



1FP571

Special seminar – Advanced Corporate Finance



EVROPSKÁ UNIE
Evropské strukturální a investiční fondy
Operační program Výzkum, vývoj a vzdělávání



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Dividend Discount Model

Dividend discount model (DDM) is a method of valuing a company's stock price based on the theory that its stock is worth the sum of all of its future dividend payments, discounted back to their present value.

= quantitative method used for predicting the price of a company's stock based on the theory that its present day price is worth the sum of all of its future dividend payments, when discounted back to their present value.

When the value obtained from the DDM is higher than the current trading price of shares, then the stock is undervalued and qualifies for a buy, and vice versa.

The equation most widely used is called the Gordon growth model (GGM). It is named after Myron J. Gordon of the University of Toronto, who originally published it along with Eli Shapiro in 1956.



Dividend Discount Model

Value of stock = Expected dividend per share) / (cost of capital equity – dividend growth)

$$P_0 = D_1 / (r-g)$$

$$r = D_1/P_0 + g$$

Dividend Yield D_1/P_0 + Growth = Cost of Equity

Consider the dividend growth rate in the DDM model as a proxy for the growth of earnings and by extension the stock price and capital gains. Consider the DDM's cost of equity capital as a proxy for the investor's required total return.

Income + Capital Gain = Total Return



Dividend Discount Model

Properties of the model:

a) When the growth rate is zero, the dividend is capitalized:

$$P_0 = D_1 / r$$

b) The equation is also used to estimate the cost of capital by solving for r :

$$r = D_1 / P_0 + g$$

c) Which is equivalent to the Gordon Growth Model:

$$P_0 = D_1 / (k - g)$$

Assume Company X paid a dividend of \$1.80 per share this year. The company expects dividends to grow in perpetuity at 5 percent per year, and the company's cost of equity capital is 7%. The \$1.80 dividend is the dividend for this year and needs to be adjusted by the growth rate to find D_1 , the estimated dividend for next year.

$$D_1 = D_0 \times (1 + g) = \$1.80 \times (1 + 5\%) = \$1.89.$$

Using the GGM, Company X's price per share is found to be

$$D(1) / (r - g) = \$1.89 / (7\% - 5\%) = \$94.50.$$



Dividend Discount Model

Example: Assume that Company X

- paid a dividend of \$1.80 per share this year
- expects dividends to grow in perpetuity at 5 percent per year
- company's cost of equity capital is 7%.

The \$1.80 dividend is the dividend for this year and needs to be adjusted by the growth rate to find out the D_1 = estimated D for next year.

$$D_1 = D_0 \times (1 + g) = \$1.80 \times (1 + 5\%) = \$1.89.$$

Using the Gordon Growth Model, Company X's price per share is found to be as

$$D(1) / (r - g) = \$1.89 / (7\% - 5\%) = \mathbf{\$94.50}$$



Dividend Discount Model

Problems of the model:

- a) Assumes a steady and perpetual growth rate **less** than the cost of capital; possibly unreasonable.
- b) Assumes a constant dividend growth in perpetuity. This assumption is generally safe for very mature companies that have an established history of regular dividend payments. However, DDM may not be the best model to value newer companies that have fluctuating dividend growth rates or no dividend at all. One can still use the DDM on such companies, but with more and more assumptions, the precision decreases.
- c) If no dividend currently paid (growth stocks), more general versions of the discounted dividend model must be used to value the stock: assuming the Miller-Modigliani' hypothesis of dividend irrelevance, replace the dividend D with E earnings per share. This requires use of earnings' growth as a substitute of the dividend growth -> possibly not true.
- c) The stock price resulting from the Gordon model is sensitive to the growth rate g chosen.



Dividend Discount Model

REFERENCES

Investopedia, Dividend Discount Model – DDM, <https://www.investopedia.com/terms/d/ddm.asp?>

Wikipedia, Dividend discount model, https://en.m.wikipedia.org/wiki/Dividend_discount_model?