Stock valuation using dividend discounted model and free cash flow to firm approach: case study at PT Superkrane Mitra Utama Tbk.

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Abstract

One of the benefits of conducting stock valuation is as a consideration in investment decisions. This study aims to conduct stock valuation using the Dividend Discounted Model (DDM) method, and the Free Cash Flow to Firm (FCFF) approach and to find out the most accurate stock valuation method using the Root Mean Squared Error (RMSE). This study will analyze the stock valuation of PT Superkrane Mitra Utama Tbk. (SKRN) in 2019-2023 because it is a company engaged in the construction and heavy equipment rental sector which is closely related to infrastructure development in Indonesia. Although the price is below the market average, SKRN is a fairly promising issuer based on the comparison of its CAGR percentage with the CAGR of the JCI so that it can attract investors. This study is a type of descriptive research with a quantitative approach using the documentation method to collect annual reports and financial reports of companies from the official website http://superkrane.com/id/. The results of the study stated that SKRN shares are undervalued using both the DDM method and the FCFF approach because their intrinsic value is greater than the stock market value and recommends investors to buy shares or hold if they already have SKRN shares. Meanwhile, the RMSE test results show that the FCFF approach is more accurate because it has a lower RMSE value than DDM.

Keywords:
Dividend Discounted Model; Free Cash Flow to Firm, Investment Decision, Root Mean Squared Error; Stock Valuation

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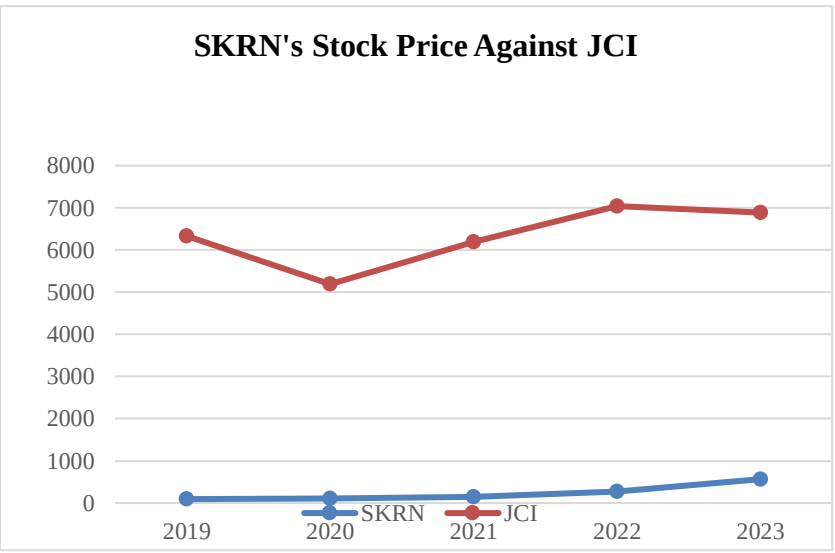
INTRODUCTION

As the times develop, the needs in the future will certainly be more difficult to predict, requiring a person to plan their finances for the future from now on in order to get a better life. One way is through investment as the right solution to achieve a decent life in the future. There are various definitions of investment according to experts. According to Bodie et al. (2019), investing is a decision now on a number of resources in the hope of making a profit in the future. Jordan et al. (2020) explain investment as a method to acquire wealth through financial allocation to expect future returns by considering risks as well as time horizons. In line with the definition of investment according to Tandelilin (2017) which defines investment as a commitment of a certain amount of money or other resources that is carried out now (present time) in the hope of obtaining benefits in the future.

Stock investment options can be made in companies listed in twelve sectors on the Indonesia Stock Exchange. In the twelve sectors, there are many sub-sectors, one of which is the construction machinery & heavy vehicles sub-sector, which is one of the important and closely related sub-sectors in the process of infrastructure development in Indonesia. One of the companies listed in the construction machinery & heavy vehicles sub-sector is PT Superkrane Mitra Utama Tbk. with the stock code SKRN which has just conducted an IPO or go public in 2018. The company is engaged in heavy equipment rental, lifting, construction and provides competent personnel services in these fields.

Figure 1.

Chart of SKRN's Stock Price Against JCI



Source: Author (s) work

The figure shows a comparison of SKRN's stock price with JCI. The average SKRN share price every year always increases even though it is still far below the JCI. This shows that SKRN's share price is still below the market average. However, when viewed from the

results of the CAGR comparison, PT Superkrane Mitra Utama Tbk. is much larger than the JCI. The CAGR of SKRN is 43% while the CAGR of JCI is only 2%. This shows that even though the price is still far below the market average, SKRN is a promising issuer, besides that SKRN has also in the last 5 years always distributed dividends and always earned profits so that it could attract investors to invest. Therefore, PT Superkrane Mitra Utama Tbk. or SKRN was chosen as the object of this study.

Stock investment activities are certainly expected to provide benefits for investors. But investors also need to consider the level of risk that may occur before making an investment. One of the risks that investors can experience is the risk of misprice. Misprice risk can occur when investors misestimate and identify the fair price of stocks, so investors need to analyze the fairness of stock prices to reduce this risk. There are several ways to conduct a fair analysis of stock prices or stock valuations, but in this article, the Discounted Cash Flow (DCF) method with the Free Cash Flow to Firm (FCFF) approach and the Dividend Discounted Model (DDM) method are used.

Stock valuation analysis has been carried out by many previous researchers such as Pangestika & Christianti (2021) who conducted stock valuations of cement sub-sector companies using various approaches including the Dividend Discounted Model (DDM) approach and the DCF approach through Free Cash Flow to Firm (FCFF). The results of stock valuation with the DDM approach show different results in each company but are mostly undervalued while for the DCF approach through FCFF, the results are mostly overvalued. For the results of the RMSE test, it is stated that the most accurate DDM approach.

According to Indriwan & Nurmatias (2023) in their research that analyzes the stock valuation of energy sector companies using the Dividend Discounted Model (DDM) and Free Cash Flow to Firm (FCFF) approaches. The results obtained from each approach also vary for each company. However, in the DDM approach, the results are mostly undervalued and for the FCFF approach, 12 undervalued companies and 10 overvalued companies were obtained. In addition, an RMSE test was also carried out to determine the most accurate approach and according to this study is the DDM approach.

Sitohang & Hutabarat (2023) conducts a valuation of shares of companies in the financial sector using various methods, one of which is the Dividend Discounted Model (DDM) with results that vary from company to company but most of them are overvalued. This DDM method is also the most accurate method based on the results of the RMSE test because it produces the lowest score. Another study was conducted by Dukalang et al. (2021) who conducted a valuation of the shares of banking companies listed in the JII Index through the DDM and FCFF approaches with different results from each approach in each company. The results of stock valuation using the DDM approach are that one company is overvalued, namely BRIS and one other company, BTPS, is undervalued. Meanwhile, if using the FCFF approach, the results obtained are different where BRIS is undervalued while BTPS is overvalued.

In a study conducted by Siregar (2021) by valuing three pulp and paper industry companies using various approaches, one of which is the FCFF approach, the difference in

results of the three companies was obtained, namely two undervalued and one overvalued, but in this study it is not explained which approach is the most accurate. Meanwhile, according to research conducted by Sari & Hermastuti (2020) stated that based on the Root Mean Squared Error test, the DDM method is the most accurate method to be used in stock valuation because the average value of RMSE DDM is smaller than other methods.

Based on research on stock valuation that has been carried out previously, most of them show that with different approaches and on different companies, the results of stock valuation will produce different conclusions. The study aims to determine the stock valuation of PT Superkrane Mitra Utama Tbk (SKRN) in 2019-2023 using the DDM method and the DCF method using the FCFF approach. Then compare which of the two methods is the most accurate using the Root Mean Squared Error (RMSE).

LITERATURE REVIEW

Stock

Shares according to Tandelilin (2017) are proof of partial ownership of a company. Shares are a type of capital participation in an issuer which is sometimes called a limited liability company (PT). According to Darmadji & Fakhruddin (2011), shares are an indication of a person's or business entity's ownership or involvement in a company or limited liability company. A piece of paper that states that the owner of the paper is the owner of the business that issued the securities is used to represent shares. The amount of participation invested in the business determines the ownership portion.

Stocks have several types, there are 2 most common types of stocks, namely common stock and preferred stock. Of the two types of stocks, common stocks are the most well-known securities by the Indonesian people. According to Tandelilin (2017), common shares represent the ownership of a company. Common stock is a document that proves ownership of a company. The term shareholder refers to an investor so that based on the reasons mentioned above, shares are used as proof of ownership of a Limited Liability Company (PT).

Stock Valuation

The definition of stock valuation is an assessment process carried out on the stock price of a company to find out whether it is in accordance with its intrinsic value or not. The valuation of a stock is not the same as the stock price because the stock price is the nominal price of the purchase. Stock valuation is a method to find stock values that are a measure in securities investment (Budiman, 2021). The purpose of stock valuation is to provide an overview of the estimated value of a company's shares which will be used as a reference for consideration of investment decisions in certain company shares. Valuing the value of shares is a prerequisite before investing. Because valuation can be the basis for decision-making that involves transferring large amounts of money or assets from one party to another, valuation becomes important (Thomas & Gup, 2010).

The level of future cash flow, because cash flow is a fact, and the risks associated with the implementation of the valuation, because future cash flows are always uncertain and contain dangers, is one of the things that needs to be observed in the analysis of stock

valuation or stock price valuation (Sukamulja, 2017). In order for their investment decisions to be correct or generate returns as expected, investors need to first conduct a stock valuation on the stocks they will choose. Tandelilin (2017) asserts that there are three categories of value in stock valuation, specifically:

a. Book Value: This figure is determined using the issuer's (stock issuing company's) bookkeeping.
b. Market Value: A stock's market value is determined by its price, which is the stock's *market* value.
c. Fair Value: Also referred to as theoretical value, fair value is the stock's actual or purported value.

Dividend Discounted Model (DDM)

Dividend Discounted Model (DDM) uses a dividend component to calculate a stock value (present value approach). By discounting all future dividend streams, the DDM model is used to estimate stock values (Tandelilin, 2017). The DDM technique has the advantage of being a derivative model of the concepts of cash flow and time value of money. The following is the formulation of the Dividend Discount Model (DDM):

a. Zero Growth Model

This model assumes that the dividends paid by the company will not experience growth. This model can be formulated as follows:

$$P_0 = \frac{D}{k}$$

Information:
P0 = Intrinsic value of the stock
D = Dividends to be received in a constant amount during future dividend payment periods
k = Required rate of return

b. Constant Growth Model

The Constant Growth Dividend Discount Model (DDM) or Gordon model assumes that future dividends have normal growth. Dividend forecasting has constant growth into the future (Bodie et al., 2019). From year to year, the company always strives to make profits and dividends grow as planned. Here are the steps to calculate the intrinsic value of a stock using the Dividend Discount Model (DDM) with constant expected dividend growth:

1) If D_0 is the newly paid dividend, and g is the fixed dividend growth rate, then the value of the stock can be calculated by:

$$P_0 = \frac{D_0(1+g)}{(1+k)} + \frac{D_0(1+g)^2}{(1+k)^2} + \frac{D_0(1+g)^3}{(1+k)^3} + \cdots + \frac{D_0(1+g)^\infty}{(1+k)^\infty}$$

2) The present value of the sequence of cash flows can be expressed more simply as follows, provided that the growth rate (g) is less than the discount rate (r):

$$P_0 = \frac{D_0(1+g)}{(k-g)} = \frac{D_1}{(k-g)}$$

Information:
P_0 = Intrinsic value of the stock
D_1 = Estimated dividend
k = Required rate of return
g = Dividend growth rate

c. Non Constant Growth

The assumption of an unconstant growth dividend is that in general, a company's ordinary stock dividend is not constant but changes according to the company's life cycle. The use of the gradual growth model is based on the idea that the company's profit growth will not be consistently high. If the industry in which a company operates has changed from a growth stage to a mature stage, then profit growth will also decrease. In determining the intrinsic value with the DDM method with a non-fixed dividend approach, the formula can be used:

$$P_0 = \frac{D_0(1+g)^1}{(1+k)^1} + \frac{D_0(1+g)^2}{(1+k)^2} + \ldots\ldots + \frac{D_0(1+g)^n}{(1+k)^n} + \frac{P_n}{(1+k)^n}$$

Information:
k = Expected rate of return
D_0 = Last year's dividend received/distributed
g = Dividend growth rate

Free Cash Flow to Firm (FCFF)

An approach used in the Dicounted Cash Flow (DCF) method to ascertain a company's intrinsic value based on future cash flows is Free Cash Flow to Firm (FCFF). The DCF approach makes use of the time value of money theory, which states that interest will cause money's present value to fluctuate from its future worth. According to Afriani & Asma (2019), FCFF is a cash flow that is accessible to all corporate fund providers. After accounting for all of the business's operating expenses and investment needs, FCFF is a cash flow available for all capital claims, including bondholders, preferred shareholders, and common shareholders (Wira, 2015). In the context of corporate valuation, the use of FCFF is more appropriate for companies with changing capital structures because this method is not affected by changes in leverage as is the case in the Free Cash Flow to Equity (FCFE) approach. This makes FCFF a more stable and comprehensive method of company valuation. According to Damodaran (2002), FCFF can be calculated using two ways, one of which is using the formula:

$$FCFF = EBIT(1 - T) + Depreciation - CaPex - \Delta Working\ Capital$$

WACC can be used as the discount rate in DCF stock valuation since it represents the proportion of the company's funding from debt and equity as well as systematic risk. Weighted by the proportion of each element in a company's capital structure, WACC is a weighted average of equity costs and after-tax loan costs. Brigham & Houston (2022) state that the following formula can be used to determine the Weighted Average Cosf of Capital (WACC):

$$WACC = w_d(r_d)(1 - T) + w_c(r_c)$$

Information:
w_d : Cost of debt
w_c : Cost of equity
r_d : Percentage of debt in capital structure
r_c : Percentage of equity in capital structure
T : Tax

In DCF-FCFF calculations, terminal values also play an important role. The accuracy of projections in the next few years will usually decrease, so accurate terminal value estimation is very important in the valuation process (Investopedia, 2024). The terminal value can be calculated using the formula:

$$Terminal\ Value = \frac{FCFF_5\ x\ (1 + Growth\ Rate)}{(WACC - Growth\ Rate)}$$

After it is known, the cash flow that has been discounted using WACC can then be calculated as enterprise value (EV) by summing the present value of FCFF from the first year to the fifth year with the present value of the terminal value. Then the intrinsic value can be calculated by subtracting the enterprise value by the net debt. Finally, to determine fair value or share value, it can be calculated by:

$$Fair\ Value = \frac{Intrinsic\ Value}{Share\ Outstanding}$$

Investment Decision Making

After valuing or valuing the shares in various methods, the next step that can be taken is to make a decision, namely selling, holding or buying the shares. The guidelines that can be used in conducting stock valuation and investment decision-making according to Rosalinda & Pratiwi (2018) are:

a. A stock is said to be undervalued when the state of intrinsic value is greater than the market price that occurs at a certain time (the price is cheap or low). In these conditions, the right decision taken by investors is to buy shares.
b. A stock is said to be fairvalued if the state of intrinsic value is the same as the market price that occurs at a certain time, meaning that this state is in a situation of equilibrium. In these conditions, the right decision to take is to buy the shares. In these conditions, the right decision taken by investors is to hold or keep the shares.
c. A stock is said to be overvalued when the state of intrinsic value is smaller than the market price that occurs at a particular moment (expensive or high). In these conditions, the right decision taken by investors is to sell shares.

Comparison of Stock Valuation Accuracy

Comparison of accuracy values is carried out to find out which method has the most accurate results among other methods. Accuracy testing can be done with Root Mean Squred Error (RMSE). An evaluation technique called Root Mean Square Error (RMSE) is used to quantify the variation between the model's projected values; the lower the RMSE number, the more accurate the value prediction process was (Ain & Fadila, 2023). RMSE is a measurement technique that calculates the estimated difference between the observed value and the values predicted by a model. The following formula can be used to get RMSE:

$$RSME = \sqrt{\frac{\sum_{i=1}^{n} (Yi - Oi)^2}{n}}$$

Information:
Yi = market price of year i
Oi = intrinsic value of year i
n = amount of data

RESEARCH METHOD

This study uses a quantitative technique and is classified as descriptive research. Research that determines the value of one or more independent variables without establishing connections or comparing them to other variables is known as descriptive research (Sujarweni, 2015). In research, the quantitative strategy is one that gathers and analyzes data as numerical values. The researcher will use the documentation technique to gather secondary data from PT Superkrane Mitra Utama Tbk's official website, http://superkrane.com/id/, in the form of annual reports and firm financial statements. The company's 2019–2023 annual and financial reports serve as the secondary data source. In this study, the author uses quantitative data analysis where the data is collected, classified, calculated, compared and analyzed based on the ratios obtained. The aspect studied in this study is the stock price in the market with the intrinsic value of PT Superkrane Mitra Utama Tbk shares with the stock code SKRN.

FINDINGS AND DISCUSSION

Dividend Discounted Model (DDM)

In carrying out the intrinsic value of SKRN shares using the Dividend Discount Model (DDM) method, the author assumes that the dividends distributed to investors have constant growth. Therefore, the author forecasts the performance of SKRN in the next 5 years using the least square forecasting technique. In calculating the present value of Dividend per Share (DPS), an average dividend growth of (-22.05%) and a desired yield of 5.33% is used.

Table 1.

DPS's Present Value Calculation

	2024	2025	2026	2027	2028
Net Profit	Rp 163.698	Rp 187.695	Rp 211.692	Rp 235.689	Rp 259.686
DPR	275%	275%	275%	275%	275%
Dividend	Rp 450.693	Rp 516.761	Rp 582.830	Rp 648.898	Rp 714.967
Outstanding Share	7.500	7.500	7.500	7.500	7.500
DPS	60,09	68,90	77,71	86,52	95,33
g	-22,05%	-22,05%	-22,05%	-22,05%	-22,05%
k	5,33%	5,33%	5,33%	5,33%	5,33%
PV	57,05	62,11	66,51	70,30	73,54
Total PV	330				

Source: Author(s), work

Based on the calculation, the total present value of dividends of 330 is obtained, so that the intrinsic value of SKRN shares can be known using the calculation formula of the constant growth model as follows:

$$P_0 = \frac{D_1}{(k-g)} = \frac{330}{(0{,}53-(-0{,}22)} = 439$$

So the intrinsic value of SKRN shares using the Dividend Discounted Model (DDM) approach is IDR 439/share, which shows undervalued conditions because the share price in the market as of April 30, 2024 is worth 304/share.

Free Cash Flow to Firm (FCFF)

The value of a company is reflected by the value of future prospects which indicates the company's ability to generate cash flow in the future. There are several components needed to calculate the FCFF projection, namely Earning Before Interest and Tax (EBIT), tax rate, depreciation & amortization, capital expenditure, and changes in net working capital. After determining the FCFF projection for 2024-2028, the next step is to calculate the present value of the FCFF projection. The component needed is the discount rate, where here the author uses WACC which consists of cost of equity and cost of debt with an amount of 9.5% based on Valueinvesting.io. In addition, to calculate the terminal value, a growth rate is needed, which is assumed to be 2%.

Table 2.
FCFF Projections and Fair Value Calculations

	2024	2025	2026	2027	2028	Terminal
Revenue	947.059	1.003.883	1.064.116	1.127.963	1.195.640	
COGS	(625.059)	(662.563)	(702.316)	(744.455)	(789.123)	
Operating Expenses	(113.647)	(120.466)	(127.694)	(135.356)	(143.477)	
Other Incomes	85.649	89.931	94.427	99.149	104.106	
Other Expenses	(66.294)	(70.272)	(74.488)	(78.957)	(83.695)	
EBIT	227.707	240.513	254.045	268.343	283.452	
Tax (22%)	(50.096)	(52.913)	(55.890)	(59.036)	(62.360)	
(+) EBIT (1-Tax)	**177.612**	**187.600**	**198.155**	**209.308**	**221.093**	
(+) Depreciation & Amortization	**148.120**	**177.354**	**208.338**	**251.010**	**244.860**	
(-) CapEx	**(179.941)**	**(218.455)**	**(246.923)**	**(270.071)**	**(295.457)**	
Account Receivables	376.292	392.439	479.358	511.648	554.697	
Account Payables	(250.548)	(357.398)	(524.353)	(455.079)	(536.217)	
Inventory	24.875	37.465	56.463	47.604	56.771	
Net Working Capital	150.619	72.506	11.468	104.173	75.251	
(-) Change in NWC	**315.538**	**78.113**	**61.038**	**92.705**	**28.922**	
FCFF	**(169.747)**	**68.386**	**98.532**	**282.952**	**141.574**	**1.925.404**
WACC	9,5%	9,5%	9,5%	9,5%	9,5%	9,5%
Present Value	(185.873)	74.883	107.892	309.832	155.023	2.108.317
Enterprise Value	2.570.075					
Net Debt	(236.719)					
Equity Value	2.333.356					
Outstanding Shares	7.500					
Fair Price	**311**					
Market Value	304					
Potential Upside	2%					

Source: Author(s), work

Based on the calculation results, a fair value of 311/share was obtained. This shows undervalued conditions with a potential upside of 2% due to the share price in the market of 304/share as of April 30, 2024.

Investment Decision

Table 3.
Investment Decision on SKRN Shares

Code	Method	Instrinsic Value	Market Price (30/04/24)	Condition	Decision
SKRN	DDM	Rp 439	Rp 304	Undervalued	Buy
	FCFF	Rp 311	Rp 304	Undervalued	Buy

Source: Author work

Based on the table above, it is found that by using the DDM and FCFF methods, SKRN shares are considered undervalued (intrinsic value > market price), so the recommendation for investment decisions for investors is to make SKRN companies as an option in buying shares while for investors who already own SKRN shares, it is recommended to keep or not sell SKRN shares.

Accuracy of Stock Valuation

After calculating the intrinsic value and knowing the investment decision using these methods, the next step is to test the accuracy of the stock valuation using the Root Mean Square Error (RMSE) test which serves to find out what is the most accurate method to determine an intrinsic value of a company. Based on the calculations that have been carried out, the RSME value for the DDM approach is 135 and the RSME value for the FCFF approach is 7. It can be seen that FCFF has smaller deviations when compared to DDM. The approach that has the highest accuracy for stock valuation is the FCFF approach, because the RMSE value of the FCFF method is the smallest than other methods. The smaller the value generated by the RMSE, the more accurate the valuation approach model on the stock price when estimating the intrinsic value of a stock.

CONCLUSIONS

The fair price analysis of SKRN shares in this study was carried out using the Dividend Discounted Model (DDM) and one of the approaches in the DCF method, namely Free Cash Flow to Firm (FCFF). Based on the performance projection for the next 5 years, namely 2024-2028 and with various assumptions set by the author, the fair value of SKRN shares was obtained using the Dividend Discounted Model (DDM) method of 439/stock, while by using the Free Cash Flow to Firm (FCFF) approach, the fair price of SKRN shares was obtained at 311/stock. This shows that SKRN shares are undervalued because the fair price is higher than the market price, which is 304/stock as of April 30, 2024. So that the investment decision that can be taken by investors is to buy SKRN shares for those who do not have them or hold SKRN shares for those who already have. Based on the RMSE test conducted to compare the two methods used, the RMSE value for the DDM method was 135 while the RMSE value for the FCFF approach was 7, which shows that the FCFF approach is more accurate than the DDM method because it has a smaller deviation value. However, the author is not responsible for the results of the investment decisions made. Investors still need to consider other factors because stock valuations do not fully determine the success of the investment.

LIMITATION & FURTHER RESEARCH

Due to the limitations of the researcher, this analysis only uses the Dividend Discounted Model (DDM) method and the Free Cash Flow to Firm (FCFF) approach with several assumptions of the researcher in valuing SKRN shares where the fair price generated is only for the benefit of shareholders. So that other researchers can conduct

further analysis using different methods or approaches by adding other assumptions that are not yet in this study to provide stronger investment decision results in SKRN stocks.

AUTHOR CONTRIBUTION

Naufal Alief Yulianto: Conceptualisation and Research Design, Data Collection, Methodology, Supervision, Writing Entire Paper, Conceptualisation, Data Collection and Analysis, Editing and Layouting.

Declaration of interest

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