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Stock Valuation Analysis Using Discounted Cash Flow and Price Earning Ratio for Investment Decision Making in Mining Companies Listed on the ESG Sector Leaders IDX KEHATI

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A B S T R A C T

Stock valuation is very important for investors to make a good investment decision in order to get the desired profit. This study uses Discounted Cash Flow (DCF) and Price Earning Ratio (PER) to determine the fair value of shares. This study uses a descriptive applied quantitative method that focuses on the shares of mining companies listed on the ESG Sector Leaders IDX KEHATI. There are 3 out of 9 companies that meet the sampling criteria, namely AKRA, ANTM, and ELSA. The results indicated that the fair value of the three stocks was undervalued. The Root Mean Square Error (RMSE) value of the PER method is smaller, which means it is more accurate. The investment decision recommendation is to buy these stocks.

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INTRODUCTION

Investment is a commitment to funds or other assets made at this time to generate future profits (Tandelilin, 2017). One popular avenue for such investments is the capital market. Over recent years, interest in capital market investments has surged among the public, as evidenced by the steady increase in the number of investors, as tracked through the Single Investor Identification (SID). One highly sought-after investment instrument in the capital market is stock investment. Shares listed in the capital market consist of various shares of companies engaged in certain fields, one of which is a company involved in mining. Investment in the mining sector ranked first in the primary sector in the realization of investment Quarter II of 2024 amounting to Rp34,8 trillion. In addition, Indonesia has a huge potential for mining products that can contribute to state revenue, this can be seen from the increasing contribution of the mining sector growth to the national Gross Domestic Product. This condition shows the added value of the mining sector which can be an attraction for investors to invest in companies in the mining sector. However, despite its good prospect, mining companies have a bad stigma toward sustainability issues (Taufikurahman et al., 2023). One indicator that is widely used to measure the sustainability and ethical impact of investment returns is Environmental, Social, and Governance (ESG). The application of ESG encourages companies to behave ethically which will help investors to avoid losses if the company behaves in a way that can cause risk (Ruth et al., 2023). Thus, ESG assessment indicators need to be considered in choosing a company that will be used as an investment destination. These indicators can be found in stocks listed on the ESG Sector Leaders IDX KEHATI index, which are leading stock with good ESG performance and liquidity form their sectors, so they have the opportunity to generate profits by investing in these stocks. In addition to ESG indicators, the performance of a stock can be seen through the movement of the stock price. Mining stock prices fluctuated and there was a decline last year, although the growth rate increased. The decline in share prices and the increase in the growth rate against GDP are due to fluctuations in mining commodity prices. The share price of mining companies is very sensitive and is influenced by fluctuations in mining commodity prices (Astuti & Anwar, 2019). Fluctuations in stock prices caused by fluctuations in commodity prices can cause the risk of mispricing or not reflecting the true value. This shows the risk of investing in mining companies, to minimize this risk, stock valuation is needed to make the right investment decisions (St. Hasnia et al., 2023).

Stock valuation involves compairing a stock's market value to its intrinsic value. If the market price of a stock is below its fair price, it is called undervalued and the decision is to buy. Meanwhile, if the market price is above its fair price, the stock is called overvalued and the decision is to sell or wait for a price decline (Budiman, 2021). This study uses the Price Earning Ratio (PER) and Discounted Cash Flow (DCF) methods in conducting stock valuation. The PER examines the relationship between a company's stock price and its earnings. In contrast, the DCF method evaluates the company's cash inflow, including factors like dividends and profits (Wira, 2014). In addition, to

measure the accuracy of the two stock valuation methods, the Root Mean Squared Error (RMSE) test is used to find the method that has the smallest deviation value, which means it is more accurate.

The novelty in this research is that the object used is mining companies that consider ESG indicators and have gone through the assessment stage, so they are listed on the IDX KEHATI ESG Sector Leaders index. This research makes an important contribution to investment decision making by analyzing using the Discounted Cash Flow (DCF) and Price Earning Ratio (PER) methods in mining companies listed on the ESG Sector Leaders IDX KEHATI index, and analyzing the accuracy level of the two methods. Taking into account the described phenomenon and its background, this study aims to analyze stock valuation using the PER and DCF methods for investment decision-making in mining companies listed on the ESG Sector Leader IDX KEHATI index and to analyze the accuracy level of the two methods.

LITERATURE REVIEW

Signaling Theory

Signaling theory introduced by Michael Spence in 1973, elucidates how information owners convey signals that reflect the condition of their company to benefit potential investors. Signaling theory emphasizes the importance of shared announcements that guide investors in making informed investment decisions (Hartono, 2017). The information provided is in the form of company financial reports in which there is credible company financial information and is considered an important indicator for investors in making investment decisions.

Discounted Cash Flow (DCF) Method

The DCF method is a widely used approach for stock valuation that is grounded in the principle of the Time Value of Money. This principle asserts that money has the potential to grow over time, primarily due to interest rates (Budiman, 2021). The DCF method operates on the premise that the future cash inflows to a company, when appropriately discounted, represent the fair present value of its shares. By considering various sources of income, such as dividends and profits, this method provides a comprehenesive analysis of a company's financial potential (Wira, 2014).

Price Earning Ratio (PER) Method

The PER method is a comparison between stock prices and company earnings. PER provides information on how many dollars the price investors have to pay to get every Rp 1 of company income. This method is also called price multiplier, which means that investors will calculate how often (multiplier) the value of income is reflected in the price of a stock (Tandelilin, 2017).

Root Mean Square Error (RMSE)

A comparison of accuracy values is carried out to determine the method that provides the most accurate results among other methods used. Accuracy

testing can be done using Root Mean Square Error (RMSE), RMSE is employed to assess the discrepancy between the actual value and the predicted value (Afrianto et al., 2013). A lower RMSE value indicates a better stock valuation method (Noor, 2014).

Investment Decision Making

Investors can make informed investment decisions by compairing a stock's intrinsic value to its current market price (Tandelilin, 2017). Guidelines that can be used for making stock investment decisions are as follows:

1. If the intrinsic value of a stock exceeds its current market price, it indicates that the stock is undervalued. It is recommended to make investment decisions by buying for those who do not have shares and increasing ownership for those who already own the shares.
2. If the intrinsic value of a stock less than its current market price, it indicates that the stock is overvalued. It is recommended to make investment decisions by selling for those who already own shares and recommended not to buy.
3. If the intrinsic value of a stock equal to its current market price, its indicates that the stock is fair valued. It is recommended to make investment decisions by holding until the stock price increases.

Research Stages

The research stages in this study is presented as fellows:

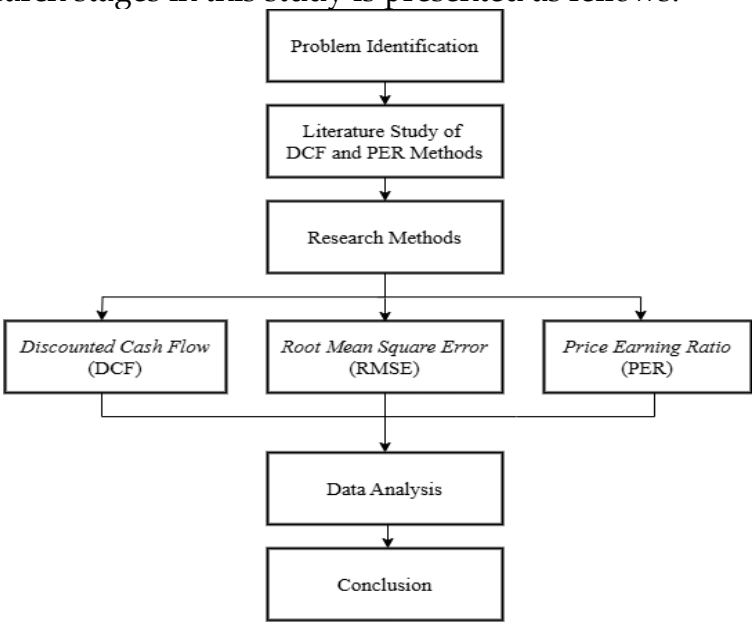

Figure 1. Research Stages

Source: Data processed (2024)

METHODOLOGY

This study employs a descriptive applied quantitative research design, utilizing secondary data sourced from the financial statements of a company spanning the years 2021 to 2023. The research focuses on a population of 9 mining companies listed on the ESG Sector Leaders IDX KEHATI index within that same period. For the sampling process, a purposive sampling technique

was adopted, which involves selecting samples based on spesific criteria and considerations (Sugiyono, 2013). The criteria for sampling in this study are outlined as follows:

1. Mining companies listed on the ESG Sector Leaders IDX KEHATI index during the 2021-2023 period.
2. Mining companies that are consistently listed on the ESG Sector Leaders IDX KEHATI index during the 2021-2023 period continuously.
3. Mining companies listed on the ESG Sector Leaders IDX KEHATI index that have published complete financial reports and regularly distribute dividends during the 2021-2023 period.

According to the sampling criteria outlined above, three companies were selected as research samples, which are presented in the table below:

Table 1. Research Sample

No	Stock Code	Company Name
1	AKRA	PT AKR Corporindo Tbk
2	ANTM	PT Aneka Tambang Tbk
3	ELSA	PT Elnusa Tbk

Source: Data processed (2024)

The data analysis employs the Discounted Cash Flow (DCF) method, which incorporates the concepts of the time value of money, alongside the Price Earning Ratio (PER) for stock valuation. Additionally, the Root Means Squared Error (RMSE) is used to calculate the accuracy level of these valuation methods.

RESEARCH RESULT

Discounted Cash Flow (DCF) Method

In the DCF method, the steps that need to be taken to find the future value of EPS and the projected share price, account for accumulated dividends, estimate the future value of total shares, calculate the rate of return (r), and then the intrinsic value, so that the following results are obtained:

Table 2. Results of DCF Method Stock Calculation

	AKRA	ANTM	ELSA
Future Value EPS	Rp 169,04	Rp 255,51	Rp 103,42
Future Value of Stock Price	Rp 2.028,44	Rp 3.066,08	Rp 1.241,03
Accumulated Dividends	Rp 299,64	Rp 224,97	Rp 116,12
Future Value Total	Rp 2.328,08	Rp 3.291,05	Rp 1.357,15
Rate of Return (r)	0,14	0,14	0,14
Intrinsic Value (PV)	Rp 1.571,39	Rp 2.221,37	Rp 916,04
Stock Price	Rp 1.475,00	Rp 1.705,00	Rp 388,00
Stock Condition	Undervalued	Undervalued	Undervalued
Investment Decision	Buy	Buy	Buy

Source: Data Processed (2024)

The results of the DCF method calculation show that AKRA, ANTM, and ELSA stocks are undervalued because their intrinsic value or fair price is greater than the stock market price.

Price Earning Ratio (PER) Method

In the PER method, the steps that can be taken are calculating the expected dividend rate growth (g), EPS estimation, DPS estimation, expected rate of return (k), PER estimation, and then the intrinsic value, so that the following results are obtained:

Table 3. Results of PER Method Stock Calculation

	AKRA	**ANTM**	**ELSA**
g	0,0451	0,0817	0,0507
Estimated EPS	Rp 132,73	Rp 181,73	Rp 71,45
Estimated DPS	Rp 130,64	Rp 86,00	Rp 27,21
k	0,13	0,13	0,12
Estimated PER	11,61	10,15	5,71
Intrinsic Value	Rp 1.541,52	Rp 1.844,36	Rp 407,68
Stock Price	Rp 1.475,00	Rp 1.705,00	Rp 388,00
Stock Condition	Undervalued	Undervalued	Undervalued
Investment Decision	Buy	Buy	Buy

Source: Data processed (2024)

The results of the PER method calculation show that AKRA, ANTM, and ELSA stocks are undervalued because their intrinsic value or fair price is greater than the stock market price.

Method Accuracy Measurement

The measurement of the accuracy level of the stock valuation methods is carried out to determine the valuation method that has a better level of accuracy in determining the fair price of share, so the following results are obtained:

Table 4. RMSE Calculation of DCF Method

Company	**Intrinsic Value (Y_i)**	**Closing Price (O_i)**	**Error $(Y_i - O_i)^2$**	**Square of Error $(Y_i - O_i)^2$**
AKRA	1.571,39	1.475	96,388	9.290,639
ANTM	2.221,37	1.705	516,367	266.634,927
ELSA	916,04	388	528,038	278.824,196
Total				554.749,762

Source: Data processed (2024)

$$\text{RMSE} = \sqrt{\frac{\sum_{i=1}^{n}(Y_i - O_i)^2}{n}} = \sqrt{\frac{554.749,762}{3}} = 430,019$$

Table 5. RMSE Calculation of PER Method

Company	Intrinsic Value (Y_i)	Closing Price (O_i)	Error $(Y_i - O_i)^2$	Square of Error $(Y_i - O_i)^2$
AKRA	1.541,52	1.475	66,522	4.425,243
ANTM	1.844,36	1.705	139,355	19.419,909
ELSA	407,68	388	19,685	387,481
Total				24.232,633

Source: Data processed (2024)

$$\text{RMSE} = \sqrt{\frac{\sum_{i=1}^{n}(Y_i - O_i)^2}{n}} = \sqrt{\frac{24.232,633}{3}} = 89,875$$

Table 6. Method accuracy measurement results

Method	RMSE Value	Description
Discounted Cash Flow (DCF)	430,019	The RMSE results of the PER method are smaller than DCF
Price Earning Ratio (PER)	89,875	
Conclusion	PER method is more accurate than DCF method	

Source: Data processed (2024)

Based on the calculation results, the DCF method has an RMSE value of 430,019, while the RMSE value of the PER method is 89,875. The RMSE results of the PER method are smaller than DCF, so it can be interpreted that the PER method has a better level of accuracy in assessing the fair price of the company's shares.

DISCUSSION

The stock valuation results, based on both the DCF and PER methods, indicate that the shares of PT AKR Corporindo Tbk (AKRA), PT Aneka Tambang Tbk (ANTM), and PT Elnusa Tbk (ELSA) are currently undervalued. This conclusion arises from the fact that their intrinsic values or fair prices, exceed their market prices at the end of 2023. When a stock is deemed undervalued, it suggests a favorable investment opportunity, highlighting a potential buy recomendation (Tandelilin, 2017). If it is associated with signalling theory, this undervalued stock price gives a positive signal to investors to buy the stock because it can generate profits if investors buy shares. Thus, the recommendation for making investment decisions for the three mining company stocks listed on the ESG Sector Leaders IDX KEHATI index is to buy for investors who do not yet own these shares and increase ownership for investors who already own AKRA, ANTM, and ELSA shares because undervalued shares mean that the stock market price is in cheap category. The findings of this study on stock valuation align with previous research, indicating that all stocks are undervalued when assessed using the PER method (Darmawan, 2016; Pengestika & Christianti, 2021).

The RMSE calculation results obtained from the PER method have a smaller value than the DCF method. A lower RMSE value indicates that the stock valuation method used is better (Noor, 2014). Thus, comparing the

accuracy of the PER and DCF valuation methods shows that the PER method is a more accurate or better method in assessing the fair price of shares when compared to the DCF method, so investors can optimize investment decision-making based on the PER method stock valuation to reduce the risk of loss. The PER method tends to be more stable because it focuses on available historical data and is less dependent on assumptions, but the PER method tends to be affected by fluctuations in stock prices or company profits in the short term, making it less reflective of more stable long-term values. In addition, the DCF method takes into account cash flow projections in the long term or focuses on future value projections, but this method is highly dependent on the assumptions used such as EPS growth, average PER, and the discount rate which makes it vulnerable to uncertainty and affects valuation results (Wira, 2014). The findings of this tudy align with earlier research indicating that the accuracy of the PER method surprasses that of the DCF method (Nyaman & Miftah, 2022; Pengestika & Christianti, 2021). However, these results contrast with previous studies that assert the DCF method achieves a higher level of accuracy than the PER method (Darmawan, 2016). The difference in research results can be caused by differences in research context such as sample data, period, and assumptions used. Investor need to pay attention to these factors when choosing a stock valuation method that will be used for investment decision-making according to each investors preferences.

CONCLUSIONS AND RECOMMENDATIONS

After analyzing the research findings and engaging in discussion, we can draw the following conclusions and recommendations:

1. The results of stock valuation using PER and DCF methods during the 2021-2023 period show that the shares of AKRA, ANTM, and ELSA are undervalued or are in a cheap price condition because the market price is lower than their fair price, so investors can make decisions by buying these shares for those who do not own and increasing ownership for investors who already own these shares.
2. The results of the RMSE calculation show that the PER method is more accurate than the DCF method in assessing the fair price of shares, so investors can optimize investment decision-making based on the PER method stock valuation. However, investors should still consider using other valuation methods because RMSE is used only to calculate the accuracy of the method and does not provide an indication of future stock performance. Thus, in stock valuation, the method used can be adjusted based on the preferences of each investor.

ADVANCED RESEARCH

This study uses historical data on mining companies for the 2021-2023 period, future research can use historical data with a period of more than 3 years so that the results are more accurate. Second, the number of samples used in this study were 3 mining companies listed on the ESG Sector Leaders IDX KEHATI index, future research can expand the research sample or use samples from other companies in various sectors. Third, this study uses two methods in

assessing the fair price of shares namely PER and DCF, future research can use other methods in stock valuation that can increase research accuracy such as DDM, PBV, FCFE, and FCFF.

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