



A Study On Reliability Of Dividend Discount Model In Determining The Intrinsic Value Of Selected Stocks From NSE

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Abstract

The purpose of this research is to empirically test the forecasting power of a well-known asset valuation model, the dividend discount model. It examines if there exists a reliability on this model by estimating the difference between intrinsic values predicted by this model and realized returns at varied expected growth rate in dividends. The objectives of the study is to examine the various variables used to predict the share prices of selected mid cap companies using DDM. Also, to evaluate the stock prices of selected companies using DDM in the view of market uncertainties. To compare the valued stock's intrinsic value with their market stock value resulting in their overvaluation and undervaluation and to derive an outcome of tested applicability of DDM model for investors to take decisions. All the 10 selected Midcap Stocks are overvalued by Dividend Discount Model and there is a significance difference between intrinsic value and market value as on July 31st 2021. The mean of Intrinsic value and market value of 10 selected midcap stocks are significantly varying. The results suggest that there exist significant differences between the returns forecasted by the dividend discount model and the realized returns.

Keywords: Dividend Discount Model, CAPM, Equity, Returns, Investment, Stock Market

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1.1 Introduction

As part of the economic liberalization process, the stock market occupies an important position in financing the Indian business sector. In addition to being able to mobilize investment resources directly from investors, providing liquidity to investors and supervising and restricting the management of companies are the main functions of the stock market. The main attraction of equity markets is that they provide entrepreneurs and governments with a means to mobilize resources directly from investors and provide them with liquidity. There are also suggestions that the liquid market should improve resource allocation and improve prospects for long-term economic growth. The stock market is also expected to play an important role in regulating business management.

One of the most common ways for businesses to raise long-term capital is through the issuance of stock. By offering its shares on the open market, the corporation is able to raise more cash for business expansion. On the other hand, the exchange's liquidity enables investors to quickly sell their shares. This is regarded as a key benefit of stock investing when compared to other less liquid investments (such real estate and other real estate assets). Stock trading has a significant impact on a nation's economic dynamics and aids in gauging public opinion about corporate decisions. In essence, a nation's economy revolves around the stock market, where people's savings are turned into profitable long-term investment through stock market.

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1.2 Review of Literature

Eddy Sutjipto, Wawan Setiawan, Imam Ghozali in their article Determination of in their piece on determining intrinsic value Dividend Discount Model and Discounted Cash Flow Methods for the Indonesian Stock Exchange (2020): The Dividend Discount Model and two Discounted Cash Flow (DCF) models will be utilised in this study to assess equities (DDM). To help investors choose the best stocks and reap future rewards, the two models will also be contrasted to discover which is the most accurate. According to the study's findings, 40 undervalued firms (93percent) and three overpriced firms (7%), respectively, exist using DDM, whereas 25 undervalued firms (58 percent) and 18 overpriced firms exist using DCF (42 percent). Since DDM's mean absolute price error (MAPE) is smaller than that of DCF's, we can conclude that DDM is more accurate than DCF since the mean absolute price error (MAPE) for DDM is 46 percent, whereas the figure for DCF is 206 percent.

Tobias Olweny, Common stock valuation is a crucial yet challenging process. When compared to loans or preferred stock, the stock needs a more thorough investigation. The three main methods used to value common stock are as follows: (i) Relative valuation models, which are based on the firm's earnings power, book value, and sales. (ii) The discounted cash flow methodologies, where the present value of a certain measure of cash flow, such as dividends or operating cash flow, among others, is used to assess the stock's worth.

Sukono, Dwi Susanti, Isah Aisah, Agus Supriatna, Jumadil Saputra, Abdul Talib Bon in their article 'Stock Assessment Using a Dividend Discount Model with Growth Rate Following a Time Series Pattern (2019)': Setting various amounts of dividend growth is used to determine the potential price of a company using a dividend discount model. An Autoregressive Integrated Moving Average (ARIMA) model was used to predict the projected dividend magnitude. The dividend discount models, which involve some amount of growth, are used to determine the potential price of the stock. The current value of all dividend payments for a period of $2(n+1)$ through infinite time) is calculated using the dividend discount model of stock prices in the

period to $n+1$.

Zura Kakushadze and Willie Yu (January 2016): The goal of this study is to motivate the investing community to build natural hazard models that include multi-aspect risk fashions of fashion elements, key additives (beta), and/or industry characteristics. Daily close-to-close returns are considered in the samples, and the factor is calculated using the day immediately before the 21-day period. Quantitative traders would create their own risk models rather than wasting money on off-the-shelf alternatives, utilizing "standard lore" for computing the factor covariance matrix and particular (idiosyncratic) risk, which is done using a (weighted) regression, according to the study's results and gaps.

Pablo Fernandez (2015): According to the findings, there is a systematic relationship between risk and return that might lead to market portfolio mean-variance inefficiency. The primary gap in this study is financial professionals who mix (or think that expected return and needed return are equivalent) expected cash flows and required returns.

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1.3 STATEMENT OF THE PROBLEM

The investors face difficulty while identifying the opportunities. The goal of investing is to find out stocks that are trading for less than their intrinsic value. However, the general idea is to buy a stock for less than its worth, and evaluating intrinsic value can help investor to take decisions. So, calculating intrinsic value through 'Dividend Discount Model' will provide an idea as to hold or sell a stock.

1.4 OBJECTIVES OF THE STUDY

- To evaluate the stock prices of selected companies using Dividend Discount Model (DDM) in the view of market uncertainties.
- To compare the valuated stock's intrinsic value with their market stock value resulting in their overvaluation and undervaluation.

1.5 RESEARCH METHODOLOGY:

This study considers 10 year Historic data for 10 Indian Mid Cap companies from various industry.

Table showing the samples With their market capitalization



Sl. No	Company	Industry	Market Capitalization
1	Apollo Tyres Ltd.	AUTOMOBILE	14,207
2	Torrent Power Ltd.	POWER	23,649
3	SRF Ltd	CHEMICALS	32,056
4	Bharat Forge Ltd.	INDUSTRIAL MANUFACTURING	27,746
5	Voltas Ltd.	CONSUMER GOODS	33,152
6	City Union Bank Ltd	FINANCIAL SERVICES	11,392
7	Coforge Ltd.	IT	17,733
8	Glenmark Pharmaceuticals Ltd.	PHARMA	13,112
9	Bharat Electronics Ltd	DEFENSE	48,390
10	Castrol India Ltd.	LUBRICANTS	13,457

Sources of Data

Secondary data is used for the study, Information regarding size of different companies, Stock prices, dividend rates, market risk, Risk free return etc. were collected from:

- News Articles
- NSE/ RBI/ SIMPLY WALLSTREET Websites.
- Investopedia.com, Capitaline.com

HYPOTHESIS:

Null Hypothesis: There are no significant differences between market value and Intrinsic Value.

Alternative Hypothesis: There is a significant difference between market value and Intrinsic Value.

ANALYSIS

Normality tests are used to determine if a data set is well-modeled by a normal distribution and to compute how likely it is for a random variable underlying the data set to be normally distributed.

Data are tested against the null hypothesis (H0) that it is normally distributed. Majority of the normality tests are done by comparing the calculated cumulative series with the theoretical normal distribution. JB Test is a goodness-of-fit test to check if the skewness and kurtosis of the sample data follow normal distribution.

An analysis was done on the returns from all the selected stock. Extremely large value of JB statistic indicates that the data values do not follow the normal distribution. This is confirmed by looking at the p value, at 5% level of significance the null hypothesis can be rejected since the p value for all the markets are less than 0.05 which confirms that the return values are not normally distributed.

After checking for the normality of data it is

necessary to check the stationary of data.

Forecasting of time series data assumes that the data is stationary in nature.

It is a data characteristic which shows an extent of similarity between values of the same variables over successive time intervals. Autocorrelation is a statistical tool used for measuring the dependence of successive terms in a given time series. The presence of autocorrelation in the residual of a model is signal that the model may not be perfect predictor

At 5% level of significance the p level is found to be greater than the critical value 0.05. Hence, we accept the Null Hypothesis. This confirms that there is no Autocorrelation that is the terms in data series are independently distributed.

In this study, 10 midcap stocks from different sectors with 10 years past data are taken into to find out its intrinsic value using Dividend Discount Model.

The various variables used to predict the share prices of selected mid cap companies using DDM are given below:

$$P = \frac{D_0(1+g)}{r-g}$$

Where,

P = Present value of stock

D₀ = Current Value of Dividend/ last year dividend.g = Dividend Growth Rate

r = Ke = Cost of equity (Calculated using Capital Asset Pricing Model)

CAPM is calculated according to the following formula:



$$R_a = R_f + [\beta * (R_m - R_f)]$$

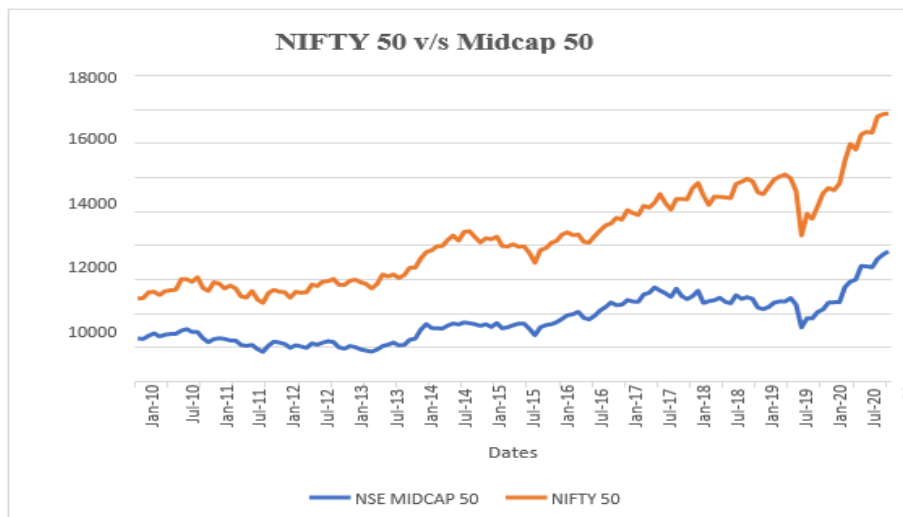
Where:

R_a = Expected return on a security R_f = Risk-free rate

β = Beta of the security (slope) R_m = Expected

return on market

Graph showing comparison of NIFTY 50 with NIFTY Midcap 50:

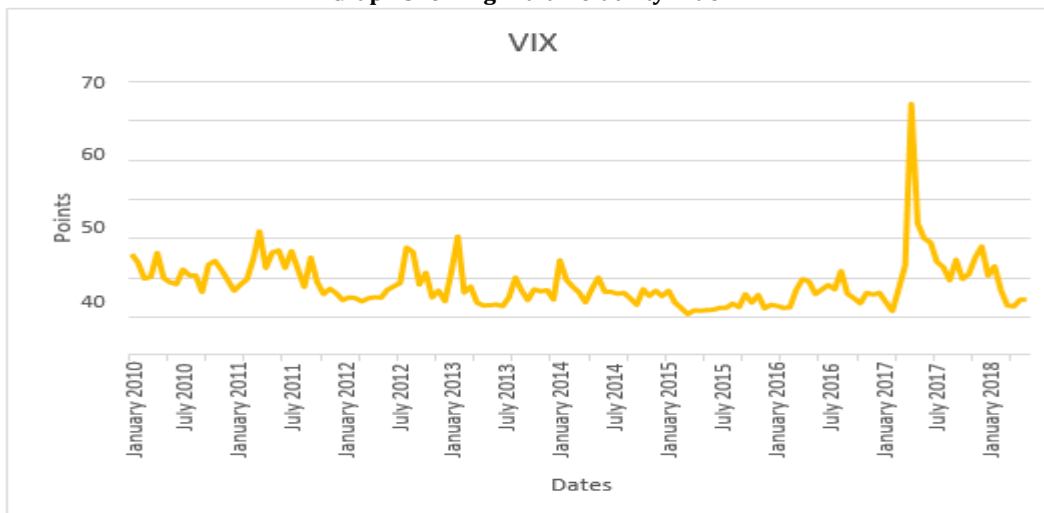


Source: www.nseindia.com

Here we can see, the Nifty Midcap 50 index outperforms the Nifty 50 in both the short and long run. As we know already, for the past one

year the Indian market, especially the midcap and small-cap stocks constantly being injected with high volume.

Graph showing India Volatility Index:



Source: www.moneycontrol.com

The VIX is also known as the Fear Index because a higher level of VIX normally reflects a higher level of fear prevailing in the market. That is the reason market crashes are preceded by a sharp spike in the VIX or immediately

followed by a sharp spike in the VIX. On the other hand, when the VIX is subdued below the 15 marks for a sustained period of time, it is a signal that downsides in the market are largely

limited. At the time of the 2020 crash India VIX reached 80 marks.

As we know, high volatility indicates uncertainty in the market, whether it will go downside or upside. It was peak time when India VIX reached 80 marks back in 2020. As data suggests at the time of the 2020 crash volatility spiked 401% from the 1-year average VIX value of 21.3 and around 518% increase from the 5-year average of 16.5.



Table showing CAPM returns and actual returns:

	Actual Returns	CAPM Returns	Overvalued/Undervalued
NSE MIDCAP 50	12.86		
Apollo Tyres Ltd	21.76	12.72	Overpriced
Torrent Power Ltd	11.3	10.59	Overpriced
SRF Ltd	41.3	12.94	Overpriced
Bharat Forge Ltd.	21.9	12.40	Overpriced
Voltas Ltd.	23.5	13.60	Overpriced
City Union Bank Ltd	20.7	10.64	Overpriced
Coforge Ltd.	37.6	9.39	Overpriced
Glenmark Pharmaceuticals Ltd.	14.0	8.89	Overpriced
Bharat Electronics Ltd	16.9	11.54	Overpriced
Castrol India Ltd	9.4	10.00	Under-priced

The relationship between systematic risk and expected return for assets, particularly stocks, is described by the Capital Asset Pricing Model (CAPM). The CAPM is frequently used in finance to value hazardous securities and calculate projected returns for assets given their risk and cost of capital.

Calculation of Intrinsic Value of 10 selected Mid-Cap Stocks

Under Dividend Discount Model, the intrinsic value is calculated on the Book Value of the stocks. It takes into consideration three main

variables i.e., last year dividend, growth rate and Cost of Equity.

- Last year dividend is D_0 .
- Growth rate (g) is assumed to be constant which is calculated by RRI function (which returns an equivalent rate on growth of an investment).
- Cost of Equity (K_e) is the rate of return a company pays out to equity investors. Here it is calculated by CAPM.

Intrinsic value

NSE MIDCAP 50	CAGR	Intrinsic Value	Market value	Value
Apollo Tyres Ltd	9.78	100.43	223.45	Overvalued
Torrent Power Ltd	5.66	118	455.2	Overvalued
SRF Ltd	5.02	159.11	8658.7	Overvalued
Bharat Forge Ltd.	0	16.13	771.65	Overvalued
Voltas Ltd.	12.07	365.13	1059.2	Overvalued
City Union Bank Ltd	0	2.35	150.25	Overvalued
Coforge Ltd.	4.97	309.25	5083.9	Overvalued
Glenmark Pharmaceuticals Ltd.	2.96	38.55	607.45	Overvalued
Bharat Electronics Ltd	0	12.44	184.65	Overvalued
Castrol India Ltd	0	27.51	138.4	Overvalued

Table showing different variables to analyze Market and Stocks as on July-2022:

	Average Return (p.a)	SD	Beta	CV
NSE Mid Cap	12.9	7.30	1.000	0.568014
Apollo Tyres Ltd	21.8	12.18	0.981	0.55963
Torrent Power Ltd	11.3	11.51	0.692	1.016579
SRF Ltd	41.3	97	1.011	0.290005
Bharat Forge Ltd.	21.9	10.28	0.937	0.469768
Voltas Ltd.	23.5	10.74	1.101	0.456562
City Union Bank Ltd	20.7	8.46	0.698	0.407882
Coforge Ltd.	37.6	11.53	0.528	0.306849
Glenmark Pharmaceuticals Ltd.	14.0	10.31	0.460	0.738839
Bharat Electronics Ltd	16.9	10.99	0.820	0.649027
Castrol India Ltd	9.4	8.14	0.611	0.864992



Test: Paired 2 sample for Means

To evaluate whether there is a significant difference between the means of two groups that may be related in some ways, a t-test is used. Three crucial data variables are needed

to perform a t-test. They consist of the number of data values in each group, the standard deviation of each group, and the difference between the mean values from each data set (referred to as the mean difference).

	Intrinsic Value (In Rs)	Market Value as on July 31st (In Rs)
Mean	114.9079284	1733.285
Variance	16583.1463	8132851.338
Observations	10	10
Pearson Correlation	0.442905983	
Hypothesized Mean Difference	0	
df	9	
t Stat	-1.829623883	
P(T<=t) one-tail	0.050277823	
t Critical one-tail	1.833112933	
P(T<=t) two-tail	0.100555647	
t Critical two-tail	2.262157163	

t-test enables us to assess whether two data sets came from the same population by comparing their average values. In the cases above, if we take one from market value and another from intrinsic value, we would anticipate that they would have the same mean and standard deviation.

Hypothesis for Mean values:

- Null hypothesis: There is no significant difference between the mean value of selected prices
- Alternate hypothesis: There is a significant difference between the mean value of selected prices

As the p-value is greater than to 0.05. So, here the Null hypothesis is rejected

1.6 Findings

- ✚ The Dividend Discount Model is calculated on the basis of Book Value of Stock and not market value.
- ✚ All the 10 selected Midcap Stocks are overvalued by Dividend Discount Model and there is a significance difference between intrinsic value and market value as on July 31st 2021.
- ✚ The mean of Intrinsic value and market value of 10 selected midcap stocks are significantly varying.
- ✚ The Market Value of SRF Ltd, Bharat

Forge Ltd, City Union Bank Ltd, Coforge Ltd, Glenmark Pharmaceuticals Ltd and Bharat Electronics Ltd is more than 90% when compared to its calculated intrinsic value by DDM method. The Market Value of Apollo Tyres Ltd, Torrent Power Ltd, Voltas Ltd and Castrol India Ltd is less than 90% when compared to its calculated intrinsic value by DDM method.

1.7 Conclusion

In this study, the dividend discount model is estimated to compute the expected returns for the 10 midcap stocks of NIFTY MIDCAP 50 and compared with realized returns over a period of 2011-2021. The following research objectives were met : various variables used to predict the share prices of selected mid cap companies using DDM were examined ; stock prices of selected companies using DDM in the view of market uncertainties were evaluated; compare the valuated stock’s intrinsic value with their market stock value resulting in their overvaluation and undervaluation; derive an outcome of tested applicability of DDM model for investors to take decisions.

In this paper we have analyzed the factors like Average returns per annum, beta factor, calculated CAPM returns, Intrinsic value of selected midcap stocks from NSE and comparison of Actual and Expected returns for the decision to conclude whether to buy or sell such stocks based on their Market Capitaliz-



ation. Overall results of DDM test doesn't seem to fetch significant value. The model doesn't seem to hold true in India to certain extent and this research is restricted only to constant dividend growth model.

1.8 Limitations

- The study is limited to only 10 Mid Cap stocks under NSE.
- The study doesn't consider sentimental analysis of the stock which plays a major role in investment decision.

Bibliography

- Fernandez, P. (2015). CAPM: an absurd model. *Business Valuation Review*, 34(1 (Spring 2015), 4-23. <https://doi.org/10.5791/0882-2875-34.1.4>.
- Kakushadze, Z., & Yu, W. (2016). Multifactor Risk Models and Heterotic CAPM. <https://doi.org/10.21314/JOIS.2016.072>
- Olweny, T. (2011). The Reliability of Dividend Discount Model in Valuation of Common Stock at the Nairobi Stock Exchange, *International Journal of Business and Social Science*, (6). Pp. 127-141.
- Sukono, Susanti, Aisah, I., Suprianta, A. (2019), Stock Assessment Using a Dividend Discount Model with Growth Rate Following a Time Series Pattern, *Proceedings of the International Conference on Industrial Engineering and Operations Management Pilsen, Czech Republic*, pp. 1574-1580.
- Sujipto, E, Satiawan, W, Ghozali, I (2021), Determination of Intrinsic Value: Dividend Discount Model and Discounted Cash Flow Methods in Indonesia Stock Exchange, *SSRN*, 11(11), pp. 1842-1852, DOI: 10.34218/IJM.11.11.2020.175.

