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DDM <GO>
Dividend Discount Model
Help Page

Enter DDM <GO>, then press <Help>

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What Is Dividend Discount Model (DDM)?

DDM <GO> is a calculator that allows you to determine the intrinsic value of a selected equity using the present value of future cash flows, discounted at an appropriate rate. You can compare this theoretical value to the current price of the equity to determine whether it is under- or overvalued.

DDM is organized into a toolbar and two sections that allow you to calculate the theoretical price, IRR, expected return, and implied growth rate based on a series of assumptions. Once you load an equity security and update highlighted fields in the *Dividend Discount Model* section, you can see the resultant theoretical price and other computed values at the bottom of the screen.

Note: DDM calculations depend on data from specific fields that you can find in the *Field Search* (FLDS) function. For example, if you were looking for the Bloomberg estimate for EPS for a given security, you could use BE008 (BEST_EPS). This field is an overridable field, which means that you can set additional criteria to get the data you need. BE997 (BEST_FPERIOD_OVERRIDE) allows you to select the fiscal year for the estimate.

Toolbar

The toolbar allows you to update the security under analysis.

For more information about updating the security, see Using the Model.

Dividend Discount Model

The *Dividend Discount Model* section allows you to enter your own assumptions about the present value of future cashflows and the appropriate discount rate for the loaded security, so you can test the effects on the theoretical price and other measures in the computed values section.

- For more information about updating the assumptions, see Using the Model.
- For definitions of the highlighted fields, see Definitions.

Computed Values

The computed values section displays the theoretical value of the security under analysis and value projections based on the assumptions entered in the *Dividend Discount Model* section.

- For more information about the calculations underlying the computed values, see Calculations.
- For definitions of the values, see Definitions.

Using DDM

The following topics explain how to use DDM to calculate the intrinsic value of a security.

For a description of the function see What Is DDM?.

Using the Model

You can calculate the theoretical price for a security and other values by updating the highlighted fields in the *Dividend Discount Model* section.

To compute values:

1. In the toolbar, update the security field by entering a ticker or typing a name, then selecting a security from the autocomplete menu.
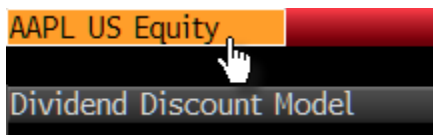
The security is loaded and screen updates.

2. Update any of the highlighted fields, then press <GO>.

   Note: For definitions of the fields, see Definitions.

   The *Computed Values* section updates to reflect your new assumptions.

Analyzing Risk Premium

You can measure the relative risk/reward of investing in a selected equity and/or equity market in the *Equity Risk Premium* screen.

The screen allows you to calculate the expected additional return (equity risk premium) sought above the specific country/region's risk-free rate when investing in a selected equity.

To access the *Equity Risk Premium* screen:

In the *Dividend Discount Model* screen, click **Risk Premium**.

The *Equity Risk Premium* screen appears.

Note: For more information about using the *Country Risk Premium* (CRP) function to analyze risk for countries and the Eurozone region, see the CRP Help Page.

Calculations

Background

The dividend discount model estimates the intrinsic value of an equity using the present value of forecasted dividends. The first step in the process is to project a potential earnings stream using explicit earnings estimates for the current and following year and for the subsequent year, FY3, if available, plus an estimate of the long-term growth rate for those earnings. From this projected earnings stream, a dividend payment schedule is derived and discounted to the present value.

Discount Rate Assumptions

The model uses the risk-free rate of the 10-year treasury bond plus a risk premium (also known as the market's required rate of return) as the discount rate. The risk premium is calculated using a base risk premium for the issue's country and multiplying this value by the applied beta. The country risk premium is calculated by using capitalization-weighted forecasted dividends and expected growth rates to determine an implied market return on equity. The risk-free rate is then subtracted to calculate the risk premium.

Model Stages

DDM is based on a three-stage dividend discount model consisting of a growth, transition, and mature or steady-state stage. (Before the growth stage, there are years FY1 and FY2. The dividends in these years naturally enter into the PV calculation.) The length of the growth and transition periods depends on whether the equity is classified as explosive growth, high growth, average growth, or slow/mature growth. This classification is based on the normalized distribution of the forecasted growth rate for all equities. Explosive growth equities are at the high end of the distribution, whose growth rate is significantly above the normalized mean or median, while those at the low end of the distribution are classified as slow/mature growth issues. Equities at the high end of the distribution have shorter growth periods with longer transition periods, while those at the low end have longer growth periods with shorter transition periods.

- **Growth Stage**: During the first year of the growth stage, if there is an explicit EPS forecast for FY3, use that forecast. If there is no explicit forecast for FY3, the EPS in FY3 is set as FY2 * (1 + long-term growth rate). During the remaining years of the growth stage (if growth years = 9, then number of remaining growth years = 8), EPS grows at the long-term growth rate. In this initial stage, the earnings per share grow at the long-term growth rate for the stated number of growth years starting with next year's estimate. An explicit EPS forecast is also used, if available. The model initially sets the length of the growth stage to three years for explosive growth, five years for high growth, seven years for average growth, and nine years for slow growth. The growth rate defaults to the mean secular growth rate. You can modify any of these values.

- **Transition Stage**: Following the growth stage, the model assumes that the earnings growth rate for the firm approaches the rate that applies to the general market for all mature issues. Firms with an above average growth rate assumption in the growth stage begin to see a linear decrease in their growth rate to arrive at the mature stage growth rate. Firms with a below average growth rate assumption in the growth stage see a linear increase in their growth rate to arrive at the mature stage rate. The model applies the same linear increase or decrease to the payout ratio to arrive at the mature stage payout ratio, which defaults to 45%.
  The default length of the transition period is 14 years for explosive growth issues, 12 years for high-growth issues, 10 years for average growth issues, and 8 years for slow-growth issues. In general, issues with high growth rates should have shorter growth periods and longer transition periods, while slow growth issues should have longer growth periods and shorter transition periods.

- **Mature Stage**: After the transition stage, the model assumes that all issues have the same earnings growth rate and payout rate. The payout rate defaults to 45%. The growth rate is dynamically linked to the market's required rate of return (the long bond yield plus the risk premium). The model multiplies the retention rate (100% minus the payout rate) by the required rate of return to obtain the mature stage growth rate. This ensures that the growth rate at maturity does not exceed the market's required rate of return and is related to the level of interest rates in the overall economy. You can modify both the payout rate and the growth rate in the mature stage, but the growth rate cannot exceed the market's required rate of return.

Interpretation

An accurate theoretical price is a function of estimated earnings per share over an issue's projected growth stage and subsequent trend toward becoming a mature issue. In essence it is the capacity of an issue to pay dividends at an average market rate using the earnings per share forecast, whether or not those dividends are actually paid out at that rate or not. The model assumes that all issues eventually approach maturity, where the default ratio is 45%.

If an issue has negative earnings per share estimates, but a positive growth rate, the model assumes that 5% of revenue per share will translate to earnings per share in the growth stage. If a firm has no revenues, the model assumes that the issue will earn 0.01 in the growth stage.

In order for DDM to work properly, the currency of the earning estimates should be the same as the currency of trade. If that condition isn't satisfied, calculation is halted and a warning message displayed. In such cases, an equivalent equity which trades in the currency of the estimates reports is likely to exist. When the calculation is halted on wakeup, it can still be run by overriding the wakeup values.

Example - Projected EPS

Assume that a U.S. equity has per share earnings estimates of $0.50 in the first year and $1.00 in the second year with an indicated annual dividend of $0.10. Also assume that the firm has an annual growth rate of 15% and that its growth and transition stages are each two years.

The firm's current payout ratio is then 20% as a result of its current annual dividend and first year earnings of $0.50 per share (0.10/0.50 = 20%). Assume that the current 10-year Treasury bond rate is 6% and that the equity risk premium is 4%. This sets the market's required rate of return or discount rate to 10% (6% + 4%).

The model's first step is to calculate the firm's projected per share earnings stream. As stated above, the company's first- and second-year earnings are $0.50 and $1.00 per share, respectively. During the subsequent two-year growth stage, earnings increase at 15% annually, so year three earnings are $1.15 (1.00 * 1.15) per share and year four earnings are $1.32 (1.15 * 1.15) per share.

In the next two years (transition stage), the growth rate approaches the mature stage growth rate, which is the market's required rate of return (long-term bond rate plus risk premium) multiplied by the retention rate at maturity. Since the model assumes a payout of 45% at maturity, the retention rate is 55% (100% - payout rate of 45%). The company's growth rate during the mature stage is the retention rate multiplied by the required rate of return, which is 5.5% (10.0% * 55%).

Therefore, during the transition stage (year five and year six), the earnings growth rate linearly moves from 15% to 5.5%. According to the model, the firm's earnings growth decreases by approximately 3.167% per year between the end of the growth stage and the beginning of the mature stage, falling to 11.83% in year five and 8.67% in year six. Using these growth rates the company's earnings per share for years five through seven can be calculated. For year five, the earnings per share will be $1.48 (1.32 * 1.1183), and for year six the value will be $1.61 (1.48 * 1.0867). The issue's earnings per share throughout the mature stage (year seven) is then $1.70 (1.61 * 1.055).

Example - Projected Dividends

From the earnings stream, the model derives a projected dividend payment schedule over the seven years of earnings. During the growth stage, the model determines the dividend payout by dividing the current dividend by the first year earnings per share (0.10/0.50, or 20%). For issues that do not currently pay dividends, the payout will be zero during the growth stage.

Once in the transition stage, the payout rate linearly approaches the mature stage payout, which defaults to 45%. In this case, the payout would increase by 8.33 (25/3) per year, moving from 20% in year four to 28.33% in year five and 36.67% in year six. In the mature stage (year seven), the payout rate reaches 45%.

If an equity has no current dividend, then the dividend payout would be zero during the growth stage (years three and four); but once in the transition stage, the payout would linearly increase from 0% to 45%, or 15% per year over the three years.

The following table summarizes the model's earnings per share and dividends per share projections:

Year	EPS	Payout	DPS	Payout	DPS
1	0.50	20.00%	0.10	0.0%	0.00
2	1.00	20.00%	0.20	0.0%	0.00

Year	EPS	Payout	DPS	Payout	DPS
3	1.15	20.00%	0.23	0.0%	0.00
4	1.32	20.00%	0.26	0.0%	0.00
5	1.48	28.33%	0.42	15.0%	0.22
6	1.61	36.67%	0.59	30.0%	0.48
7	1.70	45.00%	0.76	45.0%	0.76

Note: The last two columns illustrate the case when the issue does not pay a current dividend.

Example - Theoretical Price

The model calculates a theoretical price for the equity by determining the present value of the projected dividend stream using the market's required rate of return (10% in the example). Using a hypothetical issue with the 20% current payout:

$$PV = 0.10/(1.10) + 0.20/(1.10)^2 + 0.23/(1.10^3) + ... 0.59/(1.10^6) = 1.2$$

Once the present value of the projected dividends in the first six years has been calculated, the model adds the terminal value of the firm's mature stage dividends to the above sum to obtain the final theoretical price. The model calculates the terminal value using the Gordon constant growth model:

$TV = D/(R-G)$ where:

R is the required rate of return, and G is the mature stage growth rate. The value D is calculated as follows: EPS for the year following the last transitional year is calculated, using growth rate at maturity. DPS is then derived by multiplying EPS by payout at maturity. D is then derived by discounting DPS by the discount factor of year 6:

$$D = 0.76/(1.10^6)$$

Here, D turns out to be 0.43, which is then used in the Gordon constant growth equation to obtain a terminal value.

$$TV = 0.43/(0.10 - 0.055)$$

In the example, the terminal value is about 9.6. Adding this to the 1.2 (the present value of the dividends in the first six years) results in the final theoretical value of the equity, which is about 10.8 (TV + PV).

Take the next step.

For additional information,
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