FAIR PRICE VALUATION OF STOCKS USING DIVIDEND DISCOUNT MODEL METHOD AND PRICE TO BOOK VALUE RATIO
(Empirical Study on Property and Real Estate Sub-Sector Companies Listed on Indonesia Stock Exchange in 2016-2019)

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Abstract *- Stock valuations are used to compare between fair value and stock market value, which will eventually serve as the basis for investment decisions on whether investors will sell or buy shares.. This research aims to analyze the fair value of companies using the Dividend Discount Model (DDM) and Price to Book Value (PBV) methods of property and real estate companies on the Indonesia Stock Exchange. The research period starts from 2016-2019. The sample is selected by the criteria of the company that distributes the dividend. The methods used are descriptive and quantitative as well as measuring accuracy with root mean squared error (RMSE). The results showed that the stock market value of property and real estate companies in 2016-2019 averaged 11 companies undervalued. The results of this study also show that the DDM method is the most accurate method because the average value of RMSE DDM is smaller than the average value of RMSE PBV. This DDM method is more suitable for companies with consistent growth and at the maturity stage and always distribute dividends. The PBV method would be better to assess the company's shares with similar industries or sectors, so it is clear the stock comparison is either overvalued or undervalued.*

Keywords**:** *Fair value, Dividend Discount Model, Price to Book Value, Stock Valuation*

I. INTRODUCTION

The development of the property and real estate sector is very attractive to investors due to the increase in land and building prices that tend to rise, the supply of land is fixed while the demand will always increase in line with the increasing population and the increasing human need for housing, offices, shopping centers, and others. In developed and developing countries, property and real estate development and businesses are experiencing rapid growth, this is also the case in Indonesia (Kalsum et al 2020)

Investment is a commitment to a number of funds or sources of funds made at this time with the aim of making future profits (Tandelilin, 2017). An investor has motivation in investing stocks is to make a profit, both in the form of capital gains and dividends. In investing is not independent of risk therefore investing stocks is not separated from the characteristics of the relationship between return and risk. One of the risks investors have to face is *mispriced* or mispriced.

According to Brigham and Houston (2010) stock valuations can be done by investors to minimize those risks. Stock valuations are conducted to determine the true value or intrinsic value of a stock. The fair value provides a measure of the base value of a stock and is standard to know if the stock is*undervalued,fair*or*overvalued.*).

Given these risks, investors should be able to take into account by conducting an in-depth assessment of the stocks to be purchased. Stock valuations can be done using fundamental analysis. Fundamental analysis is widely used to determine the fairness of the share price because this analysis is based on a presumption that each stock has a fair value reflected by the fundamental factors that affect it. These fundamental factors can come from within the company (issuer), industry or macroeconomic state, so that from the fundamental analysis can be known whether the stock market price is a reasonable share price (Wira, 2014)

Stock valuations are known to have three types of value namely book value, market value and fair value of shares (Bodie, et.al 2014). Market value is the value that the exchange market occurs on the demand and supply of market participants. The market value used is the closing price at the end of the year. The fair value of a stock is the actual or supposed value of the stock. Investors are interested in knowing the fair value of a company and then comparing fair value with the stock market value if they want to make a sell and buy stock transaction.

Fundamental analysis and technical analysis can be used to perform stock valuations (Hartono, 2017). Technical analysis is done by looking at historical stock price data to predict share price movements. Meanwhile, fundamental analysis calculates the fair value of a stock using the company's financial data. For fundamental analysis there are two approaches to calculating the value of stocks, *namely with the present value approach* and the PER*(P/E ratio approach).* One of the models of determining the value of stocks (current value approach) by using the dividend component is DDM (*Dividend Discount Model)*. DDM is a model for determining estimated share prices by discounting all dividend flows that will be received in the future (Tandelilin, 2017).

According to Tandelilin (2017) the relationship between the stock market price and the book value per share may also be used as an alternative approach to determining the value of a stock, since theoretically the market value of a stock should reflect its book value. Basically the *Dividend Discount Model method is* different from the price to book *value.* The DDM method is an assessment of fair value while the PBV method is an assessment of the book value. Based on the calculation results proven to be a difference in the fair *value of the Dividend Discount Model* method and price to book *value* resulting in different share price conditions from each company.

Fair value with *Dividend Discount Model method tends* to follow the market price (closing*price)*compared to the fair *value of the price to book value method* that tends to avoid closing *price.* The difference lies in *the valuation of the Dividend Discount Model* which calculates fair value by discounting cash flow to forecast the dividends that investors expect. This method is suitable for stable, established companies and always pays dividends while *price to book value calculates* the book value on the equity shown on the balance sheet. The main thing that is the calculation element *of the Dividend Discount Model* method is dividends while the Price To Book Value *method* does not look at cash flow because this method can also be used in companies with negative cash flow conditions (Hasanah and Rusliati, 2017).

According to Hasanah and Ruslianti (2017) the difference in yield will raise questions for investors so it is difficult to make a decision, so further analysis is needed to know the stock valuation model that provides the most accurate results in conducting a fair price valuation of the stock. In addition to assessing the share price to find out which shares are reasonable to buy or sell, investors need to measure the accuracy of the methods used. Therefore the comparison analysis of the accuracy of the stock fair price assessment model is done *with Root Mean Square Error* (RMSE).

II. LITELATUR STUDY

2.1. Capital Markets

The capital market is a long-term securities market where with maturities of more than 1 year, such as stocks and bonds are bought and sold (Gitman, 2017). According to Keown (2017) all institutions and procedures that facilitate transactions in long-term financial instruments.

2.2. Capital Market Instruments

According to Eduardus Tandelilin (2017) capital market instruments in a practical context are more commonly known as securities. *Securities* ,or also called securities or securities are*financial assets that*state financial claims.

2.3. Investment

According to Gitman (2017) Investing is any asset that with funds can be expected that it will generate positive income and or preserve or increase its value.

2.4. Shares

According to Keown (2017) shares are evidence representing ownership in a company.. According to Tandelilin (2017) the shares state ownership of a company. Shares are certificates that

show proof of ownership of a company. If an investor owns 1 million shares of a company's total common stock of 100 million shares, then he owns 1% of the company.

2.5. Share Price

According to Brigham and Houston (2010) the share price determines shareholder wealth. Maximization of shareholder wealth translates into maximizing the company's share price. The share price at any given time will depend on the cash flow expected to be received in the future by the "average" investor if the investor buys the shares.

2.6. Stock Valuation

According to Eduardus Tandelilin (2017) in stock valuation is known for three types of value, namely:

1. Book Value
   Book Value is a value calculated based on the bookkeeping of the issuing company (issuer).
2. Market Value
   The Market Value is the value of the stock in the market, which is indicated by the price of the stock in the market.
3. Fair Value
   Fair Value or known as theoretical value is the actual or supposed value of the stock.

2.7. Dividend Discount Model

Dividend Dicount Model is one of the methods of testing stock analysis based on present value approach. This test estimates the share price by discounting all dividend flows that will be received in the future. This method of testing analysis is divided into three test models with each having different assumptions, including Dividend Discount Zero Growth Model, Dividend Discount Model Constant Growth and Dividend Discount Model Of Un constant growth (double). Here are the assumptions of the three DDM models:

1. Zero Growth Model Discount Dividend (Tandelilin, 2017)

$$\hat{P}_0 = \frac{D_0}{k} \qquad (1)$$

Description:
$\hat{P}_0$ = Fair Value of shares with dividend discount model
D_0 = Dividends to be received in constant amounts during the future dividend payment period
k = investor required return rate

2. Dividend Discount Growth Model Not Constant (Tandelilin, 2017)

$$P_0 = \frac{D_1}{k-g} \qquad (2)$$

Description
P_0 = Fair Value of shares
D_1 = Expected dividend in one more year
k = investor required return rate

g = expected dividend growth

2.8. Price to Book Value (PBV Ratio)

Price book value ratio is the market value of part of a company's shares divided by the book value per share of the company in reporting equity in the balance sheet report (Keown, 2017). According to Harmono (2014), the high price book value reflects the high share price compared to the book value of the share. The higher the share price the more successful the company creates value for shareholders. Mathematically Price to Book Value (PBV) can be formulated as follows: (Tandelilin, 2017)

Price Book Value Ratio = (Stock Market Price)/(Book Value Per Share)

2.9. Root Mean Square Error

Root mean square error is a measure of the difference between a known value and a predicted value. This method is also known as root mean squared deviation (RMSD). As can be predicted from the name, RMSE or RMSD is calculated by predicted (observed) divided by the amount of data (= average), then rooted. The smaller the RMSE value, the more accurate the assessment results. Mathematically, the formula is written as follows: (James, et al 2013)

$$RMSE = \sqrt{\frac{1}{n}RSS} \qquad (3)$$

The truth can also be seen as

$$RMSE = \sqrt{\frac{1}{n}\sum_{i=1}^{n}(Y_i - \hat{Y}_i)^2} \qquad (4)$$

Description:
$\hat{Y}$i = predicted value
Yi = observed value
n = amount of data

III. RESEARCH METHODS

Researchers conducted this study using a descriptive research method with a quantitative approach. This type of research using descriptive methods does not conduct hypothetical testing. This method is more suitable and able to answer the problems studied. This research method is expected to provide research results and answers can be given clearly.

According to Sugiyono (2013) the population is a generational region consisting of objects or subjects that have certain qualities and characteristics set by researchers to study and then draw conclusions. The population in this study is a sub-sector property and real estate company that has been recorded in IDX in 2016.

The sample was conducted by taking stock data of the property and real estate sub-sectors in 2016-2019 listed on the Indonesia Stock Exchange. The sampling techniques in this study used *purposive sampling methods. Purposive sampling method is* a method of determining samples based on certain criteria. The criteria used for sampling by researchers are as follows:

1. Property and Real Estate Sector Companies that go public or registered with IDX and issue financial statements everys as of December 31 during the observation period (2016-2019).
2. Make regular dividend payments annually during the observation period (2016-2019).

Based on the above criteria, there are 11 businesses that fit the sample criteria including:

Table 1. Companies that meet the sample criteria

No.	Sample Company	Code
1.	PT Bekasi Fajar Industrial Estate Tbk	BEST
2.	PT Ciputra Development Tbk	CTRA
3.	PT Puradelta Lestari Tbk	DMAS
4.	PT Gowa Makassar Turism Development Tbk	GMTD
5.	PT Perdana Gapura Prima Tbk	GPRA
6.	PT Metropolitan Kentjana Tbk	MKPI
7.	PT Pembangunan Perumahaan Properti Tbk	PPRO
8.	PT Pudjiadi Prestige Tbk	PUDP
9.	PT Pakuwon Jati Tbk	PWON
10.	PT Roda Vivatex Tbk	RDTX
11.	PT Sumarecon Agung Tbk	SMRA

Source : processed data (2020)

Several factors to note in calculating stock valuation using Dividend Discount Model:

1. Calculating dividend growth rate (Tandelilin, 2017)

$$g = ROE \times (1 - DPR) \qquad (5)$$

Description:
ROE : Return On Equity
DPR : Dividend Payout Ratio

2. Calculate the expected rate of return (k) (Brigham, 2018)

$$k = \frac{D_0}{P_0} + g \qquad (6)$$

Description:
D_0 : Current dividend
P_0 : Current stock market price
g : Expected dividend growth

3. Calculating the expected dividend estimate (Ross, 2010)

$$D_1 = D_0 (1 + g) \qquad (7)$$

Description:
D_1 = Dividend expected for the next year
D_0 = Dividends last distributed

g = Expected dividend growth

4. Calculating fair value (Tandelilin, 2017)

$$P_0 = \frac{D_1}{k-g} \qquad (8)$$

Keterangan:
P_0= Fair Value of shares
D_1= Expected dividend in one more year
k = Expected dividend in one more year
g = Expected dividend growth

IV. RESEARCH RESULTS AND DISCUSSIONS

Table 2. Property and Real Estate Company ROE Data 2016-2019

Return On Equity (%)				
Code	**2016**	**2017**	**2018**	**2019**
BEST	9.92%	12.56%	10%	8.53%
CTRA	8.00%	6.70%	8.20%	7.23%
DMAS	10.25%	9.38%	6.90%	20.56%
GMTD	13.60%	9.70%	8.00%	10.16%
GPRA	4.65%	3.61%	4.66%	4.88%
MKPI	32.29%	26.22%	19.47%	11.17%
PPRO	12.31%	9.43%	8.54%	5.89%
PUDP	6.96%	1.80%	1.69%	1.27%
PWON	16.16%	15.83%	18.50%	17.90%
RDTX	14.22%	12.02%	11.60%	9.22%
SMRA	7.00%	6.00%	8.00%	6.49%
Average	**0.12**	**0.10**	**0.10**	**0.09**
Minimum	**0.05**	**0.02**	**0.02**	**0.01**
Maximum	**0.32**	**0.26**	**0.19**	**0.21**

Source : processed data (2020)

Table 3. DPS Property and Real Estate Company Data 2016-2019

Dividen per Share				
Code	**2016**	**2017**	**2018**	**2019**
BEST	3.4	10.0	8.8	8.8
CTRA	6.0	4.8	9.5	10.0
DMAS	15.0	13.0	6.5	21.0
GMTD	45.0	25.0	16.0	20.0
GPRA	5.0	3.0	1.0	1.0
MKPI	327.0	369.0	369.0	369.0
PPRO	4.3	1.3	1.4	1.5
PUDP	11.0	3.0	1.0	1.0
PWON	4.5	4.5	6.0	7.0
RDTX	75.0	90.0	55.0	90.0
SMRA	5.0	5.0	5.0	5.0
Average	**45.6**	**48.1**	**43.6**	**48.6**
Minimum	**3.4**	**1.3**	**1.0**	**1.0**
Maximum	**327.0**	**369.0**	**369.0**	**369.0**

Source : processed data (2020)

Table 4. DPR Property and Real Estate Company Data 2016-2019

Dividend Payout Ratio(%)				
Code	**2016**	**2017**	**2018**	**2019**
BEST	0.10	0.20	0.20	0.22
CTRA	0.11	0.10	0.15	0.16
DMAS	0.95	0.95	0.63	0.76
GMTD	0.05	0.04	0.03	0.03
GPRA	0.49	0.40	0.12	0.09
MKPI	0.26	0.29	0.34	0.56
PPRO	0.14	0.16	0.17	0.26
PUDP	0.16	0.16	0.06	0.08
PWON	0.13	0.12	0.11	0.12
RDTX	0.08	0.10	0.06	0.10

SMRA	0.23	0.20	0.16	0.14
Average	**0.25**	**0.25**	**0.18**	**0.23**
Minimum	**0.05**	**0.04**	**0.03**	**0.03**
Maximum	**0.95**	**0.95**	**0.63**	**0.76**

Source : processed data (2020)

Table 5. Fair Value with DDM Approach

Fair Value				
Code	**2016**	**2017**	**2018**	**2019**
BEST	364	275	225	230
CTRA	1,414	1,257	1,081	1,103
DMAS	239	172	163	311
GMTD	7,846	11,125	16,168	17,579
GPRA	217	105	115	79
MKPI	31,901	43,248	25,393	16,992
PPRO	351	204	125	71
PUDP	402	457	488	304
PWON	639	781	722	659
RDTX	11,312	6,651	6,103	6,009
SMRA	1,391	990	859	1,061

Source : processed data (2020)

Table 6. Fair Value with PBV Approach

Fair Value				
Code	**2016**	**2017**	**2018**	**2019**
BEST	580	614	791	936
CTRA	1.529	1.282	1.641	1.933
DMAS	253	224	273	272
GMTD	10.380	10.675	11.512	13.730
GPRA	390	372	463	535
MKPI	5.525	7.392	10.097	11.725
PPRO	351	125	173	201
PUDP	1.650	1.564	1.878	2.091
PWON	378	409	582	759
RDTX	11.224	11.773	15.750	18.973
SMRA	934	892	1.149	1.323

Source : processed data (2020)

Tabel 7. Comparison of Closing Price with Fair Value *Dividend Discount Model*

Issuer	Stock Conditions			
	2016	2017	2018	2019
BEST	Undevalued	Undevalued	Undevalued	Undevalued
CTRA	Undevalued	Undevalued	Undevalued	Undevalued
DMAS	Undevalued	Undevalued	Undevalued	Undevalued
GMTD	Undevalued	Undevalued	Undevalued	Undevalued
GPRA	Undevalued	Undevalued	Undevalued	Undevalued
MKPI	Undevalued	Undevalued	Undevalued	Undevalued
PPRO	Undevalued	Undevalued	Undevalued	Undevalued
PUDP	Undevalued	Undevalued	Undevalued	Undevalued
PWON	Undevalued	Undevalued	Undevalued	Undevalued
RDTX	Undevalued	Undevalued	Undevalued	Undevalued
SMRA	Undevalued	Undevalued	Undevalued	Undevalued

Source : processed data (2020)

Tabel 8. Perbandingan Closing Price dengan Nilai Wajar *Price to Book Value Ratio*

Issuer	Stock Conditions			
	2016	2017	2018	2019
BEST	Undervalued	Undervalued	Undervalued	Undervalued
CTRA	Undervalued	Undervalued	Undervalued	Undervalued
DMAS	Undervalued	Undervalued	Undervalued	Overvalued
GMTD	Undervalued	Undervalued	Overvalued	Overvalued
GPRA	Undervalued	Undervalued	Undervalued	Undervalued
MKPI	Overvalued	Overvalued	Overvalued	Overvalued
PPRO	Undervalued	Overvalued	Undervalued	Undervalued
PUDP	Undervalued	Undervalued	Undervalued	Undervalued
PWON	Overvalued	Overvalued	Overvalued	Overvalued
RDTX	Undervalued	Undervalued	Undervalued	Undervalued
SMRA	Overvalued	Overvalued	Overvalued	Overvalued

Source : processed data (2020)

Tabel 9. *Root Mean Square Error* (RMSE) Value

Approach	***Root Mean Square Error* (Rp)**			
	2016	**2017**	**2018**	**2019**
DDM	1.916,13	2.064,51	958,88	551,38
PBV	6.210,35	8.956,31	4.991,00	4.371,82

Source : processed data (2020)

V. SUMMATIONS AND SUGGESTIONS

5.1. Summation

Based on the results of the research that has been tested, it can be concluded as follows:

1. Fair value as the present value of all cash payments to investors, including dividends as well as the proceeds of the main sale of shares. A company's fair value as the current value of future dividend expectations is discounted at a risk-adjusted rate of return.

2. The share price of property and real estate companies assessed using the Dividend Discount Model (DDM) approach resulted in 11 companies in 2016 to 2019 being undervalued. While the share price of property and real estate companies assessed using the Price to Book Value (PBV) approach for 2016, there are 3 companies in overvalued condition and 8 companies undervalued. For 2017 and 2018, there were 4 companies that were overvalued and 7 companies undervalued. While in 2019 there are 5 companies in overvalued condition and 6 companies that are undervalued.
3. The results of the stock valuation model comparison analysis show the Dividend Discounted Model (DDM) approach is the lowest aberration of stock valuation models, with rmse values in 2016-2019 of 1,916.13, 2,064.51, 958.88, and 551.38.

5.2. Suggestions

The advice that can be given by the author after doing this research is:

1. For researchers who will conduct further research, it is recommended to use other share price approaches/methods other than Dividend Discounted Model (DDM) and Price to Book Value (PBV) such as Discounted Cash Flow (DCF), Price Earning Ratio (PER), and Free Cash Flow to Firm (FCFF) to increase the variety of approaches/methods of stock price research in order to increase the reader reference.

2. For investors
   a. That DDM method is a more accurate approach because there is an element of predicting cash flow / cash flow in the future, although there is indeed an element of judgment of researchers.
   b. Before making a decision, investors should valuation or valuation the stock.

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