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Stock Price Assessment with Fundamental Analysis as a Basis for Investment Decision Making

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Abstract

Fluctuating stock prices in the capital market cause investors to conduct an analysis first before making a decision whether to buy or sell shares. By conducting technical and fundamental analysis, investors can make investment decisions. Fundamental analysis can be done with several methods of stock valuation, which in this study uses the PER, DDM, DCF funds to see the intrinsic value of the stock. The study was conducted by comparing the intrinsic value with market value, thus indicating whether the stock is overvalued or undervalued. When the stock is in an overvalued condition, investors can sell, and vice versa. Because there are differences in stock conditions as indicated by the results of the PER, DDM and DCF valuation methods, a comparative analysis was carried out with the RMSE to see which stock valuation method was the most accurate. It is shown that DDM has the smallest deviation value so that DDM is the most accurate stock valuation method in stock fundamental analysis.

Keywords
stock price; PER; DDM; DCF; RMSE

I. Introduction

The COVID-19 pandemic has caused Indonesia's economic performance to decline drastically. The outbreak of this virus has an impact of a nation and Globally (Ningrum et al, 2020). The presence of Covid-19 as a pandemic certainly has an economic, social and psychological impact on society (Saleh and Mujahiddin, 2020). Covid 19 pandemic caused all efforts not to be as maximal as expected (Sihombing and Nasib, 2020). Even the performance of shares on the IDX has also decreased, especially in 2020. As of the end of June 2020, it was recorded in KSEI data that the total value of share assets in the ownership of local investors reached 50.1% to 65.6% of the total market capitalization of the IDX. (Son, 2020). Then in 2021, the performance of shares on the IDX will slowly increase. This is evidenced by the chart of the Composite Stock Price Index (JCI), which shows the price movement of all shares on the IDX in January 2021, which has an average of 6,257.84. This means that the economy is recovering. All parties play a role in the recovery of the Indonesian economy. The capital market also plays a role, by improving its performance.

Currently on the IDX there is an index that divides several sectors. Where shows the performance of stocks in the sectors contained in the IDX. The sector index that shows stock prices based on the IDX-IC classification (IDX Industrial Classification). The sector index consists of the energysector, the basic materialssector, the industrials, the consumer non-cyclicalssector, the consumer cyclicalssector, the healthcaresector, the financials, the property & real estatesector, the technologysector, the infrastructures, the transportation & logistics (Sidik, 2021). Among all sector indices on the IDX, there are sectors that have increased and decreased since the onset of COVID-19. The sectors that experienced an increase in stock prices from the end of 2019 to the middle of 2020 were stocks in the raw

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goods, industrial, primary consumer goods, health and financial sectors. Only seen from the investor demand factor as a result of company performance that remains good for listed companies in these sectors, it can lead to an increase in stock prices in these sectors in 2020. Meanwhile in 2021, the technology sector (IDX Sector Technology) which since 2019 has experienced a drastic decline, but in 2021 there has been a drastic increase in stock prices with a growth percentage reaching 115.78%.

Because stock prices in each sector fluctuate, it is necessary to do an analysis by investors before making investment decisions. There are methods that can be used to analyze stock prices with fundamental analysis. It aims to determine the intrinsic value of the stock which will later become a reference for investors in making decisions. The methods that are quite well known in fundamental analysis are the Price Earning Ratio (PER) method, the Dividend Discounted Model (DDM) method, and the Discounted Cash Flow (DCF) method. Other research states that PER is not more accurate than the DCF method (Darmawan & Budiman, 2016). However, there is no research that states that DDM is the most accurate method compared to other analytical methods. Meanwhile, there are other studies which state that the method of analyzing intrinsic value is FCFE (Audini, 2018).

II. Review of Literature

2.1 Signaling Theory

In general, the signal is defined as a signal made by the company (manager) to outside parties (investors). According to Spence in Febriana (2020) these signals can take the form of various forms, both those that can be directly observed or which must be studied more deeply to find out. By presenting a signal to external parties or investors by providing reliable financial data, later it can foster confidence in the picture of the company's development in the future (Febriana et al., 2020). The implementation of signal theory in this study is in the form of the company's annual financial statements listed on the IDX website.

2.2 Capital

Market The capital market is the same as a traditional market, which is a place to buy and sell securities at a price that has been agreed between the seller and the buyer (Carl, 2019). The capital market has a role as a facility for conducting transactions between buyers and sellers of securities. Securities that are traded can be in the form of stocks, bonds, mutual funds, and others.

2.3 Stock

Investment Investment itself is an activity where investors invest in companies, with the hope that investors will get profits or returns in a certain period (Wildatunjanah & Suparningsih, 2019). Stock investment is an investment with the highest risk, of course with return (Safitri et al., 2020). This is because in stock trading activities, stock prices fluctuate or change. So if you want to invest in stocks, you need to do an analysis with technical and fundamental analysis. In addition to analyzing, investors need to consider other micro and macroeconomic factors such as economic conditions, company business commodities, inflation, and others (Öztürk, 2017).

2.4 Stock valuation

According to (Hasanah & Rusliati, 2017) states there are at least two investment analyzes of the most commonly known stocks, namely technical analysis (technical analysis) and fundamental analysis (fundamental analysis). Technical analysis is used to assess stocks in order to make short-term decisions, by looking at historical data from stock price movements. Meanwhile, fundamental analysis is used to make long-term investment decisions, by evaluating the company's financial statements. Stock prices reflect one of the factors in investment decisions, where companies base their investment decisions on the ratio between the capital market value or the company's selling price in the market by using a comparison to the company's stock purchase price in the market. In conducting stock valuation or stock valuation, there are 3 (three) types of share value. Among them are intrinsic value, book value, and market value.

2.5 Fundamental Analysis

If you want to estimate stock prices in the future, it is necessary to analyze the performance or performance of the company's financial statements. That way, after knowing the company's financial performance is good, it can attract many influential investors by increasing the company's stock price (Ningrum et al., 2021). Fundamental analysis is used to see the intrinsic value of a stock, by looking at the fundamental condition of the company. Therefore, fundamental analysis requires data in financial statements such as revenue, company profits, liabilities, equity, funding, and others (Masruri Zaimsyah, 2019).

2.6 Approach Price Earning Ratio (PER)

The PER calculation method will show stock prices by comparing stock prices to earnings or earnings per share (Natalia et al., 2019). PER is the ratio of the price to be paid per share. With PER, investors can estimate how much the investor has to pay for a share. Therefore, the higher the PER, the higher the risk. However, it should be understood that in conducting stock valuation, investors can also compare the results of the PER calculation in the calculation year with the PER of the previous year. So it will be seen whether the target company has an increasing or decreasing PER. After knowing the intrinsic value of the calculation results using PER, it can be compared with stock prices because PER has a significant effect on stock prices (Öztürk, 2017).

2.7 Approach Dividend Discounted Model (DDM)

In calculating the rate of return or expected future return in the form of dividends, it is necessary to calculate the discount or reduction of cash dividends in the expected period with the expected rate of return whose dividend growth rate has been calculated. This is because in DDM the share price is the present value or the current value of dividends distributed in the future within a certain period (Hasanah & Rusliati, 2017). Therefore, with the DDM calculation, it is necessary to know the estimated dividend for the coming year (Dt).

2.8 Approach Discounted Cash Flow (DCF)

The DCF calculation method is a method with the concept of “Time Value of Money” to analyze future cash flows or Future Cash by using discounts on future values. DCF is like DDM, which analyzes future cash flows. However, DCF does not take into account the dividends that will be distributed in the future. The DCF method assumes that the firm value is the present value of the expected cash flows (Islami, 2020).

2.9 Investment Decision

After conducting a stock valuation or stock valuation by looking at the results based on the type of stock value, the results are visible for making investment decisions. Investors can make investment decisions whether they want to buy or sell the shares they own, or keep them. This can be done by investors when investors find out whether the existing stock is overvalued (the market value is greater than its intrinsic value), undervalued (the market value is lower than its intrinsic value), or is correctly valued.

III. Research Method

3.1 Operational Definition and Measurement of Variables

This study focuses on seeing which method is the most accurate for measuring the intrinsic value of a stock. Prior to that, in this study the intrinsic value was sought first with the three methods that became the focus of the research. The method of analysis which is also a variable in this study includes the method of calculating PER, DDM, DCF. After knowing the intrinsic value of the stock, it is then compared with the market value of the stock which will show how the stock is *undervalued* or *overvalued*. After that, a comparison is made on which method is the most accurate for measuring intrinsic value.

3.2 Population

According to Arikunto, the population is the entirety of the subject to be studied in the study (Darmawan & Budiman, 2016). In this study, all of the subjects taken were companies listed on the sectoral index (IDX-IC), and had been registered at least in 2018.

3.3 Samples

The samples were taken using the *purposive sampling method*. The sample used must meet the criteria, which consist of:

1. Companies listed on the IDX sectoral index (IDX-IC), at least in 2018 have been registered and included in the shares on the main board.
2. Published the company's financial statements on the IDX for the period 2018-2020.
3. Regularly pay dividends during the period 2018-2020.

IV. Result and Discussion

4.1 Description of Research Object Results

In this study, using the method sampling by *purposive sampling*. Where the sample used has met several criteria that support this research. The sample is taken from companies listed on the Indonesia Stock Exchange (IDX) at least in 2018 and listed on the main board. In addition, the companies included in this research sample have paid dividends regularly from 2018 to 2020. Based on the criteria, there are 24 companies that can be sampled in this study.

Table 1. Sample selection using purposive sampling method

Information	Number
of Companies listed on IDX-IC IDX	713
Companies not registered before or since 2018	(368)
Companies not included on the main board of the IDX	(19)
Companies that do not pay dividends regularly years 2018-2020	(302)
Companies that meet the criteria for research samples	24
Total research samples for 3 years (2018-2020)	72

Table 2. List of companies in IDX-IC that became the research sample

No.	Company Code Company	Name
1	PTBA	Bukit Asam Tbk.
2	FASW	Fajar Surya Wisesa Tbk.
3	SMGR	Semen Indonesia (Persero) Tbk.
4	UNTR	United Tractors Tbk.
5	AALI	Astra Agro Lestari Tbk.
6	DSNG	Dharma Satya Nusantara Tbk.
7	ICBP	Indofood CBP Sukses Makmur Tbk.
8	JPFA	Japfa Comfeed Indonesia Tbk.
9	PRDA	Prodia Widyahusada Tbk.
10	SIDO	Herbal and Pharmaceutical Industry Sido Muncul Tbk.
11	BBCA	Bank Central Asia Tbk.
12	BBNI	Bank Negara Indonesia (Persero) Tbk.
13	BBTN	State Savings Bank (Persero) Tbk.
14	BDMN	Bank Danamon Indonesia Tbk.
15	BJBR	Regional Development Bank of West Java and Banten Tbk.
16	BMRI	Bank Mandiri (Persero) Tbk.
17	BNGA	Bank CIMB Niaga Tbk.
18	BNII	Bank Maybank Indonesia Tbk.
19	MEGA	Bank Mega Tbk.
20	SDRA	Bank Woori Saudara Indonesia 1906 Tbk.
21	WOMF	Wahana Ottomitra Multiartha Tbk.
22	PWON	Pakuwon Jati Tbk.
23	MTDL	Metrodata Electronics Tbk.
24	TOWR	Sarana Menara Nusantara Tbk.

Source: BEI website, www.idx.co.id

4.2 Description of Research Data

This study uses the financial statements of the sample companies. The financial statements used are financial statements for 2018 to 2020, which are obtained from *website* IDXwww.idx.co.id). In addition, stock price data is taken from the company's historical data contained in *Google Finance*. The variables in this study include market values in the form of stock prices, DPR, EPS, k, Dt, FCF projections, PV from FCF, Terminal Value, and total PV.

a. Share Prices

Table 3. Share prices for 2018-2020

No.	Code	Price		
		2018	**2019**	**2020**
1	PTBA	4,300	2,660	FASW
2	7,775	7,475	7,700	_
3	SMGR	11,500	12,000	12,425
4	UNTR	27,350	21,525	26,600
5	AALI	11,825	14,575	12,325
6	DSNG	410	460	610
7	ICBP	10,450	11,150	9,575
2,810	9,575	2,150	1.5	280
JP	Share	Company	3,620	3,250
10	SIDO	840	638	805
11	BBCA	5,200	6,695	6,770
12	BBNI	8,800	7,925	6,175
13	BBTN	2,540	2,120	1,725
14	BDMN	3,200	3,950	915I
15	BJBR	2,050	1,250	1,550
16	BMRI	7,375	7,750	4GA900
_	_	_	_	_
_	_	_	_	2095
6,325	1985	7,550	6,800	7,200
20	SDRA	840	811	723
21	WOMF	312	278	254
22	PWON	620	575	510
23	MTDL	865	1,975	1,580
24	TOWR	690	785	960

Source: Google Finance

The stock price indicated by the *closing price* in this study is the market value. Where market value is the value of shares offered to investors. Knowing the stock price which is the implementation of market value can help investors to find out whether the stock is *undervalued* or *overvalued*.

4.3 Hypothesis Testing and Data
a. Analysis Descriptive
1. Analysis 2018

Table 4. Stock conditions with intrinsic value obtained by the 2018 PER method

No.	Company Code	Share Price (Market Value)	)	Condition
1	PTBA	4300.00	0.00000045	Overvalued
2	FASW	7775.00	0.00000387	Overvalued
3	SMGR	11500.00	0.00000207	Overvalued
4	UNTR	27350.00	0.00000829	Overvalued
5	AALI	11825.00	0.00000633	Overvalued
6	DS00000098	DS00000098	0.000000004	Overvalued
6	Overvalued	PER	(	Value
Intrinsic	JPFA	2150.00	0.00000020	Overvalued
9	PRDA	2280.00	0.00000261	Overvalued
10	SIDO	840.00	0.00000006	Overvalued
11	BBCA	5200.00	0.00000024	Overvalued
12	BBNI	8800.00	0.00000052	Overvalued
13	BBTN	2540.00	0.00000026	Overvalued
14	BDMN	32000020.007	0.000000.35000	Overvalued
_	_	BM	_	Overvalued
_	_	2000017	_	_
_	_	3200002	_	_
BDMN	BNII	206.00	0.00000000	Overvalued
19	MEGA	4900.00	0.00000075	Overvalued
20	SDRA	839.80	0.00000014	Overvalued
21	WOMF	312.00	0.00000010	Overvalued
22	PWON	620.00	0.00000001	Overvalued
23	MTDL	865.00	0.00000039	Overvalued
24	TOWR	690.00	0.00000002	Overvalued

Source: data processed fromcorporate finance 2018

In 2018, there were differences in the results of each method of fundamental analysis. Where the PER analysis states that all company shares are declared *overvalued*, meaning that the intrinsic value or the real value of a share is lower than the market value or the value offered.

Table 5. Stock conditions with intrinsic value obtained using the 2018 DDM method

No.	Company Code	Stock Price (Market Value)	)	Condition
1	PTBA	4300.00	4740.48	Undervalued
2	FASW	7775.00	9595.22	Undervalued
3	SMGR	11500.00	12301.60	Undervalued
4	UNTR	27350.00	30938.84	Undervalued
5	AALI	11825.00	12191.30	Undervalued
6	DSNG450.00	445.40	11	Undervalued
(	Value	DDM	Intrinsic	2018
8	JPFA	2150.00	2342.13	Undervalued
9	PRDA	2280.00	2448.04	Undervalued
10	SIDO	840.00	842.59	Undervalued
11	BBCA	5200.00	5866.30	Undervalued
12	BBNI	8800.00	9617.17	Undervalued
13	BBTN	2540.00	2774.65	Undervalued
14	BDMN	3200.00	7500	Undervalued
15.16.17.19	BMJBR	2050.00	3359.19	Undervalued
_	_	17.0074.65	_	_
_	_	_	_	_
18	BNII	206.00	221.06	Undervalued
19	MEGA	4900.00	5237.51	Undervalued
20	SDRA	839.80	896.11	Undervalued
21	WOMF	312.00	355.58	Undervalued
22	PWON	620.00	711.29	Undervalued
23	MTDL	865.00	952.65	Undervalued
24	TOWR	690.00	775.40	Undervalued

2018 financial statements

Sated that all of the company's shares *undervalued* in 2018, which means the intrinsic value is higher than the market value.

Table 6. Stock conditions with intrinsic value obtained using the DCF 2018

No.	Company Code	Value) 2018	(DCF)	Condition
1	PTBA	4300.00	1612.49	Overvalued
2	FASW	7775.00	-1151.17	Overvalued
3	SMGR	11500.00	234.99	Overvalued
4	UNTR	27350.00	7334.92	Overvalued
5	AALI	11825.00	-2314.30	Overvalued
7	ICBP49	410.00	-749.92	Intrinsic
Value	Market	10450.00	370.76	Overvalued

8	JPFA	2150.00	-42.82	Overvalued
9	PRDA	2280.00	1340.21	Overvalued
10	SIDO	840.00	68.03	Overvalued
11	BBCA	5200.00	4223.23	Overvalued
12	BBNI	8800.00	1890.33	Overvalued
13	BBTN	2540.00	2088.30	Overvalued
_	BDMN	145.00	.	_
_	_	_	_	_
_	_	_	_	_
27	BNGA	915.00	152.14	Overvalued
18	BNII	206.00	-150.30	Overvalued
19	MEGA	4900.00	772.03	Overvalued
20	SDRA	839.80	-506.78	Overvalued
21	WOMF	312.00	-1156.23	Overvalued
22	PWON	620.00	198.01	Overvalued
23	MTDL	865.00	289.60	Overvalued
24	TOWR	.	_	_

_ 2018 company

With DCF analysis in 2018 it actually makes have mixed analysis results. Where the company's shares that are *undervalued* are BDMN shares or company shares of Bank Danamon Indonesia Tbk. Meanwhile, based on the DCF analysis, other stocks were in *overvalued* in 2018.

2. Descriptive Analysis of 2019

Table 7. The condition of stocks with intrinsic value obtained by the 2019 PER method

no.	**Company Code**	**Share Price (Market Value)**	**)**	**Condition**
1	PTBA	2660.00	0.00000024	Overvalued
2	FASW	7700.00	0.00000337	Overvalued
3	SMGR	12000.00	0.00000209	Overvalued
4	UNTR	21525.00	0.00000640	Overvalued
5	AALI	14575.00	0.00000748	Overvalued
6	DSNG	460.00	0.00000004	Overvalued
0.00 0000 04	Overvalued	(	PER	Value
Intri nsic	JPFA	1535.00	0.00000014	Overvalued
9	PRDA	3620.00	0.00000415	Overvalued
10	SIDO	638.00	0.00000002	Overvalued
11	BBCA	6695.00	0.00000030	Overvalued
12	BBNI	7925.00	0.00000046	Overvalued
13	BBTN	2120.00	0.00000020	Overvalued

14	BDMN	3950.00	0.000000000	_
_	_	BR	_	Overvalued
_	_	1250.00	_	_
_	_	BR	_	0.00750001
180.00	BNII	208.00	0.00000000	Overvalued
19	MEGA	6800.00	0.00000105	Overvalued
20	SDRA	810.51	0.00000013	Overvalued
21	WOMF	278.00	0.00000009	Overvalued
22	PWON	575.00	0.00000001	Overvalued
23	MTDL	1975.00	0.00000088	Overvalued
24	TOWR	785.00	0.00000002	Overvalued

Source: data processed from2019 company financial statements

In 2019 the PER analysis stated that all company shares were declared *overvalued*, meaning that the intrinsic value or the real value of a share was lower than the market value or offered value.

Table 8. Stock conditions with intrinsic value obtained by the DDM method

No.	Company Code	Stock Price (Market Value) 2019	Intrinsic Value (DDM)	Condition
1	PTBA	2660.00	2701.72	Undervalued
2	FASW	7700.00	8354.58	Undervalued
3	SMGR	12000.00	12410.90	Undervalued
4	UNTR	21525.00	23886.02	Undervalued
5	AALI	14575.00	14406.07	Overvalued
6	DSNG150.00ed	488.29	125	Undervalued
11	469.29	125	11	Undervalued
8	JPFA	1535.00	1680.40	Undervalued
9	PRDA	3620.00	3887.28	Undervalued
10	SIDO	638.00	672.90	Undervalued
11	BBCA	6695.00	7456.70	Undervalued
12	BBNI	7925.00	8662.36	Undervalued
13	BBTN	2120.00	2088.66	Overvalued
14	BDMN	3950.00	4146.49	Undervalued
BMJRI	125750.00	135.00	1320	_
_	_	_	_	_
_	_	_	.	_
18	BNII	208.00	218.43	Undervalued
19	MEGA	6800.00	7326.40	Undervalued
20	SDRA	810.51	857.38	Undervalued
21	WOMF	278.00	318.21	Undervalued

22	PWON	575.00	650.72	Undervalued
23	MTDL	1975.00	2166.92	Undervalued
24	TOWR	785.00	888.48	Undervalued

from company financial reports

The data measurement of intrinsic value with the 2019 DDM analysis states that there are 2 stocks that are in an *overvalued*, namely AALI (Astra Agro Lestari Tbk.) and BBTN (State Savings Bank (Persero) Tbk.) shares. Meanwhile, the shares of other companies are *undervalued* in 2019, which means that the intrinsic value is higher than the market value.

Table 9. Stock conditions with intrinsic value obtained by the DCF method

no.	**Company Code**	**Stock Price (Market Value) 2019**	**DCF)**	**Condition**
1	PTBA	2660.00	4733.75	Undervalued
2	FASW	7700.00	-30592.02	Overvalued
3	SMGR	12000.00	6851.16	Overvalued
4	UNTR	21525.00	1148.42	Overvalued
5	AALI	14575.00	-2755.65	Overvalued
7	ICBP87	460.00	-572.65	Value
Intrinsi c	(	7150.00	8398.24	Overvalued
8	JPFA	1535.00	-165.22	Overvalued
9	PRDA	3620.00	538.33	Overvalued
10	SIDO	638.00	82.23	Overvalued
11	BBCA	6695.00	9302.11	Undervalued
12	BBNI	7925.00	-724.67	Overvalued
13	BBTN	2120.00	716.21	Overvalued
14	3046.14950.00	_	_	_
_	_	_	_	_
_	_	_	11616.32	Undervalued
17	BNGA	985.00	1216.57	Undervalued
18	BNII	208.00	166.49	Overvalued
19	MEGA	6800.00	3478.92	Overvalued
20	SDRA	810.51	-327.90	Overvalued
21	WOMF	278.00	-1603.60	Overvalued
22	PWON	575.00	-65.52	Overvalued
MTO WR	273.88	23.88	273.60	Overvalued
785.00	1975.00	_	_	_

Data from the company's 2019 financial statements.

With DCF analysis there are 4 (four) company shares that are *undervalued* are PTBA (Bukit Asam Tbk.), BBCA (Bank Central Asia Tbk.), BMRI (Bank Mandiri (Persero) Tbk.), and BNGA (Bank CIMB Niaga Tbk.). Meanwhile, based on the 2019 DCF analysis, other stocks are in an *overvalued* where the intrinsic value is lower than the market value.

3. 2020 Descriptive Analysis

Table 10. The condition of shares with intrinsic value obtained by the PER method

no.	Company Code	Share Price (Market Value)	PER)	Condition
1	PTBA	2810.00	0.00000023	Overvalued
2	FASW	7475.00	0.00000295	Overvalued
3	SMGR	12425.00	0.00000224	Overvalued
4	UNTR	26600.00	0.00000740	Overvalued
5	AALI	12325.00	0.00000662	Overvalued
6	DSGR00000	610.00	0.00000000	Overvalued
98957	Overvalued	0.000000	Value	(
Intrinsic	JPFA	1465.00	0.00000013	Overvalued
9	PRDA	3250.00	0.00000378	Overvalued
10	SIDO	805.00	0.00000003	Overvalued
11	BBCA	6770.00	0.00000029	Overvalued
12	BBNI	6175.00	0.00000033	Overvalued
13	BBTN	1725.00	0.00000018	Overvalued
14	BDMN	7550.005	0.000000	Overvalued
_	_	15000000	0.000000	.
_	_	7550.005	_	_
_	_	_	_	_
JBR	BNII	346.00	0.00000000	Overvalued
19	MEGA	7200.00	0.000000115	Overvalued
20	SDRA	722.62	0.00000012	Overvalued
21	WOMF	254.00	0.00000007	Overvalued
22	PWON	510.00	0.00000001	Overvalued
23	MTDL	1580.00	0.00000070	Overvalued
24	TOWR	960.00	0.00000002	Overvalued

Source: data processed from reported 2020 company finances

In 2020 the PER analysis stated that all company shares were declared *overvalued*, meaning that the intrinsic value or true value of a share was lower than the market value or offered value.

Table 11. The condition of shares with intrinsic value obtained by the DDM method

No.	Kode Perusahaan	Harga Saham (Nilai Pasar) 2020	Nilai Intrinsik (DDM)	Kondisi
1	PTBA	2810.00	2600.26	Overvalued
2	FASW	7475.00	7307.60	Overvalued
3	SMGR	12425.00	13314.74	Undervalued
4	UNTR	26600.00	27595.69	Undervalued
5	AALI	12325.00	12746.31	Undervalued
6	DSNG	610.00	651.54	Undervalued
7	ICBP	9575.00	10351.30	Undervalued
8	JPFA	1465.00	1549.51	Undervalued
9	PRDA	3250.00	3547.35	Undervalued
10	SIDO	805.00	844.99	Undervalued
11	BBCA	6770.00	7264.68	Undervalued
12	BBNI	6175.00	6144.05	Overvalued
13	BBTN	1725.00	1861.48	Undervalued
14	BDMN	7550.00	7392.58	Overvalued
15	BJBR	1550.00	1648.40	Undervalued
16	BMRI	6325.00	6345.56	Undervalued
17	BNGA	995.00	1010.03	Undervalued
18	BNII	346.00	357.41	Undervalued
19	MEGA	7200.00	7993.61	Undervalued
20	SDRA	722.62	767.39	Undervalued
21	WOMF	254.00	249.83	Overvalued
22	PWON	510.00	536.95	Undervalued
23	MTDL	1580.00	1711.33	Undervalued
24	TOWR	960.00	1116.66	Undervalued

Source: data processed from the company's 2020 financial statements

Meanwhile, the 2020 DDM analysis stated that there were 5 (five) stocks that were in an *overvalued*, namely PTBA (Bukit Asam Tbk.), FASW (Fajar Surya Wisesa Tbk.), BBNI shares (Bank Negara Indonesia (Persero) Tbk.), BDMN (Bank Danamon Indonesia Tbk.), and WOMF (Wahana Ottomitra Multiartha Tbk.). Meanwhile, the shares of other companies are *undervalued* in 2020, which means that the intrinsic value is higher than the market value.

Table 12. Stock conditions with intrinsic value obtained by the DCF

No.	Company Code	Stock Price (Market Value) 2020	Intrinsic Value (DCF	Condition
1	PTBA	2810.00	776.62	Overvalued
2	FASW	7475.00	-2148.45	Overvalued
3	SMGR	12425.00	310032.37	Undervalued
4	UNTR	26600.00	6929.30	Overvalued

5	AALI	12325.00	-275.18	Overvalued
6	DSNG	610.00	-275.18	Overvalued
7	)	9575.00	-16618.32	Overvalued
8	JPFA	1465.00	175.55	Overvalued
9	PRDA	3250.00	-2307.32	Overvalued
10	SIDO	805.00	216.92	Overvalued
11	BBCA	6770.00	-64732.36	Overvalued
12	BBNI	6175.00	9055.59	Undervalued
13	BBTN	1725.00	11678.49	_
_	7555.00	11678.49	_	_
_	_	_	_	_
_	_	755	.	Undervalued
17	BNGA	995.00	4622.42	Undervalued
18	BNII	346.00	560.31	Undervalued
19	MEGA	7200.00	8.86	Overvalued
20	SDRA	722.62	-116.57	Overvalued
21	WOMF	254.00	567.43	Undervalued
22	PWON	510.00	91.12	Overvalued
23	MTDL	1580.00	7071.92	Undervalued
24	TOWR	960.00	-63.70	:

Data processed from financial report2020 company

With DCF analysis 2020 me state that there are 8 (eight) company shares that are *undervalued* shares of SMGR (Semen Indonesia (Persero) Tbk.), BBNI (Bank Negara Indonesia (Persero) Tbk.), BBTN (Bank Tabungan Negara (Persero) Tbk.), BMRI (Bank Mandiri (Persero) Tbk.), BNGA (Bank CIMB Niaga Tbk.), BNII (Bank Maybank Indonesia Tbk.), WOMF (Wahana Ottomitra Multiartha Tbk.), and MTDL (Metrodata Electronics Tbk.). Meanwhile, based on the 2020 DCF analysis, other stocks are in an *overvalued* where the intrinsic value is lower than the market value.

b. Analysis Root Mean Square Error (RMSE)

Table 13. Analysis for methods

RMSE	period		
	2018	**2019**	**2020**
PER	7708.24	7270.69	7709.82
DDM	909.06	653.02	393.06
DCF	7376.83	19331.91	63025.31

Source: data processed

Based on the results of the RMSE calculation for all companies that were the research sample, showing the smallest value in 2018-2019 is the RMSE value of the DDM method. Where it shows that the DCF method is more accurately used to measure the intrinsic value of shares compared to the PER method, which is shown by the RMSE DCF value being smaller than the RMSE PER value. This supports previous research which

states that the DCF method is more accurate than the PER method in measuring the intrinsic value of shares (Darmawan & Budiman, 2016). While the DDM method is the most accurate method for analyzing the intrinsic value of shares, it is shown by the RMSE DDM value which is the smallest compared to the RMSE PER value and the RMSE DCF value. The results of this study do not support the results of previous studies which stated that the measurement of intrinsic value using the PER method was more accurate than the DDM method (Natalia et al., 2019).

c. Analysis RMSE of companies experiencing different stock price conditions 2018-2020

Table 14. RMSE of companies with different conditions of stock price changes in 2018-2020

Description	Analysis Results		
	PER	**DDM**	**DCF**
Stock prices increased significantly 2018-2020	6239.59	463.35	108274.54 Stock
prices decreased significantly 2018- 2020	3535.09	84.78	5032.66
Stock prices fluctuate in 2018-2020	11250.89	489.34	12776.73 Stock
prices increase in 2020	9264.48	479.95	88590.67 Stock
prices decline in 2020	5749.10	280.44	9772.73

Source: processed data

RMSE analysis based on differences in conditions of stock price changes aims to find out if there are any differences in RMSE results which can indicate whether the method with the lowest RMSE value has different results depending on the condition of changes in share prices. In this study, reviewing the conditions of changes in stock prices which are grouped into 5 (five) conditions. The fifth condition states that when stock prices increase or decrease, the lowest RMSE calculation results come from fundamental analysis using the DDM method.

4.4 Discussion

a. With the PER method, they are overvalued and more undervalued.

The results of this study are different from the results of previous studies which state that stock conditions with general PER analysis are *undervalued* (Darmawan & Budiman, 2016; Natalia et al., 2019). However, this study supports previous research which says that the results of stock price assessments in the mining sector using the PER method show *overvalued* (Azizah, 2019). Shares that are assessed using the PER method and have *overvalued* can be caused because the dividend value per share obtained is smaller than the market value. This is because the dividend per share represents the return given to investors in the form of investors. However, investors can choose stocks with a PER value below 1 or lower than the PER of other shares. The smaller the PER value, the better the stock, because stocks with a smaller PER indicate the level of dividends distributed meet or match the expected rate of *return*.

b. With the DDM method, there are more undervalued stocks than overvalued stocks.

Company shares are *undervalued* more than *overvalued*. Where in 2018 all stocks whose intrinsic value was measured by the DDM method showed that all of them were undervalued. This supports previous research where the results of measuring intrinsic value using the DDM method show that stock prices are generally *undervalued* (Darmawan & Budiman, 2016; Natalia et al., 2019). However, this study does not support previous research on stocks on the IDX in the food and beverage sub sector which stated that with the DDM method the dominant stock was *correctly valued* (Herawanny, 2017). Dividend growth (*growth*) can cause stocks to be overvalued. Because when the stock is overvalued, it means that the market value is higher than the intrinsic value or actual value. In 2019 and 2020, *overvalued* experienced negative dividend growth or declining growth, while the value of these shares in the market was still quite high compared to their intrinsic value. Therefore, it can cause some stocks in 2019 and 2020 to be overvalued. Investors can decide to sell shares that are *overvalued*. Meanwhile, with stocks that are *undervalued*, investors can make decisions to buy shares.

c. With the DCF method, there are more undervalued stocks than overvalued stocks.

Company stocks *overvalued* there are more *undervalued*. This supports previous research where the results of measuring intrinsic value using the DCF method show stock price conditions that are generally *overvalued* (Darmawan & Budiman, 2016). Similar to the DDM method, with the DCF method, if the stock is overvalued, the investor can sell the stock, or if the stock is *undervalued*, the investor can buy the stock. However, it should be noted that DCF estimates growth in the next 10 years with an assumed growth rate. Meanwhile, in the next 10 years, economic conditions may change, such as in 2020. So, the intrinsic value seen by the DCF method may differ depending on the calculation assumptions.

V. Conclusion

In this study, the variables of the PER, DDM, and DCF measurement methods were used as the measurement of intrinsic value. The results of the RMSE analysis show that DDM is the most accurate measurement method for measuring the intrinsic value of shares. The results of the descriptive analysis of intrinsic value as measured by the DDM method show that in general the stock is undervalued, which means that the intrinsic value is higher than the market value. It is hoped that further research can add other intrinsic value measurement variables, and can add years of research to further clarify which method of measuring intrinsic value is the most accurate. In addition, further research can use PER, DDM, and DCF as variables to see whether the three stock valuation methods affect stock performance and investors' decisions to buy shares or not.

References

Audini, M. (2018). Analisis Penilaian Harga Saham Dengan Menggunakan PBV, FCFF Dan FCFE Pada Subsektor Tourism, Restaurant, dan Hotel Yang Terdaftar Di Bursa Efek Indonesia Periode 2015-2017. Sains Manajemen Dan Kewirausahaan, 2(2), 102–106.

Azizah, DF (2019). Analisis Fundamental Dengan Pendekatan Price Earning Ratio (Per) Untuk Menilai Kewajaran Harga Saham Sebagai Dasar Pengambilan Keputusan Investasi (Studi Pada Perusahaan Pertambangan Yang Tercatat Di Bursa Efek

Indonesia Tahun. 73(1), 132–140.
Brigham, EF, & Houston, JF (2019). Fundamentals of Financial Management 15 Edition. Cengage Learning.
Carl, S. (2019). Prediction of Stock Prices using Financial Analysis. IJISET-International Journal of Innovative Science, Engineering & Technology, 6(12), 8–19. www.ijiset.com
Darmawan, A., & Budiman, R. (2016). Analisis Fundamental Harga Saham Perusahaan dengan Menggunakan Metode Discounted Cash Flow dan Price Earning (Studi Pada Perusahaan Multinasional Yang Menjadi Anggota Indeks Sektor Properti di BEI Periode 2012-2016). Jurnal Administrasi Bisnis S1 Universitas Brawijaya, 63(1), 122–129.
Febriana, MS, Pinem, DB, & Fadila, A. (2020). Analisis Faktor-Faktor yang Mempengaruhi Nilai Perusahaan (Studi Empiris pada Perusahaan Pertambangan yang Terdaftar di Bursa Efek Indonesia). Jurnal Apresiasi Ekonomi, 8(2), 185–196.
Hasanah, R., & Rusliati, E. (2017). Harga Saham Dengan Metode Dividend Discount Model Dan Price To Book Value. Jurnal Riset Bisnis Dan Manajemen, 10(2), 1. https://doi.org/10.23969/jrbm.v10i2.446
Herawanny, CA (2017). Analisis Dividend Discount Model Pertumbuhan Konstan Sebagai Keputusan Investasi Saham (Studi pada Perusahaan Sub Sektor Makanan & Minuman yang Terdaftar di Bursa Efek Indonesia Tahun 2013-2015). 46(1), 147–155.
Islami, RG (2020). Valuasi Nilai Wajar Saham dengan Metode DCF (Discounted Cash Flow) dalam Pengambilan Keputusan Investasi pada Perusahaan Pertambangan Tahun 2015 – 2019. Jurnal Mahasiswa USM: Pasar Modal, 1(1), 1–15.
Masruri Zaimsyah, A. (2019). Analisis Fundamental Terhadap Harga Saham yang Terdaftar di Jakarta Islamic Index Tahun 2010-2017. Jurnal Ilmiah Ekonomi Islam, 5(2), 113–119. https://doi.org/10.29040/jiei.v5i2.517
Natalia, D., ER, CW, & Yulita, IK (2019). Stock Valuation Analysis Using The Dividend Discount Model, Price Earning Ratio And Price To Book Value For Investmen Decisions. Jurnal Ilmiah Manajemen, 7(3), 276–285.
Ningrum, NRW, Kirana, DJ, & Miftah, M. (2021). Pengaruh pengungkapan sustainability report , asimetri informasi, dan kinerja keuangan terhadap nilai perusahaan 1). Jurnal Penelitian Akuntansi, 2(1), 42–57.
Ningrum, P. A., et al. (2020). The Potential of Poverty in the City of Palangka Raya: Study SMIs Affected Pandemic Covid 19. Budapest International Research and Critics Institute-Journal (BIRCI-Journal) Volume 3, No 3, Page: 1626-1634
Öztürk, H. (2017). The Relationship Between Earnings-to-Price, Current Ratio, Profit Margin and Return: An Empirical Analysis on Istanbul Stock Exchange. Accounting and Finance Research, 7(1), 109. https://doi.org/10.5430/afr.v7n1p109
Putra, T. (2020). Kalahkan Asing, Lokal Kuasai Kepemilikan Saham di Bursa RI. CNBC Indonesia. https://www.cnbcindonesia.com/market/20200717114920-17-173502/kalahkan-asing-lokal-kuasai-kepemilikan-saham-di-bursa-ri
Safitri, K., Mertha, IM, Gusti, N., Wirawati, P., & Dewi, A. (2020). The Impact of Debt to Equity Ratio, Price Earning Ratio, Earning Per Share to The Stock Price On Banking Sectors Listed In INFOBANK15 index 2014-2018. American Journal of Humanities and Social Sciences Research (AJHSSR), 4(5), 49–56.
Saleh, A., Mujahiddin. (2020). Challenges and Opportunities for Community Empowerment Practices in Indonesia during the Covid-19 Pandemic through Strengthening the Role of Higher Education. Budapest International Research and

Critics Institute-Journal (BIRCI-Journal). Volume 3, No 2, Page: 1105-1113.
Sidik, S. (2021). No Title. CNBC Indonesia. https://www.cnbcindonesia.com/market/20210125150721-17-218547/resmi-mulai-hari-ini-bei-kelompokkan-emiten-di-12-sektor
Sihombing, E. H., Nasib. (2020). The Decision of Choosing Course in the Era of Covid 19 through the Telemarketing Program, Personal Selling and College Image. Budapest International Research and Critics Institute-Journal (BIRCI-Journal) Volume 3, No. 4, Page: 2843-2850.
Wildatunjanah, ES, & Suparningsih, B. (2019). The Effect of Debt to Equity Ratio and Pricer Earning Ratio on Stock Price with Moderating as BI Rate Variable in Retail Sector Companies Listed in Indonesia Stock Exchange (IDX). East African Scholars Journal of Economics, Business and Management, 2(6), 307-317 ISSN 2617-4464. https://doi.org/10.36349/easjebm.2019.v02i06.006