

Video 16 - Stock Valuation: Zero Growth Stocks

The following is a supplementary transcript for tutorial videos from

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Hi everyone. Now that we have learned what stocks are, we are now ready to calculate their prices. Over the course of the next four videos, we will be learning about three different approaches on how to calculate the price of a stock, as follows: first, we will be using the perpetuity formula to calculate the price of stocks with zero growth dividends; next, we will be learning about the Gordon Growth Model to calculate the price of stocks with constantly growing dividends; in the third video, we will be using the present value formula to calculate the price of stocks that have multiple stages of different growth rates; and in the final video, we will be deriving the Gordon Growth Model. For now, let's get started with the perpetuity approach.

Video at 00:51

In the stock market, investors are able to see the market prices of all the publicly traded stocks, kind of like how, when you're online shopping, Amazon lists the prices of all their products. But you may wonder "how did the market come up with these prices?" How does the market know that the price of Facebook's stock is, say, \$177 per share, and what if, as an investor, you think that Facebook is actually worth more than \$177, making the going market price a great deal. Or the opposite, you think that Facebook should be worth less than \$177, making the going market price a huge ripoff. These questions all get to the core of today's video: valuing the worth of a firm's equity by calculating the share price.

Video at 01:36

Let's start off with the most straightforward method of valuing the price of a stock, which is to apply the perpetuity formula. In one of the first lessons in Finance, we learn how to discount a series of cash flows over time to today's dollars in order to calculate the price or value of these cash flows. The present value represents the value of all the future cash flows in today's dollars. We can model stocks in the same way.

Video at 02:02

Recall that preferred shares are a type of shares that have no voting rights, but have priority over the common shares for when firms pay dividends. In this sense, the shareholders of

preferred shares can anticipate a relatively steady stream of dividends, which are usually paid at the end of each quarter. By assuming, as many shareholders do, that the dividends are paid each period and by discounting these dividends all back to today at a discount rate r_E (the cost of equity), we can calculate the present value of all the dividend payments. This present value tells us how much the share is worth. It is the price tag to let investors know that, for one unit of this firm's equity, this is today's value of all the expected future dividends,

Video at 02:45

As long as the shareholder holds on to the preferred share forever, he can continue to expect these periodic dividends. This stream of cash flows is a perpetuity: a stream of fixed payments delivered at fixed intervals for, well, forever. Recall that the present value of a perpetuity can be calculated using the following formula:

$$\text{present value of perpetuity} = \frac{C}{r}$$

"C" is the dollar amount of the periodic cash flows which, in the case of stocks, the cash flows are the dividends, so you will often see this formula use the letter "D" instead of "C" to represent dividends. The discount rate for the dividends is r_E (the cost of equity) which represents the appropriate discount rate that takes into consideration the riskiness of the firm's equity relative to the entire stock market. If you are curious about how r_E is calculated, please refer to the videos on CAPM and Beta ("Security Market Line and the Capital Asset Pricing Model" and "CAPM: Beta").

Video at 03:38

For example, let's pretend you're a preferred shareholder of Facebook, who expects to receive quarterly dividends of \$5 forever, and you calculate that the quarterly effective discount rate for Facebook's equity is 2.82%. Thus, the value of your preferred share, which captures the value of all the future dividends that you expect to receive from owning this share forever is

$$\text{present value of perpetuity} = \frac{C}{r} = \frac{\$5}{0.0282} = \$177$$

Video at 04:05

Note that firms are not legally obliged to place shareholders any dividends, which is why dividends are called "discretionary". For common shares, where dividends may not be paid every period, calculating the present value (or price) of the share is far more difficult, as the

shareholder must first predict when the dividends will be paid, and then individually discount the dividends back to today, if the dividends are to be paid at irregular intervals of time. The concept of calculating the present value of a common stock by individually discounting all the dividend payments is called the Dividend Discount Model.

Video at 04:41

Before we continue, let's recap what we have learned about calculating the price of a stock with constant dividends. First, we reminded ourselves that the price of a stock is equal to the present value of the future expected dividend payments; therefore, for stocks that are not expected to grow, we borrow the perpetuity formula to help us calculate the price of these stocks with zero-growth dividends. Well that wraps up part 1 on how to calculate the price of a stock using the perpetuity formula. Stay tuned for parts 2 to 4!