

Lecture notes Asset Pricing and Capital Budgeting Lecture 4 9 May 2016

Stock markets

Some of the largest stock markets are NYSE, NASDAQ and Euronext. A stock market is large when its market capitalization is more than one trillion. The major stock market indexes are the Dow-Jones index, Standard & Poor's 500 index and the Dutch AEX index. The Dow Jones is used a lot but is actually not a very good measure because it is a nonvalue-weighted index, it does not take the true value of the stocks in account but only the price. The standard & Poor's 500 index does give you a good impression of the value of the 500 largest stocks of US exchanges. AEX is determined by the 25 most important (most traded) stocks in the Netherlands. Because we do not want one firm to have too much weight, very large companies that would influence the outcome too much are weighted less. Therefore, Royal Dutch is only counted for 64 percent. Also the AEX is a value-weighted index.

Stock valuation

There is a theoretical difference between value and price of stocks. It is argued that price and value are the same, since in a good working market prices are set through demand and supply and thus should the price represent the value of a stock. However, the two are often different. The value of a stock is determined by the valuation model:

Later on we will discuss where the formula comes from, today we will just assume it. This valuation model is based on estimates. The price on the other hand, is determined by observing the prices in equity markets.

A real life example is the stock price of Coca Cola, the current price is \$45. How do we determine whether this price coincides with the value? There exist three different stock valuation models: The Dividend Discount Model, The Discounted Free Cash Flow Model, and the Multiple Approach.

Dividend Discount Model

General formula:
$$P_0 = \sum_{t=1}^{\infty} \frac{Div_t}{(1+r)^t}$$

Constant dividend:
$$P_0 = \frac{Div_1}{r}$$

Growing dividend:
$$P_0 = \frac{Div_1}{r+g}$$

In the case of Coca Cola, this would give us a stock value of $\$1.40 / (0.07 - 0.04) = \46.67 , if the expected dividends in this year are \$1.40, the required return on equity 7% and the expected growth in dividends 4%

Returns that can be obtained on the financial market (R_e) can be seen as an opportunity cost, they show how profitable the firm should be and are therefore very useful for management decision making. Investing money is a good decision when the return the firm generates on this new investments (R_{ONI}) is larger than R_e .

The Discounted Free Cash Flow Model

Stock value = Equity Value / Outstanding shares

Equity value = Enterprise value + Cash- Debt

$$\text{Enterprise value} = \sum_{n=1}^N \frac{FCF_n}{(1+r_n)^n} \quad (\text{Sum of the present values of the FCF's})$$

When we apply these formulas on Coca Cola, we get: Stock value = $192,85 / 4.33 = 44,54$

Multiples

The third method is rather easy and quick; you can estimate the value of the stocks with various different multiples. You can use these ratios to compare a company to another, or you can for example use the ratio for the whole industry and compare it to your firm. Some important ratios are:

P/E: Share price/ earnings per share, the earnings per share embedded in the price.

P/B: Share Price / book value of equity per share

P/CF: Share Price / free cash flow per share

EV/EBIT: Enterprise value / EBIT (earnings before interest and tax)

Let's apply these on Coca Cola:

When P/E = 23.9 and the earnings per share for Coca Cola in 2016 are &1,67 the value of the stock is equal to $1.67 \times 23.9 = 39.91$.

When P/B = 8,1 and the book value of equity per share of Coca Cola is equal to \$5,91, then the estimate for the value of the stock is $5.91 \times 8.1 = 47.87$

The different methods for estimating the value of a stock thus all give a different result. Furthermore, the P/E ratio is very strongly negatively related to the 20 year annualized returns. So, the higher the aggregate P/E, the lower the consecutive 20-year stock returns. Thus when you are a very long-term investor this might not be the right time to invest. This makes sense, if something is cheap it is more likely to bring high revenues.

Efficient markets

Proponents of efficient markets argue that these value estimates are a waste of time, markets are efficient processors of information and therefore prices must be equal to the value of stocks. There are three forms of market efficiency distinguished:

- Information about prices can be found in past prices
- Everybody has access to information about stock pricing, this is public information
- Only insiders with specific knowledge have information about stock prices, this is Private information

However, many argue that price is not equal to value. Findings from the behavioral finance literature indicate that hypothesis that the value is equal to the price may not always hold. This might mean that the markets are inefficient and the model is correct, or that the model is incorrect. This issue is called the joint hypothesis problem. Prices may sometimes deviate from fundamental value but taking advantage of this proves to be rather difficult, in general most markets function quite well and are good indicators of the value of a stock.