FINANCIAL MANAGEMENT | ADVANCED

Video Transcription: Dividend Discount Model

The valuation of ordinary shares of a company is much more difficult than the valuation of bonds, debentures, and preference shares. This is mainly because ordinary shares have a greater deal of risk relating to future cash flows.

As a shareholder you will receive dividends in the future, and we need to work out and determine the value today of those future dividends. Of course you could say, well you're not going to hold the shares for a very long term. You might be selling them in 3 years time. However, the person buying from you is also going to be thinking about future dividends, and the person thereafter, and so on. Essentially, the value of a share will be equal to the present value of future dividends.

How we determine future dividends is also based on understanding the business. The company may be paying a dividend currently, and this dividend will tend to grow over time. Now, we need to determine what that growth rate is. If the growth rate is constant, we expect a generally constant growth rate in dividends – then we can use a very simple growing perpetuity formula to determine the value of the firm.

This is basically the present value, which is equal to D1, which is your current dividend multiplied by one plus the growth rate divided by cost of equity (k) minus the growth rate (g). That gives us the value of equity. Of course, if we are expecting that the dividends will grow by a certain rate (which may be higher than the long term growth rate), what we can do is, we can divide this valuation process into 2 periods. The first period we specifically determine what each dividend is going to be. Let's say that for example, the next 5 years we can determine exactly what the dividends are going to be and thereafter, at the end of 5 years, we will basically calculate the value of the future dividends at that time assuming a lower and sustainable growth rate that is going to occur into the future from that point in time.

It is important to understand what is driving the dividends. The dividends are going to be driven mainly by earnings. So for example, we cannot have a situation where earnings are growing by 10%, but dividends are growing by 20%. That is not sustainable in the longer term. We can do this for a little while, for a few years, but we can't do that in the longer term. So, I always look at the rate of growth in earnings per share as well as dividend per share to get an understanding of what the sustainability of the growth rate is.

Secondly, we need to understand what's driving the business. For example, if we see that interest rates are rising, this could place downward pressure on the sales growth rate of retailers for example, and therefore we would expect that this would tend to reduce earnings and therefore, in the longer term, reduce the growth in dividends (even though some companies will resist reducing dividends).

What I want to do now is take you through a practical example. I'm going to try and apply the dividend discount model process to valuing Woolworths. We are going to be estimating what are the future dividends of Woolworths, and we are going to be discounting those future dividends by the cost of equity of Woolworths. This is not the same as the cost of capital, it's the cost of equity. What's the expected or required return that the shareholders expect? What's the required return of shareholders when they invest in Woolworths?

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So, the first thing to do is to try and estimate what the long term growth rate in dividends will be for Woolworths. Now, we will look at sales, earnings, sales growth, and earnings growth. Remember that Woolworths is expected to open up new stores as well as generate sales from existing stores. The group also operates and has subsidiaries in Australia. But we are going to try and simplify this. If we look at a company like Woolworths, we'd expect that it would at least match inflation growth. Now, if we take inflation growth to be about 5.5% (and let's assume that we think Woolworths would achieve about 3.5% in real growth, which may be close to general economic growth rate over time), then we can say that in nominal terms we would expect, in the long run, that Woolworths could grow at about 9% per year.

The next question is to determine what Woolworths' cost of equity is. Again, we are simplifying because we want to try and focus on the dividend discount model. We could say that the risk free rate is, let's say 9%, and you know a company must at least give its shareholders the risk free rate, which in South Africa's case we could take a government bond yield and that could be at the moment around 9%. We could say that the risk premium should be between 4%–6% probably. We are going to take 4.5%. So we can say that we would expect the cost of equity of Woolworths to be around 13.5%. I know that Woolworths' financial statements indicates that the group's weighted average cost of capital is 12%, but we would expect the cost of equity to be a little bit higher than this even though they have a very conservative capital structure.

So, if we apply the growing perpetuity formula to value the shares in Woolworths, then we can see that the dividend in the current year (2015) is R2.47. So, if we are expecting a growth rate of 9%, then we would expect that the dividend in year one will be 2.692. We then divide this by the cost of equity minus the growth rate (which is 13.5% minus 9%), which is 4.5%. If we divide 2.692 by 4.5% we get to a value of R59.83.

Now, let's look at the share price of Woolworths. If you look at the graph you can see that the share price of Woolworths has gone up dramatically until it hit about R100, and it's been coming down a little bit after that but esentially it's hit R100. And so, what we're going to do now is, we're going to look at the value. If you look at the current value, you will see a value of R100, and you look at our value of R59 (which is very close to R60) we realise that investors and shareholders are expecting the company to achieve a higher growth rate, at least in the medium term.

So, the next model I'm using is basically I'm going to use a higher growth rate for a number of years, and then we're going to be reducing the dividend growth rate and expect dividends to grow at a lower rate after that date. So, I have set out the earnings per share and dividend per share for Woolworths from the period 2009 to 2015, and I've used 2010 as the base because 2009 is not representative (because they paid a special dividend in that year). We can work out that in fact, the growth rate in earnings per share over that 5 year period has been 16.8%, but dividends have grown by 19.8%. Again, because they have intended to increase the dividend payout ratio, this is not sustainable. I think that earnings growth is 16.8%. If we look at the growth rate in just the last 3 years, it's tended to come down, but that's the kind of growth rate that Woolworths has been able to earn and generate for its shareholders.

So, what I'm going to do is, for the first period, for the first 5 years –2016 to 2020 – I'm going to assume that the company is going to grow at a rate of 16%. I think this is relatively high. I am concerned that perhaps this is too high, but this reflects what they have been able to achieve, at least in earnings growth, over the last 5 years. What we are going to do is assume that they are able to generate this growth rate for the next 5 years. This may be over-optimistic and I will come back to that later on. If we do that, then the dividend per share in 2016 is expected to be 2.86, in 2017 it is 3.32, and going up to 2020 which is 5.188. Now, at the end of 2020 we expect that the high growth phase of dividends for the shareholders of Woolworths will come to an end. Thereafter, we expect that dividends should grow at the rate of about 9%; a nominal growth rate of 9% per year. We then determine what the value is at the end of 2020. And that's basically the dividend expected in 2021, which is 5.65492, and that is 5.188 multiplied by 1.09 and again we divide that by the cost of equity of 13.5% minus the growth rate of 9%. That gives us a value at that point in time of R125.66.

So, those are the dividend cash flows in each year. We then discount it back at the cost of equity, which we'd assumed to be about 13.5%, and we get to a value of R79.91. Now this is less than the share price of R100. The share price has come down, but if we look at the share price it's around R90 (March 2016), so we would value Woolworths at less than the share price around the time we did this. Now, remember that everyday things change. Interest rates could fall, sales could increase dramatically, but based on the information that we have at the end of 2015, we would expect the value of the share to be around R80.

Now, the next thing I've done is, I've looked at sensitivity analysis. What if we changed the constant growth rate, the risk premium that's used in the cost of equity, or what would happen if we assumed a non-constant growth rate, of 13% instead of 16% or perhaps 19%? The values will generally range between R63 and R100. Generally, on the lower side it varies from R63.56 to R70.71, and on the high side from about R90 to about R103.

So we can say that the current value is about R80, and based on our valuation the current share price is higher than that but based on, I think, these reasonable estimations we would not expect the share price to be above R100 (and it will definitely be closer to R80 over time). Now, over time these things do change, but it's important to have time value of money adjustments to compare R80 in 2015 to a year later. Essentially that gives us a perspective and enables us and tells us that we can actually do this. We can use this to value real companies, and the values we're getting based on what I would say are reasonable inputs is not something that is totally out of line with what we would expect.

Thank you.

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