

How helpful is the Dividend Discount Model in understanding the stock market? What are some of its limitations?

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Abstract. The background of this article is under an era where more and more people start learning how to manage their wealth in order to generate more gains, such as investing in stocks. The purpose of this article is to provide the audience a classical model called Dividend Discount Model, which could help them value their stocks and thus make smarter investment decisions. However, this model is not perfectly workable due to the complexity of real-world financial markets. Therefore, this article would critically evaluate the effectiveness of this model and provide a more flexible model as a reference for the audience to make investment.

Keywords: dividend discount model; stock valuation; investment.

1. Introduction and Motivation

In order to earn a higher return with current amount of wealth, people in this era continuously learn how to better manage their money or savings. Usually, people start with targeting at these financial derivatives such as stocks, bonds and currency. Comparing with the other assets for derivatives, investing in stocks has many advantages. It does not only have a higher potential providing people with higher returns, but also could help people protecting their wealth from inflation. For example, the annual stock market return has been approximately 10% since 1926, however, the long-term government bonds at that time only have an annual return about 5% to 6% (DiLallo, 2022). And comparing with the annual inflation rate which is about 3.1% since 1913, there is a double-digit high return from buying annual stocks.

In addition, buying a share of stock represents the ownership of an investor in certain company, which is normally regarded as a pride to some investors. In a word, these are all the strong incentives for people to join in stock market and make some investments. Therefore, in order to make smarter decisions while investing in stocks, it is necessary for people to master the skill of valuing stocks. And one of the models they could refer to is called Dividend Discount Model.

2. Concepts and Definition

The Dividend Discount Model (DDM) a basic technique of estimating the intrinsic value of a stock. It allows the investors to predict a reasonable price for a stock based on the theory that its present-day price is worth the sum of all its future dividend payments when each payment or cashflow is discounted back into its corresponding present value. Also, the investors could choose to sell their stocks in the future for capital gains. This means the intrinsic value of the stock, in fact, is equal to the sum of present value of dividends plus the present value of stock sale price (Vaidya, 2022). Representing this in a formula when a stock is held for only one period, its Present Value = $D_1/(1+r) + P_1/(1+r)$, where “ D_t ” is the expected return dividend payment in time t , the discount rate “ r ” is an assumed constant rate of return an investor requires for the risk of owning this stock and “ P_1 ” represents the stock sale price. However, if the stock is held more than one periods, it would be challenging for the investors to predict the dividend payments for different periods, which would be D_1 , D_2 , D_3 in the formula.

One assumption of the model is that if a stock is qualified to be invested, its current price should be worth no more than what the stock’s future returns in terms of current and future dividend payments. Another assumption is that all future dividends would grow at a specific rate annually, which extended the formula into a new form where the stock’s Present Value = $D_1/(r-g) = (1+g)/(r-g)$, with a mandatory condition that “ r ” has to be larger than “ g ”. Otherwise, the present value would

be negative which is unreasonable. Obviously, DDM with the constant growth rate provides a relationship between the current stock price, current dividend, dividend growth rate and the expected return. If any three of the variables being known, the fourth could be determined.

3. Arguments and Analysis

This report will argue that to a small extent, the Dividend Discount Model is helpful for people to understand the share prices and make smarter decisions while investing in stocks. The main reason would be although DDM is helpful in telling the investors potential differences between the current prices and intrinsic value of the stock and thus they would decide whether they would make their investment decision, there are many assumptions of DDM which made this model too limited while applying it to the reality. A big highlight of the DDM is about how it informs investors the time value of the money, which means a certain amount of money worth more now than the same amount of money in the future (Chen, 2022). In other words, when the calculated present value is lower than the future dividend payment from the formula, it means our money can grow along with the time through investing. This is the logic behind the calculating process of intrinsic value of a stock in DDM, which is adding all the present values together. Through knowing the intrinsic value of the stock, the investors would know whether the stock is overvalued or undervalued based on its current price. For instance, if the calculated present value is higher than the current market price of a stock, then this stock is undervalued and qualified for a buy, vice versa. Significantly, this method requires the analysis of financial information that could be found in certain company's financial statements, which normally includes this company's past cash flows, dividend payments, and growth rates.

One example would be about the dividend payment of a famous American retailer—Walmart. Its financial report indicates that it has paid out dividends \$1.92, \$1.96, \$2.00 and \$2.04 annually between 2014 and 2017. There is a clear pattern of a consistent increase of 4 percent in Walmart's dividend year by year, which is an average growth of 2% approximately. Now assuming an investor requires a return rate of 5% for taking the risk. Therefore, if an investor would like to use an estimated dividend of \$2.04 at the beginning of 2018, he would use the dividend discount model to calculate a present value of $\$2.04 / (0.05 - 0.02) = \69.36 per share (Chen, 2022). And according to the stock database for Walmart Inc, its market price at the beginning of 2018 is around \$100.13 which means this stock is ready for people to make an investment (Google Finance, 2022). Therefore, the investors should make sure they have access to reliable dividend histories of the company such as finding the company's financial report online. Also, the investor could benefit from selling this stock in 2019 after holding it for one year period. Noticeably, there would be an anticipated rise in the future selling price since a stockholder would absolutely sell with a higher price than his original purchasing price. This capital gain is realized when the stock is sold and depends on the price volatility, so the investors had better pay close attention on the fluctuations of stock price since timing is very important.

Even if the dividend discount model could be appropriately applied to the mature business which could have a regular dividend payment to investors, this could become one of the limitations of the DDM. In reality, many companies could not provide a stable track record of dividend payments, instead, these companies give amazing returns to the investors through their high growth performance. And this leads to another problem with DDM that it neither successfully explain how the stock of some newer companies with fluctuating dividend growth rates could be valued, nor explained how the stock of these high-growth companies such as Google, Amazon and Facebook could be valued. For some small companies at the initial stage who are not ready for paying the dividend, the investor will dismiss a lot of wonderful investment opportunities if they use DDM to calculate the present value of such companies' stocks.

Under this circumstance, it is strongly suggested for the investors to determine a benchmark for valuing the targeting stock. This is called "Comparable Company Analysis" which means investors could value a company through analyzing other similar companies' comparable ratios and make sure these companies' index are standardized into their targeting company's metrics. Specifically, the

similar characteristics between the companies could be determined by their size (revenue, assets, employees), geography and profitability (CFI, 2022). One example for comparable ratio could be price to earnings ratio (P/E), where “P” is the market share price and “E” is the earnings per share. This ratio shows the price an investor must pay for each unit of potential future earnings. If the P/E ratio is high, it means this stock is overvalued because its price is high compared to its earnings. For example, using the S&P 500 index stocks as a benchmark where the average P/E is 25, the P/E ratio of Coca-Cola as of September 30, 2022 is 22.96 which is relatively low (Macrotrends, 2022). This means the Coca-Cola’s stock price might be undervalued.

The next limitation of DDM is about its over-sensitivity according to assumptions. Back to its formula of calculating the present value of the stock which is represented by $(1+g)/(r-g)$. Due to the fact that the difference between two rates in the denominator are normally very small as percentages, each one percentage point change in either the dividend growth rate or the required return rate could lead to a big change in the present value of the stock. Using the previously mentioned Walmart firm as an example, if the required rate of return increases from 5% to 6%, the resulting stock price would decrease from \$69.36 to $\$2.08 / (0.06 - 0.02) = \52 , which is a nearly 25% decrease than the original stock price. Also, there are other assumptions regarding the constant growth rate and required return rate in DDM, so this would give big pressure on investors when they do the calculations. A slight error appearing in any step of calculating these variables, the result could be severe in terms of an overvalued or undervalued stock. In addition, DDM fails to explain the situation where some companies might have a lower rate of return (r) than their dividend growth rate (g). In real life, this could possibly happen when a company keep paying the dividends even if its current earnings is low or even making a loss.

The last limitation regarding DDM would be that it is over conservative. The investors should understand that dividend payment or stock price appreciation is not the only way company could return wealth to the shareholders. One of the many ways of stock valuation not caught by DDM is when company decides to do some “Stock Buybacks”. This occurs when a company buys back its shares from the marketplace with its accumulated cash. This process of repurchasing the shares allows this company to do a self-investment and make itself more financially attractive. On one hand, a key reason for a company to issue shares is raising equity capital to fund its expansion, however, if there has been no room for its potential growth in the market, holding these “useless” equity funding and sharing the ownership with the private sectors is a significant cost to the company. On the other hand, since these repurchasing shares are absorbed by the company, the number of outstanding shares on the market would decrease. When there are fewer shares existed in the market, the relative stock ownership of each investor would thus increase (Segal, 2022). Certainly, stock buyback could benefit both company and the investors. What Apple has done in the past ten years could be a great example since it has spent more than \$467 billion for share buybacks (Leswing, 2022). From Apple’s past experiences, the investor should observe an obvious precursor of stock buybacks, which is a continuous rise in Apple’s stock price. It does not only show the relative limited growth space Apple has comparing with the other electronic products companies, but also represents Apple’s strong power in its capital return program. By doing this, Apple successfully reduced the supply of shares in the market to boost its stock price, and thus the money is returned back to shareholders. At the same time, reducing the amount of shares in the market effectively increased investor’s earnings per share. This is supported by the evidence that since August 2018, when Apple first buybacks a \$1 trillion value, its stock price has increased by 252% (Leswing, 2022).

4. Conclusion

In general, to a small extent, Dividend Discount Model is helpful for investors to value the share and make better investment decisions. Even though it is a useful model for understanding the mechanisms driving the stock prices and make investments through comparing the stock price with the real value of a stock, it is still not very authoritative and complete since it did not take many

companies' stocks that are not accord with the assumptions into account. Specifically, for these companies who cannot pay dividends, does not have a constant dividend growth rate or might conduct some stock buybacks, the DDM is not a suitable technique for these companies' investors to apply to.

Therefore, the biggest challenge is still about how to make the model applicable to the real-life investing situations as much as possible. Instead of using DDM which is an absolute stock valuation technique, using the "Comparable Companies Analysis" which is a relative stock valuation technique sometimes might be more practical since it could easily determine a benchmark value through comparing and assessing the fundamental features of similar firms (Schmidt, 2022). This is saying that whenever people are trying to invest in stocks, they should research enough about not only a targeted company's financial growth trend, but also the companies providing similar products or services to give investors a comprehensive view.

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