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Video Transcription: Free Cash Flow Valuations

Hi, my name is Carlos Correia, and today I am going to take you through the discounted cash flow model of valuations. This is also known as the free cash flow model. Essentially there are two main ways of undertaking valuations. We can either apply multiples, like the price earnings ratio, or we can determine the present value of future cash flows. Now, in a discounted cash flow model we are going to focus on operating cash flows, and so we are going to focus on valuing the business.

So what we are essentially saying is that the value of the firm is equal to the present value of future operating cash flows, and then we deduct the market value of the debt to arrive at the value of equity. So how do we start? Firstly, we need to project what the future operating income is going to be. Now, we may decide to begin by forecasting sales. We need to, for example, project what we think the future sales growth is going to be.

Once we have done that, we can then determine what we think the operating income is going to be. Now companies may, for example, be achieving an operating margin of say, 12%, and so we can then apply this margin to future sales to determine what we think the operating income is going to be. So we are going to begin with earnings before interest and tax, and what this means is:

- We are going to exclude interest income;
- We are going to exclude interest expense;
- We are going to exclude gains or losses from discontinued operations; and
- We are going to exclude investment income from non-operating investments.

We need to determine what the tax is going to be on the operating income. Now remember that the tax charge in the financial statements is essentially an integration of any tax relating to financing flows and any tax relating to operating cash flows. Now, one way of determining what the tax on operating income is essentially to say, what is the current tax charge, and then basically work out what the tax shield on interest expense is, which means that we have to increase the tax by that amount. If there is interest income, then we have to reduce the reported tax charge by the tax on interest income. Or, we could simply determine that the tax and operating income is simply EBIT (earnings before interest and tax) multiplied by the marginal tax rate.

If we are projecting changes in deferred tax liabilities, then we need to take this into account. What this is in effect doing, is moving what we think the tax is going to be, on a marginal tax rate basis, to what the tax is going to be on a cash tax basis. So for example, we could be moving from a marginal tax rate of say 28% to a lower effective rate, because there is a difference in the tax treatment of capital tax allowances versus accounting depreciation and so on. We don't have time to go into that, but essentially, if you are projecting changes in deferred tax liabilities, then you may need to include that change to get your tax back to cash tax.

So, if we look at the process we go through, we are really starting with projecting what operating income is after tax and we then have to add back depreciation and amortisation. The reason we do this is because these are non cash flow items, and we are trying to get to operating cash flow. We then have to deduct (sometimes we add), but normally we deduct any change in working capital. So as the company is growing, it will need increased levels of working capital.

We also need to take capital exenditure into account. So, as the company is expected to grow in sales, we would expect that the firm will continue to invest in capital expenditure.

To summarise:

1. We project operating income;
2. We project what we think the tax is going to be on the operating income;
3. We add back depreciation and amortisation;
4. We deduct working capital; and
5. We deduct capital expenditure to arrive at the cash flows that we are going to be estimating for each year, let's say for the next five or ten years.

The next question is, how do we determine what working capital is going to be? We focus on operating working capital, which means that we take into account changes in inventories, changes in accounts receivable, and changes in cash needed for operations. We then have to deduct accounts payable and any provisions that arise in the normal course of business. Normally we will project working capital – and often net working capital – as a percentage of sales. We also need to take into account any possible improvement or restructuring that could lead to a reduction in inventory levels or accounts receivable, or changes in the number of days taken to pay accounts payable.

So for example, inventory could currently be 11% of sales, and we think that we can reduce our inventory levels to 8% of sales, then we would probably take that into account. The other thing that you need to be careful about is you need to exclude any excess cash. Excess cash needs to be added to the value of the firm, but not to the value of its operations. We don't need the cash to generate operating income, and so we have to exclude any excess cash from forcasting working capital. We need to take into account provisions that arise in the normal course of business, as this is going to reduce our net working capital required to finance future operations.

Essentially what we are going to be doing is projecting operating cash flows, let's say for the next 10 years, and discount these cash flows so that we determine the present value of the cash flows during what we call the "explicit period". But then we have to also determine what we think the terminal value will be at the end of ten years, or otherwise called the "continuing value". This the present value of cash flows after the explicit period.

So we will add the present value of cash flows during the explicit period, plus the present value of cash flows after the explicit period to arrive at the value of the firm.

So, to summarise, the cash flows that we are going to be discounting are made up of net operating income after tax, plus depreciation, minus capital expenditure and less any increase in net working capital. So, let's look at an example:

We are going to value a retail company. The corporate tax rate is 28%, the weighted average cost to capital is 11%, and we are projecting that sales will grow by 14% until 20X7, and after 20X7, it will grow by 6% per year.

We are expecting that earnings before interest and tax will be 12% of sales, but from 20X8, because of increased competition, we expect that the EBIT margin will come down to 9%. Net working capital as a percentage of sales is expected to be 16%, depreciation to the opening net book value (this is basically property, plant and equipment (PPE)) is 8%, and net book value of PPE to sales is 20%.

Current sales is R600 million and we are expecting that to grow over time. Operating income is 12% of sales during the explicit period. We are going to make the tax simple, so the tax on operating income is 28%, and then we are going to add back depreciation to basically arrive at what we call gross cash flows of 6R8.698 million in 20X4 and R78.315 million in 20X5 and so on.

We then need to take into account the increase in net working capital, as well as the capital expenditure. We are going to be using an explicit period of only five years in order to simplify matters. If we include net working capital and capital expenditure, we will then determine free cash flows to be R28.858 million in the first year, and R32.898 million in the second year, growing to R47.718 million in the fifth year. We then discount these cash flows to arrive at the present value of the cash flows over this explicit period.

If we focus on working capital, that working capital is R96 million at the end of 20X3, which is the current date. Because sales will be growing, we expect that working capital will also grow to R109.44 million in the next year. This requires that we invest, for example, in 20X4, an amount of R13.44 million in net working capital. This growth in working capital is a cash outflow. Remember, we are not looking at levels, we are looking at the change in working capital, and the change in net working capital is also growing over time until it reaches 20X8. Because the growth rate in sales from 20X7 to 20X8 is only 6%, this requires us to invest less in net working capital.

In the case of capital expenditure we can see that, if you look at the change in net book value, it will grow from R120 million to R136.8 million, and we could record that increase in PPE as a cash flow. However, the cash flow that we have spent is actually greater, and we need to add back the depreciation. In fact, the cash flows on capital expenditure (capex) is 26.4 million, because the PPE balance has been reduced by the 9.6 million in depreciation. So to get back to cash flow, we need to add back the depreciation to the change in the PPE balance.

At the end of the explicit period, we need to determine what the firm's terminal value is. We use a growing perpetuity formula, which is really the free cash flow in 20X8, and which we multiply by one plus the growth rate, which is 6%. And so we multiply by 1.06. We then divide this by the weighted average cost of capital, which is 11%, minus the growth rate of 6%. If we apply this formula, we will see that we expect the terminal value at the end of year five to be just over R1 billion, which is R1011.62 million, and the present value of that terminal value is R600.347 million. So we are going to basically add the present value for year one to four's cash flows, plus the present value of year five's cash flows, plus the terminal value to arrive at the value of the firm, which is what we also call enterprise value ,and in this case, this is R736.948 million.

We would determine from the financial statements at this point in time, which is at the end of 20X3, that in fact the firm owes R320 million to its bankers. And so to arrive at the value of equity, we need to deduct this from the value of the firm, and so we arrive at a value of R416.948 million, which represents the value of the ordinary shares of the firm. We will assume that the number of shares in issue is R280 million, so we divide by the number of shares to arrive at the value per ordinary share of R1.49. This example is the example that I have in the Financial Management textbook, so you can refer to the textbook to obtain greater clarity about some of these issues, but essentially that presents an example of the application of the discounted cash flow method to valuations. Thank you.