means that cryptocurrencies and profitability together affect stock prices.

The value of the determination coefficient ($R^2 = 0.505$) showed that 50.5% of the stock price variation could be explained by the model, while the other 49.5% was influenced by other factors outside the study.

5. Discussion

5.1 *The Effect of Cryptocurrency on Stock Prices*

The results of the study show that cryptocurrencies do not have a significant influence on the share prices of KBMI 3 and KBMI 4 banks during the 2021–2023 period. These findings indicate that the increase in cryptocurrency trading activity has not yet become a major determinant in the formation of the stock price of the banking sector in Indonesia. Despite the rapid growth of digital assets, investors in banking stocks still tend to base their investment decisions on fundamental indicators rather than changes in the price and volume of cryptocurrency transactions. This condition can be explained by the characteristics of the Indonesian banking industry which is still under strict regulatory supervision, so that banks' direct exposure to crypto assets is relatively limited. In addition, the high volatility of cryptocurrencies causes investors to consider digital assets as alternative investment instruments that have a different risk profile from banking stocks.

These findings support the perspective of Arbitrage Pricing Theory (APT) which states that external factors do not always have the same influence on all industry sectors. Although cryptocurrencies are one of the systematic risk factors that are developing in the modern financial system, their effect on stock prices depends on the level of market integration, industry characteristics, and investors' response to changes in the economic environment. In Indonesia's banking sector, investors seem to be still more concerned about the stability of financial performance than the dynamics of the cryptocurrency market.

The results of this study are in line with the findings of Caferra and Vidal-Tomás (2021) who show that the relationship between cryptocurrencies and the stock market is dynamic and not always significant because it is influenced by global market conditions. These findings are also consistent with Fahrani and Bachtiar (2022) who concluded that cryptocurrencies do not have a significant influence on the Composite Stock Price Index (JCI). On the other hand, the results of this study are different from Corbet et al. (2020) and Ningsih et al. (2024) who found a positive relationship between the development of cryptocurrencies and the stock market. These differences are likely due to variations in the study period, sample characteristics, level of financial market integration, as well as differences in cryptocurrency regulation in each country. Thus, the results of this study strengthen the argument that the influence of cryptocurrencies on stock prices is contextual and cannot be generalized to all industry sectors.

5.2 *The Effect of Profitability on Stock Prices*

In contrast to cryptocurrencies, profitability has been proven to have a positive and significant influence on the share prices of KBMI 3 and KBMI 4 banks. These results show that a company's ability to generate profits is still the main indicator used by investors in evaluating the value of the company. The higher the level of profitability that the bank produces, the greater the investor expectations for the company's growth prospects, which encourages an increase in demand for stocks and an increase in stock prices. This shows that fundamental

factors are still the main basis for investment decision-making in the Indonesian banking sector.

The findings are in line with the Signaling Theory, which explains that information about increasing profitability is a positive *signal* conveyed by management to investors. A high level of profitability reduces information asymmetry between management and investors and increases market confidence in the company's ability to generate future cash flow. Therefore, the market responds to increased profitability through an increase in stock prices as a form of adjustment to the company's intrinsic value.

The results of this study are consistent with the research of Muhidin and Situngkir (2023) which found that Return on Assets (ROA) has a positive effect on the stock price of banking companies. These findings also support Mayanti's (2022) research which shows that profitability indicators have an important contribution to increasing company value. In addition, the results of this study are in line with various international studies that state that financial performance is a major determinant of a company's valuation because it reflects operational efficiency, profit-generating ability, and the company's long-term growth prospects (Brigham & Houston, 2022). Therefore, this study further confirms that profitability remains the most dominant fundamental factor in determining the stock price of the banking sector.

5.3 Simultaneous Effect of Cryptocurrency and Profitability on Stock Prices

The results of the simultaneous testing showed that cryptocurrencies and profitability together had a significant effect on the share price of KBMI 3 and KBMI 4 banks. Although cryptocurrencies have no partial effect, their existence along with the profitability variable is able to improve the model's ability to explain stock price variations with a determination coefficient value of 50.5%. These findings show that the formation of stock prices is the result of the interaction between internal factors of the company and external factors that develop in the financial market environment.

In the perspective of Arbitrage Pricing Theory, stock prices are not only influenced by one risk factor, but by a combination of various economic, financial, and company characteristics. Profitability represents the fundamental qualities of a company, while cryptocurrencies describe the development of the digital investment environment that affects investor sentiment. Therefore, although cryptocurrencies are not yet the main determinants individually, their existence still contributes to the formation of stock prices when analyzed together with the fundamental factors of the company.

The findings of this study support the research of Caferra and Vidal-Tomás (2021) who explain that the relationship between cryptocurrencies and the stock market is increasingly complex after the increasing digitalization of the global financial system. The results of this study are also consistent with Kwapien et al. (2021) who showed that the dynamics of cryptocurrencies can influence investor behavior through changes in market sentiment, although these influences differ in each industry sector. Thus, this study provides empirical evidence that investors in the Indonesian banking sector not only consider the development

of digital assets, but also continue to make profitability a key factor in the investment decision-making process.

6. Implications

This research contributes to the development of Signaling Theory and Arbitrage Pricing Theory. The results of the study show that Signaling Theory still has strong relevance in explaining investor behavior in the Indonesian banking sector, as profitability has proven to be the main signal that affects stock prices. On the other hand, the findings on cryptocurrencies expand the application of Arbitrage Pricing Theory by showing that external factors in the form of digital assets do not necessarily have a direct influence on stock prices in industries that have strict regulations such as the banking sector.

6.1 Practical Implications

For investors, the results of this study confirm that fundamental analysis, especially profitability, remains the main consideration in determining investment decisions in banking stocks. The development of cryptocurrencies should be treated as complementary information that reflects the dynamics of the financial market, rather than as the primary basis for determining the value of a bank's shares. For banking management, efforts to maintain a high level of profitability are an important strategy to increase investor confidence and maintain stock price stability. Meanwhile, for regulators, the results of this study show the importance of creating a regulatory framework that is adaptive to the development of digital assets without reducing the stability of the national financial system.

6.2 Theoretical Implications

This research contributes several to the development of the literature on capital market behavior, particularly on the relationship between cryptocurrency development, profitability, and stock prices of the banking sector in developing countries. First, the research findings reinforce the relevance of Signaling Theory by showing that profitability is still the fundamental signal that investors pay the most attention to in evaluating a company's value. The positive and significant influence of profitability on stock prices shows that information about the bank's ability to generate profits is able to reduce information asymmetry between management and investors, thereby increasing market confidence in the company's prospects. Thus, this study provides empirical evidence that the mechanism of signal delivery through financial performance is still the main determinant in the formation of stock prices in the Indonesian banking industry.

Second, this study expands the application of Arbitrage Pricing Theory (APT) in the context of digital asset development. Although cryptocurrencies have not been shown to have a partial effect on stock prices, the results of the study show that the variable still contributes when analyzed simultaneously with profitability. These findings indicate that the influence of external factors on stock prices is contextual and influenced by the characteristics of the industrial sector, the level of financial market integration, and the applicable regulatory framework. Therefore, this study enriches the literature on the relationship between

cryptocurrencies and the capital market by showing that corporate fundamentals still have a more dominant role than the development of digital assets in the Indonesian banking sector.

Third, this research makes an empirical contribution to the literature on digital finance in developing countries. Most of the previous research focused on the relationship of cryptocurrencies to stock market indices or technology companies, while this study specifically examined the KBMI 3 and KBMI 4 banks which have the characteristics of large capital, high levels of digitalization, and systemic role in national financial stability. Therefore, the results of this study expand the empirical evidence on how a combination of internal and external factors affects the formation of stock prices in the banking industry in the era of digital transformation.

6.3 Practical Implications

The results of this study provide several practical implications for investors, banking management, and regulators. For investors, this study shows that fundamental analysis remains the main basis for investment decision-making in banking stocks. Profitability driven through ROA and ROE has proven to provide stronger signals than cryptocurrency developments, so investors are advised to prioritize evaluating the company's financial performance rather than just following the fluctuations of digital assets that are highly volatile. Thus, fundamental-oriented investment strategies are expected to be able to produce more rational and sustainable investment decisions.

For banking management, the findings of this study confirm the importance of maintaining profitability as one of the main indicators that affect investors' perception of company value. Efforts to improve operational efficiency, strengthen the quality of productive assets, optimize risk management, and expand digital service innovation are important strategies to maintain financial performance and increase company value in the capital market. Additionally, while cryptocurrencies have not yet had a direct impact on stock prices, the development of blockchain technology and digital assets still needs to be monitored as part of a long-term digital transformation strategy.

For regulators, especially the Financial Services Authority (OJK) and Bank Indonesia, the results of this study show that the stability of the stock price of the banking sector is still more influenced by fundamental factors than cryptocurrency trading activities. However, the rapid growth of the digital asset ecosystem requires adaptive policies so that financial technology innovation can develop without reducing the stability of the national financial system. Regulations that are able to balance innovation and risk mitigation are expected to increase investor confidence while strengthening the integration of Indonesia's financial market in the global digital financial ecosystem

7. Limitations and Future Research Directions

7.1 Limitations

Although this study provides empirical evidence regarding the influence of cryptocurrencies and profitability on stock prices at KBMI 3 and KBMI 4 banks in Indonesia, there are several

limitations that need to be considered in interpreting the results of the study. First, this study only uses samples of KBMI 3 and KBMI 4 banks listed on the Indonesia Stock Exchange during the 2021–2023 period. The focus on the group of banks with large core capital means that the results of the research cannot be generalized to all banking sectors, especially KBMI 1 and KBMI 2 banks as well as other industrial sectors that have different operational characteristics, risk structures, and investor behaviors.

Second, this study only used two independent variables, namely cryptocurrency and profitability, to explain stock price variations. In fact, based on modern financial theory, the formation of stock prices is influenced by various other factors, both macroeconomic and company-specific, such as inflation, interest rates, exchange rates, economic growth, the quality of corporate *governance*, company size, stock liquidity, dividend policy, and market sentiment. This is reflected in the value of the determination coefficient of 50.5%, which shows that there is still around 49.5% of stock price variations explained by other factors outside the research model.

Third, cryptocurrencies in this study are projected to use the transaction volume of Bitcoin and Ethereum as a representation of the development of the digital asset market. Although both assets have the largest market capitalization, this approach has not fully illustrated the complexity of the fast-growing cryptocurrency ecosystem. Factors such as the price volatility of crypto assets, market capitalization, stablecoins, decentralized finance (DeFi), non-fungible tokens (NFTs), and regulatory policies on digital assets have not been accommodated in the research model. Therefore, the results of this research still need to be interpreted carefully in the context of financial technology developments that continue to undergo changes.

7.2 Future Research Directions

Based on these limitations, further research is recommended to expand the scope of research both from the aspects of data, variables, and analysis methods. First, subsequent research can extend the observation period to include the period before and after the implementation of various policies related to digital assets in Indonesia. The expansion of the time horizon is expected to provide a more comprehensive picture of the dynamics of the relationship between cryptocurrencies and stock prices in the long term and capture changes in investor behavior in various phases of the economic cycle.

Second, future research is recommended to include additional variables that represent macroeconomic conditions, company characteristics, and governance factors. Variables such as inflation, policy interest rates, exchange rates, company size, credit risk, *capital adequacy ratio*, quality of corporate governance, and sustainability indicators (*Environmental, Social, and Governance* or ESG) have the potential to provide a more comprehensive explanation of stock price determinants. In addition, the research can also develop cryptocurrency measurement using price volatility indicators, cryptocurrency market indices, and social media-based investor sentiment so that it can capture the influence of digital assets more accurately.

Third, further research can adopt more advanced analysis methods, such as panel data regression (*fixed effects* or *random effects*), *dynamic panel Generalized Method of Moments (GMM)*, *quantile regression*, and *structural equation modeling (SEM)*, so that it is able to overcome data heterogeneity and provide a stronger causal relationship estimate. Comparative research between countries and across industry sectors is also interesting to be conducted to evaluate whether the influence of cryptocurrencies on stock prices differs in countries with different levels of digital asset adoption and levels of capital market development. This approach is expected to enrich the literature on the integration between capital markets and digital asset ecosystems in developing countries.

8. Conclusion

This study aims to analyze the influence of cryptocurrencies and profitability on stock prices in KBMI 3 and KBMI 4 banks listed on the Indonesia Stock Exchange during the 2021–2023 period. The results show that cryptocurrencies do not have a significant influence on stock prices, while profitability has a positive and significant effect on stock prices. In addition, simultaneous testing shows that cryptocurrencies and profitability together have a significant effect on stock prices. These findings indicate that despite the rapid development of digital assets and becoming part of the modern financial ecosystem, investors in the Indonesian banking sector still prioritize the company's fundamental indicators in evaluating investment value and prospects.

The findings of this study provide empirical support for the Signaling Theory, which explains that profitability is a positive signal that is able to reduce information asymmetry between management and investors thereby increasing market confidence in the company. On the other hand, the results of the study also expand the perspective of Arbitrage Pricing Theory (APT) by showing that the influence of external factors, such as cryptocurrencies, is not always direct and significant on stock prices, but is influenced by industry characteristics, the level of integration of financial markets, and the regulatory environment. Thus, this study shows that fundamental factors still have a more dominant role than the development of digital assets in determining the stock price of the Indonesian banking sector.

In terms of scientific contribution, this study enriches the literature on the relationship between cryptocurrencies and the capital market by presenting empirical evidence from the Indonesian banking sector, especially KBMI 3 and KBMI 4 banks which have the characteristics of large capital, high levels of digitalization, and strategic roles in maintaining the stability of the national financial system. Unlike most previous studies that focused on stock market indices or non-financial companies, this study combines external factors in the form of cryptocurrency development with internal factors in the form of profitability in one empirical model. This approach provides a more comprehensive understanding of the formation of stock prices in the banking industry in the era of digital transformation.

Practically, the results of this study imply that investors need to continue to prioritize fundamental analysis, especially profitability, in making investment decisions in banking stocks. For banking management, increasing profitability through operational efficiency, effective risk management, and digital service innovation is an important strategy to increase the company's value in the capital market. Meanwhile, regulators are expected to continue to develop policies that are able to accommodate digital asset innovation without reducing the stability of the national financial system. Further research is suggested to extend the

observation period, include macroeconomic and corporate governance variables, and apply more comprehensive analysis methods, such as dynamic panel data regression or *machine learning-based* approaches, in order to gain a deeper understanding of the dynamics of the relationship between digital assets, company performance, and stock prices in various industry sectors.

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