The Value of common stocks

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Introduction

Value, like beauty, is in the eye of the beholder.

Firms obtain their long-term sources of equity financing by issuing common and preferred stocks. The payments of the firm to the holders of these securities are in the form of dividends. In general, the intrinsic value of an asset is the present value of the stream of expected cash flows discounted at an appropriate required rate of return.

The value of a company's stock is closely linked with its performance. The better the performance, more optimistic the investors will be and hence willing to pay a higher price for the company's share and vice versa. At different times there is different level of investor optimism. For example, the economy or the company may not appear profitable at one time, but may start to look profitable and the company's share price will start climbing. Due to these phenomena, the value of a company's share fluctuates and investors try to benefit from this fluctuation by making careful investing decisions. In order to make wise decisions, investors need to compare the current market price of a share with the share's real worth determined under different valuation models. As compared with bond valuation, stock valuation is more complex because:

1. The future cash flows are not certain. In case of bonds we have certain payments but in case of common stock, the dividends are not predictable.
2. The investment has no maturity.
3. The rate of return cannot be easily determined.

But like bond valuation, stock valuation also centers around the time value concept of future cash flows. In the case of bonds, the future cash flows were the coupon payments, in the case of common stock, these are called dividends. The cash payoff to owners of common stocks comes in two forms:

1. cash dividends
2. capital gains or losses

How to value common stocks

The first way to figure out the value of common stock is to use the present value of future dividends. In this case, the present value of the stocks would equal future dividends divided by the required rate of return.

Each investor has some base rate of return called required rate of return, (r) which they require considering the riskiness of the stock under valuation and the opportunity costs of the investor. They are also called opportunity costs of capital.

$$Expected\ return\ = r = \frac{DIV_1 + P_1 - P_0}{P_0}$$

On the other hand you can change the formula using given forecasts of dividends and price calculating the price P_0:

$$Price\ =\ P_0\ = \frac{DIV_1 + P_1}{1 + r}$$

To give a more detailed calculation of the Price P_0 we need to calculate further future stock prices and dividends:

$$Price\ =\ P_0\ = \frac{DIV_1}{1 + r} + \frac{DIV_2 + P_1}{(1 + r)^2}$$

The valuation philosophy is just a method of discounting the future cash flows to get the present value and that present value is then treated as the intrinsic value of the stock. This model allows us to look as far in the future as we want. If we call the final period H we get a general formula to calculate P_0:

$$Price\ =\ P_0\ = \sum_{t=1}^{H} \frac{DIV_t}{(1 + r)^t} + \frac{P_H}{(1 + r)^H}$$

As common stocks do not expire of old age, period H could be infinitely distant. The value of shares of common stock, like any other financial instrument, is often understood as the present value of expected future returns. The value of a stock is equal to the stream of cash payments discounted at the rate of return that investors expect to receive on other securities with equivalent risks. Common stocks do not have a fixed maturity; their cash payments consist of an indefinite stream of dividends. Therefore, the present value of a common stock is

$$Price\ =\ P_0\ = \sum_{t=1}^{\infty} \frac{DIV_t}{(1 + r)^t}$$

Stock Valuation is more difficult than bond valuation because stocks do not have a finite maturity and the future cash flows and dividends are not specified. Therefore, the techniques used for stock valuation must make some assumptions regarding the structure of the dividends.

A constant growth stock is a stock whose dividends are expected to grow at a constant rate in the foreseeable future. This condition fits many established firms, which tend to grow over the long run at the same rate as the economy, i.e. fairly well. The value of a constant growth stock can be determined using the following equation:

$$Price \; = \; P_0 \; = \frac{DIV_1}{r - g}$$

where

g = the growth rate in dividends, and
r = the required return on the stock, and
g < r.

The constant growth stock equation can be rearranged to obtain an expression for the expected return on the stock as follows:

$$Expected \; return \; = r = \frac{DIV_1}{P_0} + \; g$$

The expected return equals the Dividend yield (DIV_1/P_0) plus the rate of growth in dividends. The hard part is to estimate g, the expected rate of dividend growth. One option is to consult the views of security analysts. An alternative approach to estimating long-run growth starts with the payout ratio, the ratio of dividends to earnings per share (EPS):

$$Plowback \; ratio = 1 - Payout \; ratio = 1 - \frac{DIV}{EPS}$$

$$Return \; on \; equity = ROE = \frac{EPS}{book \; equity \; per \; share}$$

With these to formulas we can define the dividend growth rate (g) as:

$$Dividend \; growth \; rate = g = Plowback \; ratio \; x \; ROE$$

Although the simple constant-growth DCF formula is an extremely useful rule of thumb, it is not more than that. It often can lead to over or underestimations of growth and therefore lead to bad investment decisions.

Therefore we need to have a decent look at varying growth rates or so called non-constant growth stock valuation. Many firms enjoy periods of rapid growth. These periods may result from the introduction of a new product, a new technology, or an innovative marketing strategy. However, the period of rapid growth cannot continue indefinitely. Eventually, competitors will enter the market and catch up with the firm.

These firms cannot be valued properly using the Constant Growth Stock Valuation approach. This section presents a more general approach which allows for the dividends/growth rates during the period of rapid growth to be forecast. Then, it assumes that dividends will grow from that point on at a constant rate which reflects the long-term growth rate in the economy. Stocks which are experiencing the above pattern of growth are called non-constant, supernormal, or erratic growth stocks. The value of a non-constant growth stock can be determined using the following equation:

$$Price \ = \ P_0 \ = \frac{DIV_1}{1+r} + \frac{DIV_2}{(1+r)^2} + \frac{DIV_3 + P_3}{(1+r)^3}$$

Assuming, that growth rates in period 1 and 2 are different and the growth rates from period 3 onwards are constant, we receive a DCF calculation with 3 stages where we add continuity from stage 3 on to infinity:

where

$$P_3 = \frac{DIV_4}{r-g}$$

$$P_0 = \frac{DIV_1}{1+r} + \frac{DIV_2}{(1+r)^2} + \frac{DIV_3}{(1+r)^3} + \frac{1}{(1+r)^3} * \frac{DIV_4}{r-g}$$

Summarizing you can say that the formula of constant dividend growth rate is an acceptable assumption for mature, low risk firms, but for many firms, near-term growth is unsustainably high. In that case you have to use the multi-stage DCF formula which allows multistage growth rates and valuations.

As we all know, investors do not only consider dividends as possible opportunities. Investors separate growth stocks from income stocks. They buy growth stocks primarily for the expectation of capital gains, and they are interested in the future growth of earnings rather than in next year`s dividends. The buy income stocks primarily for the cash dividends.

As we did take look at dividends we will now take a decent look at the growth opportunities of investments and their reaction concerning stock prices.

If a firm does not grow at all, meaning that all earnings are paid out as dividends, the expected return is also equal to the earnings per share divided by the share price. The price equals:

$$Price \ = \ P_0 \ = \frac{DIV_1}{r} = \ \frac{EPS_1}{r}$$

If there is a business opportunity to reinvest in instead of paying out all earnings, it is important that the new project`s NPV is at least 0. Therefore the we have to note that the earnings-price ratio, measured in terms of $EPS_1$, next year`s expected earnings, equals the market capitalization rate only when the new project`s NPV = 0.

A third method that can be used to figure out the value of common stock is more complex than the other methods. You need to look at two things, the current activities of that stock and the value of growth opportunities. To figure out the current activities or earnings, you will need to have the earnings per share of stock, also called EPS.

You will also need to find out the value of growth opportunities for the stock, which is also referred to as PVGO, present value of growth opportunities. To find the PVGO, you will need to know the last dividend that the company paid to stockholders and the future rate of return.

In general you can think of stock price as the capitalized value of average earnings under a no-growth policy, plus PVGO, the net present value of growth opportunities:

$$Price \ = \ P_0 \ = \frac{EPS_1}{r} + \ PVGO$$

Therefore the earnings-price ratio equals
$$earnings - price\ ratio \ = \frac{EPS_1}{P_0} = r * \left(1 - \frac{PVGO}{P_0}\right)$$

The ratio EPS_1/r is the capitalized value of the earnings per share that the firm would generate under a no-growth policy. PVGO is the net present value of the investments that the firm will make in order to grow.

$$present\ value\ of\ growth\ opportunities = PVGO = \frac{NPV_1}{r - g}$$

Therefore the share price is:

$$\text{Share price} = $$
$$\text{PV of level stream of earnings} + \text{PV of grwoth opportunities}$$

So growth stocks are so called because the net present value of its future investments account for a significant fraction of the stock`s price. Stock prices today reflect investors´ expectations of future operating and investment performance. Growth stocks sell at high price-earnings ratios because investors are willing to pay now for expected superior returns on investments that have not yet been made.

The same formulas that we used to value common shares can also be used to value entire businesses. In this special case we do not discount dividends per share but the entire free cash flow generated by the business. As we learned before, a two-stage DCF model is the best solution. Free cash flows are forecasted to a horizon and then discounted to present value. Then a horizon value is forecasted, discounted and added to the value of the free cash flows. The sum is the value of a business. To get the present value of a business we use the following formulas:

$$PV = \underbrace{\frac{FCF_1}{1+r} + \frac{FCF_2}{(1+r)^2} + \cdots + \frac{FCF_H}{(1+r)^H}}_{\text{PV (free cash flow)}} + \underbrace{\frac{PV_H}{(1+r)^H}}_{\text{PV (horizon value)}}$$

$$PV\ (business) = PV\ (free\ cash\ flow) + PV\ (horizon\ value)$$

Conclusion

The dividend discount model is a useful heuristic model that relates the present stock price to the present value of its future cash flows in the same way that a bond is priced in terms of its future cash flows. However, bond pricing is a more exact science, especially if the bond is held to maturity, since its cash flows and the interest rate of those cash flows are known with certainty, unless the bond issuer defaults. The dividend discount model, however, depends on projections about company growth rate and future capitalization rates of the remaining cash flows. For instance, in a bear market, the capitalization rate will be higher than in a bull market—investors will demand a higher required rate of return to compensate them for a perceived greater amount of risk. Getting either the capitalization rate or the growth rate wrong will yield an incorrect intrinsic value for the stock, especially since even small changes in either of these factors will greatly affect the calculated intrinsic value.

Furthermore, the greater the length of time considered, the more likely both factors will be wrong. Hence, the true intrinsic value of a stock is unknowable, and, thus, it cannot be determined whether a stock is undervalued or overvalued based on a calculated intrinsic value, since different investors will have a different opinion about the company's future.

So while it is obvious that stocks are priced according to the market's expectations of future cash flows from owning the stock, both as to dividends and future stock price, there is no way to ascertain exactly what that true intrinsic value is.