Mergers, Acquisitions and Corporate Restructuring
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Lecture - 15
Valuation in M and A: Cash Flow Based Approach – 4 (Dividend Discount Model) (Continued)

Hello friends, welcome to one more session on mergers, acquisition and corporate restructuring. In this session we will continue with valuation exercise. We are in the last session, we talked about different methods evaluation and also tossed upon the free cash flow approach or valuation. So, in this particular session we will discuss more about the free cash flow approach for valuation.

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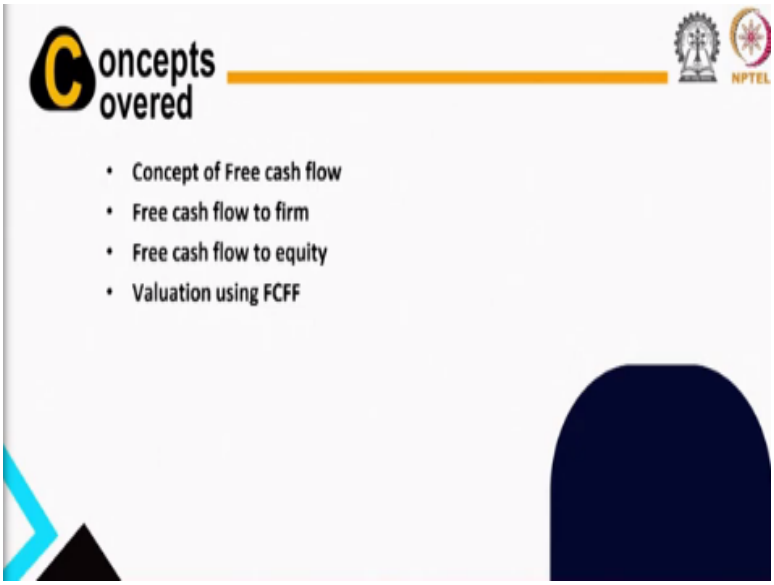

And the concept that we are going to cover is concept of free cash flow, concept of free cash flow for the form, free cash flow to equity and valuation using the free cash flow approach.

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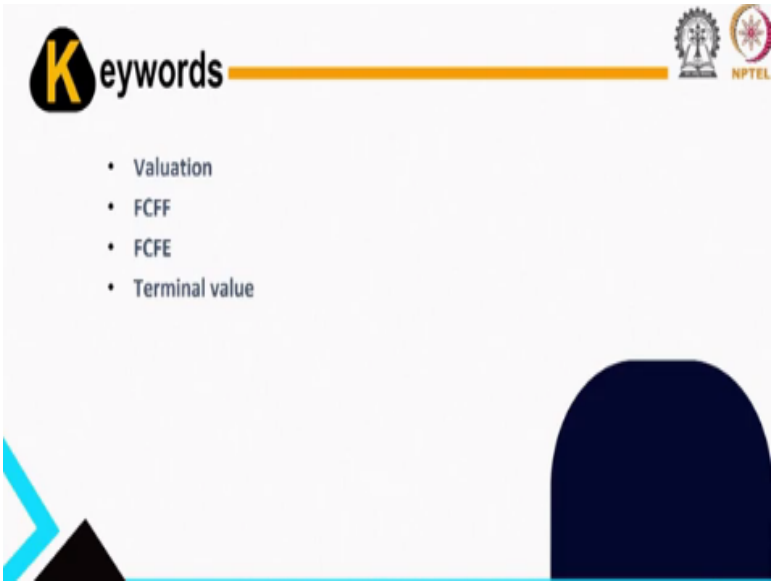

So, the keywords that you have are valuation and FCFF, FCFE and terminal value those are the keywords. We are going to cover in this particular session. This session we will talk about the constructed also do certain exercises small exercises both in the board as well as in the spreadsheet.

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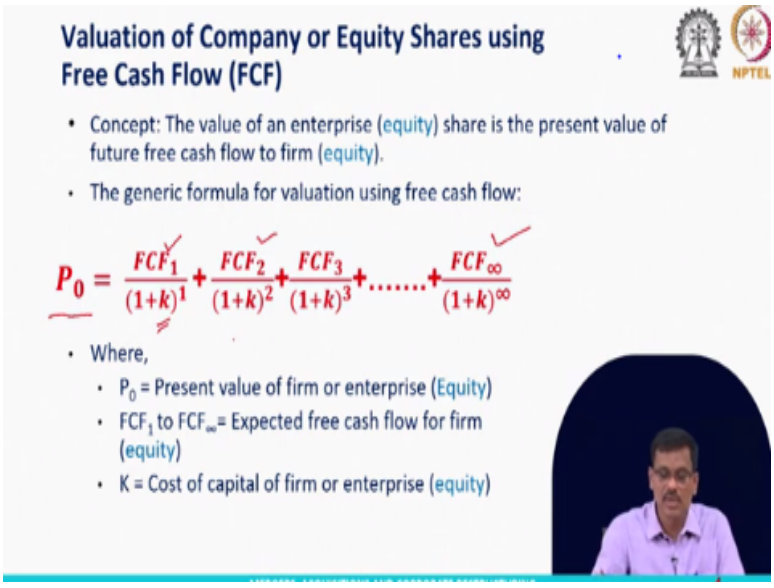

So, we discussed in the previous session that when you talk about the valuation, we can value a company or valuable equity share using free cash flow. So, the concept is that the value of an enterprise or equity a share is the present value of free future free cash flow to the firm or to the

equity holders. So, generic formula is price zero, is today price and we have cash flow one cash flow two up to cash flow infinite period.

So, because the firm is going to be in existence for as many years to come. So, essentially one has to forecast the free cash flow for one is to infinite number of years and then discounted by the appropriate cost of capital. So, if it is a free cash flow to the firm, we discount by weighted average cost of capital, if it is a free cash to the equity then we discounted by cost of equity. So, that is the generic formula like for any free cash flow or cash flow-based model. And then coming the how do you estimate the free cash flow to the firm to the equity.

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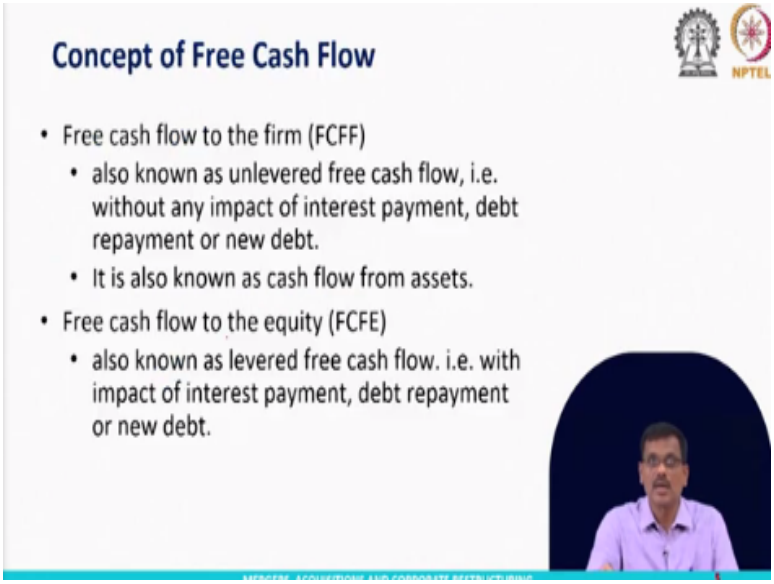

And when you talk about free cash flow for the firm it is also known as unlevered free cash flow. That means it is taking the company or the firm together whether it is a finance pay debt or equity that does not make any difference, irrespective the leverage, leverage means you are talking about financial leverage where companies employed debt in the capital structure. So, we are not considering that we are looking at how much cash flow is generated by the company as a whole from its assets.

So, that is the free cash to the firms that is why it is known as unlevered cash flow. And also, it is known as cash flow from the assets. So, the company has taken the money from investors other lenders or owners the company has put the money in some assets and the assets are supposed to

be generating revenue and then some cost is incurred. And finally, some cash flow to generated because we have invested in cash in the assets.

Similarly, the investors have also given the cash to the company those cash has been **(()) (03:46)** assets and the assets are supposed to generate the cash flow to take care of day-to-day expenses and something left over which is made for the investors to be given back. So, that is what the cash flow that. So, that is called the free cash flow as well nothing else that cash flow entirely belongs to the stakeholders the financial stakeholders lenders and the owners together or shareholders together.

Similarly, we can also find out the free cash flow to the equity only. So, we do not talk about the company as a whole. So, how much free cash flow is generated to for the equity investors. And that money is now free for them to be given as dividend or share buyback whatever that means it is now free for the shareholders to use for their particular purpose. And that cash flow is of course both the cases this cash flows take care of any requirements of the growth of the company.

That is what is called free cash flow. If there is an expansion requirement is there and that some node is required. So, that also has to be used from the cash plus generated in the operation. Then after that is taken care then we can set is a free cash flow. So, free cash to the equity also known as levered free cash flow because already debt related cash flow has been taken care when you calculate the free cash flow for the equity.

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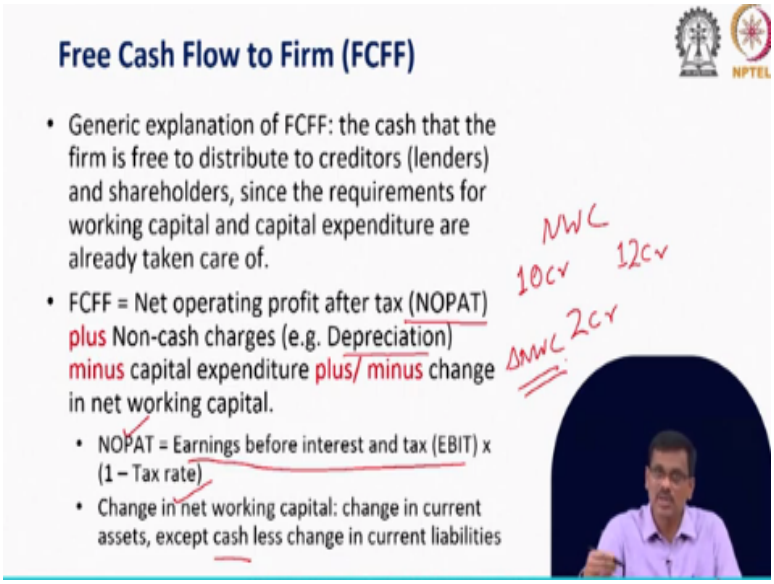

And so, this specific formula yes, a generic explanation is that the cash that the firm is free to distribute to the creditors also known as lenders and shareholders. Since the requirements of working capital, capital expenditure like which are actually meant for the growth of the company has been taken care. So, now the money is the cash flow belongs to the stakeholders that are lenders and the owners.

And the formula that we use for calculating free cash flow of the firm is that we first find out the operating profit after tax which is nothing but earnings before interest and tax into one minus tax that means post tax operating profit EBIT is known as operating profit before tax. And please keep in mind that we do not reduce the interest from this particular thing to find out because interest is taken care by using the free cash flow itself.

So, debt related things are not deducted. So, that is what EBIT into 1 - T that gives a no part. And NOPAT has when you calculate the profit, we have already considered certain non-cash expenses. So, the non-cash expenses has to be removed. That means what you do like for example depreciation. Depreciation is deducted. So, that the company can have some tax benefit but depression does not involve any cash outflow.

So, what happens after you find out the NOPAT, we add back the depreciation and amortization also. Then so, this is the cash flow for the company. And then that gas flow will be used for

taking care of an expansion. So, if the company has any capital expenditure. Suppose the company is going to invested by another plant or facility a set of facility some amount is required. So, that is taken care from this particular cash flow.

Then if there any working capital also required so, extra working capital in terms of current assets adjusting for current liabilities. Then that also has to be taken care from this cash flow then whatever left over that is called the free cash flow for the firm. And we talk about net working capital we are talking about the change in the net working capital and networking capital nothing but current assets minus current liabilities but in the current assets we do not consider cash.

So, it is all non-cash working non-cash current assets less the current liabilities that gives the net working capital and the difference in the net working capital from one you to another year is known as change in the net working capital. So, for example if my net working capital was last year 10 crore and now, I require a net working capital 12 crore. So, 2 crore is the delta net working capital. So, these 2 crores will be used from the cash flow available from the business itself.

Then whatever leftover taking care of capex also whatever left over will be taken as the free cash flow for the firm for the particular year and will have a small exercise also to explain.

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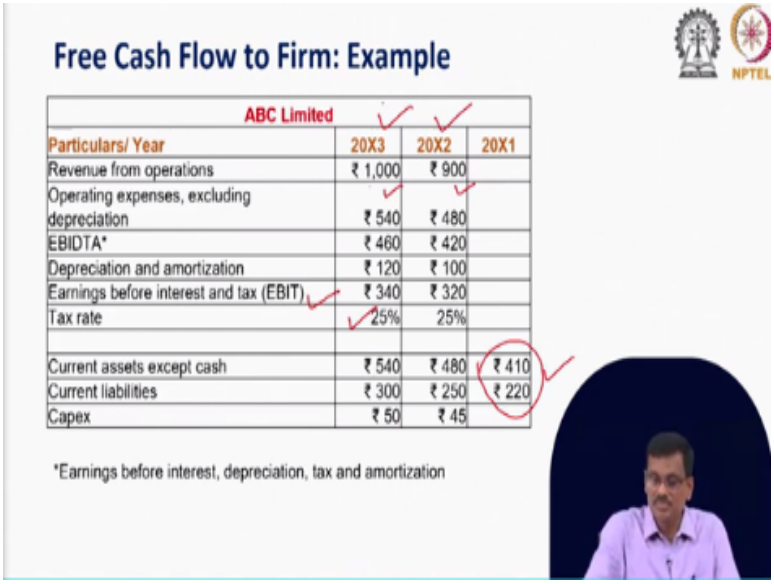

Like this is an example that we have. A company is there that is where the company has a revenue of 1000 crore and 900 crore 900 rupees in the previous year and this year 2000 X3 this is the 1000. The company has operating expenses excluding depreciation like 540 and 480. We have then the revenue minus operating expenses that gives us the earnings before interest depreciation tax and amortization that is a beta.

And so, we have 460, 420 then you have to remove depreciation after removing depression we have earnings before interest and tax. Then the company subject to tax rate to 25 percent. And the company has a current assets except cash of this amount, 2000 X1 to the X2 2000 X that is given. Also, we have what the capex for 2000 X2, 2000 X3. We have to find out the free cast or the firm for 2000 X3 and 2000 X2. And 2000 X1 figures are given only for current assets and current liabilities.

Because we want to know the change in net working capital in 2000 X2. For that we need the figure of networking capital of the previous year. That is why only these two information's are relevant as far as 2000 X1 is concerned. And we have to find out now the free cash flow to the firm for 2000 X2 or 2000 X3. So, what we will do? We will be using this simple spreadsheet to solve this particular problem.

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So, this is the data that reproduced in this spreadsheet here. So, like this revenue then expenses **(()) (10:29)** depreciation. Then a beta depreciation all these things are there and tax percentage is 25 percent and this one. So, what we do here? First of all, let us find out the net working capital as a working node because we need the change in working capital to find out the free cash flow for the firm. So, our net working capital will do it for the all the years.

So, net working capital nothing but current assets minus current liabilities. So, this is the net working capital which was 190 2000 X1. And if you drag it to next two years, we have got the working capital 240 and 230 in 2000 X3 and 2000 X2 respectively. Now, what the change in the networking capital in 2000 extra. Then how much extra networking capital is required in 2000 X2 compared to 2000 X1.

Because 2000 X1 that 190 rupees working capital is already there in the company. But to sustain the operations of this year 2000 X2 we need 230 rupees of net working capital. That means 190 is already existing with us, we need another 40 rupees extra net working capital that was the delta the difference. So, this 40 is my extra working capital which has to be invested from the cash flow available not 230.

So, it has to be careful it is not 230 that is required it is actually 230 - 190 which is required as the investment in networking capital. So, what we do 230 - 190. So, that gives 40 and we drag it. That means we require in 2000 X3 we require another 10 rupees of net working capital which is nothing but 240 - 230. Then coming to the calculation of free cash flow first of all we have to find out the no net operating profit after tax which is nothing but earnings before interest returns EBIT into 1 - tax rate.

So, we have EBIT given here we have already calculated in the data is provided into one minus the tax rate taxes 25 percent. So, we got this answer and then we have to add back the depreciation. So, let us take the depression here 120 for this year. So, that gives us a cash flow operating cash flow before any change in working capital then we remove the capex. So, let us take the capex figure from here which is given 40, 50.

Then change in net working capital that is increase in working capital. We have that is 10 rupees in this year we take this from which we calculated just some time back. And now my free cash flow is no part plus depreciation or we can directly also find out the as you said we already calculate the cash flow. So, equal to 375 that is operating cash flow before working capital changes minus capex and minus change in working at 10.

So, that is what 315 and we drag this to 2000 X1. So, we can now say that, 315 and 255 are the respectively the free cash flow for the two years that is 2000 X3 and 2000 X2. So, that is the calculation asset. And one thing I let me point it out that it is not necessary that always working capital growth will be there. That means you require more working capital. It is possible when the companies is declining. So, the working capital required will be also coming down.

So, in that case the difference for example in a particular year. Let us say year 1 we have 1000 rupees of net working capital. And in year 2 we can do with, let us say 75 rupees of working capital. What does it mean? That means we had 100 rupees working capital we do not need 100 we have only 75, we need only 75. So, the change in working capital is how much? 75 - 100 that is minus 25. What is the implication of this minus 25 here?

That means this much working capital will be released to the system. So, this decrease in working capital leads to positive cash flow whereas increase in working capital leads to negative cash flow. So, here when you talked about this 10. We remove they will remove this working capital change from the cash flow. But here what will happen negative means it actually R to the cash flow. So, the working capital is decreasing it is added to find out the free cash flow.

So, that is something one has to keep in mind. So, this is what the we do this calculation free cash flow for the firm. Then we will take up another example another concept that is called free cash to the equity.

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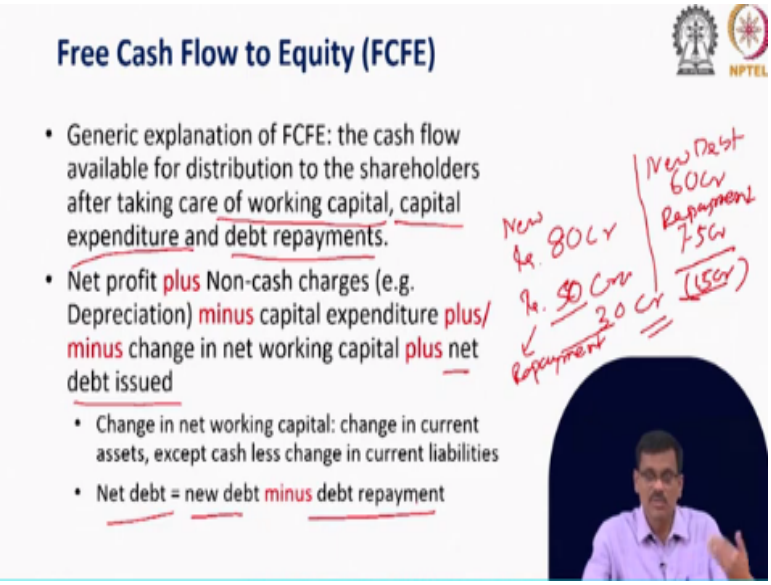

So, when you talk about free cash for equity. It is nothing but the cash flow available for distribution to the shareholders, after taking care of again as earlier in free cash for the firm working capital changes; we also take care of capex. But another thing is that we also take care

of debt repayment because when the cash flow is left over because you are talking about from the point of equity investors.

In that case we have to also take care of the repayment of the loan and payment of interest that has to be removed. But since we are calculating profit after tax which is already removed the interest. So, we do not have to bother the interest itself. We have to look at because principal repayment is not part of your income statement. So, principal repayment debt repayment while borrowing when the borrowing is repaid has to be taken out from the cash flows generated by the business.

So, debt repayment has to be moved and it is possible that company may go for additional borrowing and also at the same price of some repayment in that case you have to look at net. So, if the company has borrowed let us say 80 crore in a particular year. And same year the company has also repaid let us say rupees 50 crore. So, that means the net this is extra this is borrowing, new borrowing this is repayment.

So, in that case 80 - 50, 30 crore cash flow from the borrowing net borrowing is available with the equity investor to use what for whatever that may be. So, when you talk about the date repayments we also, take care of the additional borrowing. So, you talk about net debt, that is why we took about net debt. So, we have change in working capital plus net debt issued. And is also possible in another case that we have taken new debt table let us say 60 crore that is a new debt.

Whereas your repaid let us say 75 crore, that is repayment. That means in this year 15 crore I am keeping bracket to say negative. Then 15 crore net debt has been repaired. In that case it will be a negative thing assessed to that because you have to pay that money to their investor that is called lenders for that matter. So, the emphasis is that we want my net debt, net debt means new debt minus hold it the repayment.

That is a net debt that net debt is the cash flow available for the equity holders for whatever they feel like that.

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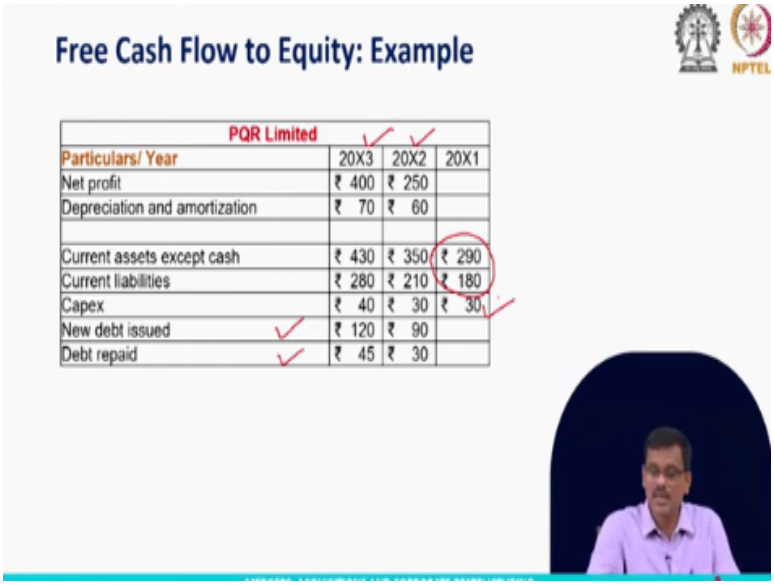

So, let us look at an exercise here. So, this is a company PQR limited which has got different figures we have given here already net profit is there, net profit is given then you have got current assets current liabilities capex company has got new debt issued that was repaired. And with the help of this information, we should be able to find out the free cash flow equity for these 3 year 2000 X3, 2000 X2. And this two information's are relevant for us.

That is because we need to say find out the net working capital change for that we need to have net working capital also 2000 X1. So, that we can find out the networking capital for 2000 X2. And these 30 rupees figure capex or 2000 X1 is redundant information for we are not going to use it in our calculation. So, let us go to a simple spreadsheet for this to calculate the pre-taxed equity.

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So, this same data is reproduced here. In this case and first of all as we as you discussed in the free cash flow with the far, we let us find out the net working capital for all the three years given that is nothing but current assets minus current liabilities. So, it is 110 rupees for 2000 X1 and if you drag it to two years hence. So, you got 150 and 140. So, I have delta NWC or change in networking capital is 140 - 100 ten. Similarly, we require another 10 rupees of net working capital in 2000 X3.

Again, I am emphasizing that to run the operation in year 2 we need one 40 rupees in net working capital. We already have working capital carried forward from the previous year 2000 X1 on to 10. So, in this year we need for expansion only 30 rupees about networking capital not 140 rupees working cap. So, the delta has to be considered as far as investment in working capital is concerned. So, delta net working capital is 30 for 2000 X2 and is 10 for 2000 X1.

So, now let us do the next thing that we find out the free cash flow for equity. So, in that case first we take the profit after tax. That is already calculated is given here net profit or profit after tax, some somewhere it is also mentioned net income. So, net profit after tax net income are actually synonyms. Then we add take the depreciation to be added. So, depreciation is given 70 here. Then we subtotal, so, 400 plus 70 that you get **(()) (21:19)** figure.

Capex is given as 40 then change in working capital is given as here we have already calculated here previously 10. Then add or less date, so, new date is 120 rupees rate issued. And 45 repairs on date new net debt is how much we have 120 - 45. So, similarly we can calculate these two this all this calculation to the next year the previous year I only got this figure. So, this is this figure then we have to find out the free cash to the equity.

So, we start from the soft total 470. We remove capex of 40 in 2000 X3 I am explaining. We also remove the working capital requirement, and we add net debt that the company has got. So, 495 rupees is the free cash flow for equity holders for 2000 X3. And the same thing you calculate that comes to 310 is the free cash flow for equal to equity for the 2000 X2. And so, with the help of cash flow to the equity we can find out the value of the equity.

With the help of **(()) (22:40)** cash flow to the firm like this here we can go and find out the free valuation of the firm itself. So, the FCFF uses for valuation of firm or valuation enterprise or a relation company or FPE is used for valuation of equity. So, let us go back to another some simple exercises we did this calculation in the spreadsheet.

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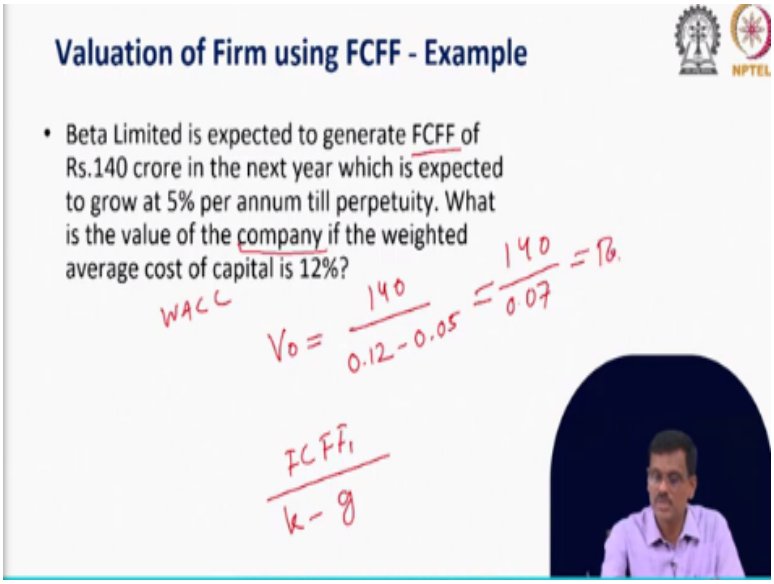

Now we have got a simple company simple cash flow for that matter which is called beta limited, which is expected to generate free cash flow for the form of 140 crore. In the next year which is going to grow at 5 percent per annum till perpetuity. It is what the value of the company if the weighted average cost of capital is 12 percent. Because we have to find out the value of the company with the help of free cash flow firms, we need the weighted average cost of capital that is work we need that.

It is not simple it is a perpetuity which is going to perpetuity with growth very simple formula to apply. So, the value of the firm will be V 0 today, that is free cash flow next year divided by cost of capital minus growth, that is 0.12 minus 0.05. So, this comes to that means if you got to give the formula. So, FCFF 1 divided by k which is cost of capital or whatever is cost of capital is minus g. So, that gives us 140 divided by 0.07. So, that gives us rupees 2000 crore is the value of the company using free cash flow for the firm.

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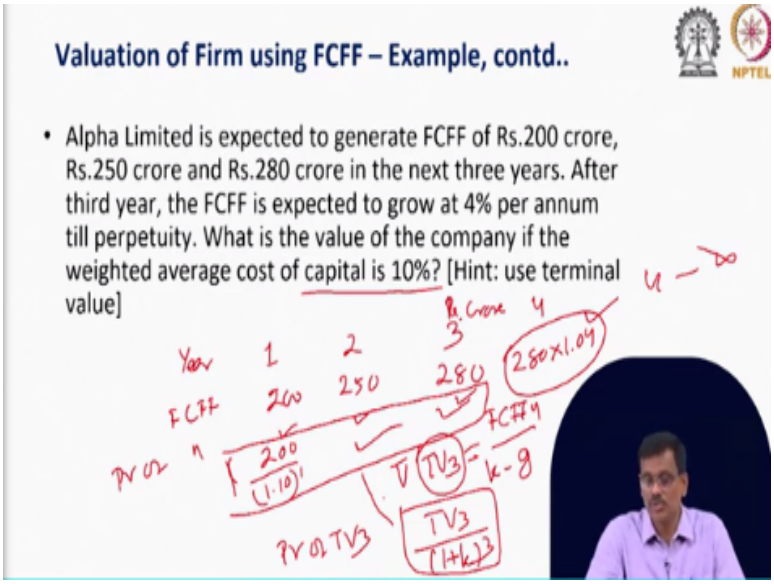

And similarly, we have another simple exercise where we have multi stage free cash flow multi-stage model. So, let us say we have estimated the free cash flow for one company for next three years. And after three year it will grow at 4 percent per till perpetuity. It is what is the cost of; what the value of the company using free cash flow and the weighted average cost of capital for these companies only 10 percent.

So, in this case what happens we have here, that is 1, 2 and 3. So, I have been given the cash flow FCFF, that is 200 crore. So, in these are all rupees crore for our calculation 250, 280. And year four it will be growing at 4 percent. So, it will be 280 into 1.04. So, what we need here? So, what will do here? We will find out the present value of free cash flow for year 1, year 2, year 3 for example, for year 1 it will be 200 by 1.10 to the power 1.

Similarly, you can do for 250 and 280 by discounting twice and thrice because it is second year and third year. But then what happens our cash flow is going to grow at 4 percent till perpetuity. So, then we have to find out the value of free cash flow from 4 till infinite. So, for 4 till infinite we will using the perpetuity model for pitch it with growth. So, that will give us the value at the a beginning of fourth year that is also called value at the end of third year.

So, what will happen that is called we discussed in the dividend discount model, will be using the concept of terminal value. So, we will find the terminal value at the end of third year. So,

terminal value at the end of third you will be free cash flow for the firm in the fourth year divided by cost minus growth. So, if you have this particular figure given and you divide by k - g that gives you the terminal value at the end of third year.

Then we have to also find out the present value of terminal value three. How we find it out? Very simple so, discount the terminal value 3 because it is going to take place at the end of third year, you discount it three times 1 + k to the power 3. So, we have this one component, we also have this discounted cash flow 1, 2, 3 we have we will calculate that another component. So, this one plus this one will give us the value of the for using free cash flow.

So, what you will do? We will use again this simple spreadsheet to calculate. This value we can always calculate also, but let us go to the spreadsheet here.

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So, this is the data. So, we have 200 to 250 and 280 these are the free cash flow. Then you have 10 percent the cost of capital and 4 percent the growth. So, cost of capital and growth in FCFF from fourth year onward. These are the thing given. So, first of all we find out the present value free cash flow for 1, 2, 3 year. So, what you do here is equal to 200 divided by 1 plus the cost of capital. That is 10 percent, 1 + 10 percent to the power the number of years, that is 1 so, to the power 1.

And let us free this cost of capital. So, that we can drag the formula we do not have to repeat it. So, we can drag it because we are going to use the same cost of capital for three years. So, let us drag it to this. So, we got the present value of cash flow for this particular company 2006 that is your 1 year 2 year 3 these are thing. Then what you do we have to find the terminal value at the end of third year.

So, for terminal value to find out we should also have the cash flow available for fourth year. So, for a cash flow for fourth year is nothing but third year cash flow into one plus growth. So, one plus growth that gives nothing but growth is 4 percent and my terminal value of **(()) (29:18)** will be cash flow of 4 divided by k - g, k is cost of capital 10 percent minus growth that is 4 percent. So, terminal value at the end of third year is 4853.33.

Now what do we do? We find out also present value of terminal value nothing but this one you discount three times because the terminal value is at the end of third year. So, one plus cost of capital 10 percent and to the power third 3 years. So, 3 that is the present value of terminal value 3. Them you also sum the present value of first 1, 2, 3 years. So, we sum it up and that gives us 598.80. Then you sum it up the terminal value present value plus present value of free cash flow from 1, 2, 3 year.

So, that gives us 4245.18. That is the value of the firm using this model. In this model we have used multi stage growth. So, these are certain growth the cash flow is given then you have for growth till perpetuity constant growth from fourth year onward. So, this is something we did the example using free cash flow we can find the value of the firm the multi stage model.

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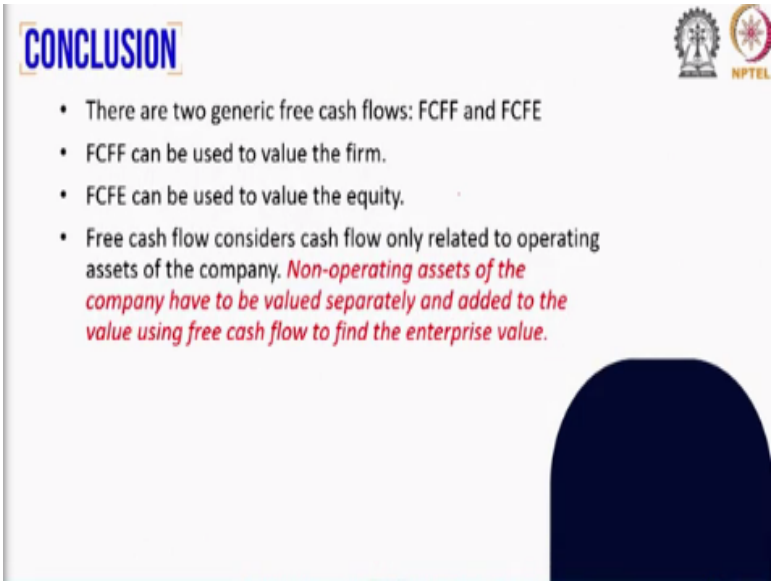

So, in general conclusion we have discussed about two generic free cash flow. That is free cash flow the fund free cash for the equity, you one can use the free cash flow for the firm to find out the value of the firm or the enterprise of the company. Together similar one can use the free cash from the equity to value the equity of the company. But one important thing is that when talk about the free cash flow, we look at the cash flow from the core operations of the business.

Now what will happen when you are acquiring a company, company has certain core operating assets which leads to revenue expenses etcetera which leads to the cash flow for the company. But a company may have some non-operating assets. For example, the company may have the investment in some other subsidiary, investment in some other company or some deposits or some bonds, debenture or something like that. So, those things have to be valued separately.

Because when you did the free cash flow calculation in this formula when you did, we talked about only operating profit after tax, we did not take into consideration any other income that the company might be earning on some other investment we did not consider. So, what value we got it is of the operating part of the company. If the company has some other assets which also contributes to the cash flow on income of the company. So, those assets have to be valued separately.

Then we can find out the value of the company. So, valuation using the free cash flow is not the conclusive valuation of company if the company does not have any other non-operating asset non-core asset it was only has core asset which leads to the revenue and expenses for the company. Then valuation using quick cash is sufficient. But the company has any asset which is non-core in nature.

And the income or cash flows generated by those non-core assets are not factored in the free cash flow that you calculated. Then those assets have to be valued separately. So, we will discuss about these concepts in the subsequent session.

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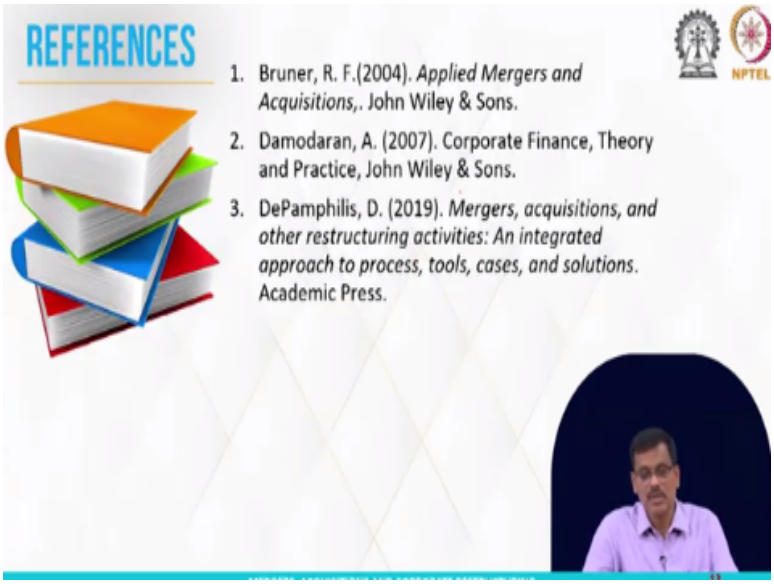

We I hope you had a good learning and happy learning in future. Thank you.