Mergers, Acquisitions and Corporate Restructuring
Prof. Chandra Sekhar Mishra
Vindo Gupta School of Management
Indian Institute of Technology, Kharagpur

Lecture - 14
Valuation in M and A: Cash Flow Based Approach – 4 (Dividend Discount Model)

Hello friends, welcome to another session on mergers, acquisition corporate restructuring. In this particular session as a continuous in the previous class we will be talking about valuation of company or valuation of equity for that matter. In the previous session we talked about an important aspect in the valuation that is called the discounting estimation of discounting factor otherwise known as estimation of weighted average cost of capital work for that matter.

In this session we will be talking about valuation using dividend discount models. So, we will be talking at the valuation of equity because dividend is given to the equity shareholders and how to find out the value of an equity share of a company using dividend discount model.

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So, the concept that we have discussed dividend discount model and dividend can be growing on multiple stages. So, we can a multi stage dividend grow different growth, we can have a constant stage dividend growth also, we will also have small simple exercises on dividend discount model, we will also discuss about another important aspect of cash flow valuation that is called s concept of free cash flow.

Subsequently we will be using this particular free cash flow of a valuing company and valuing shares in the subsequent sessions.

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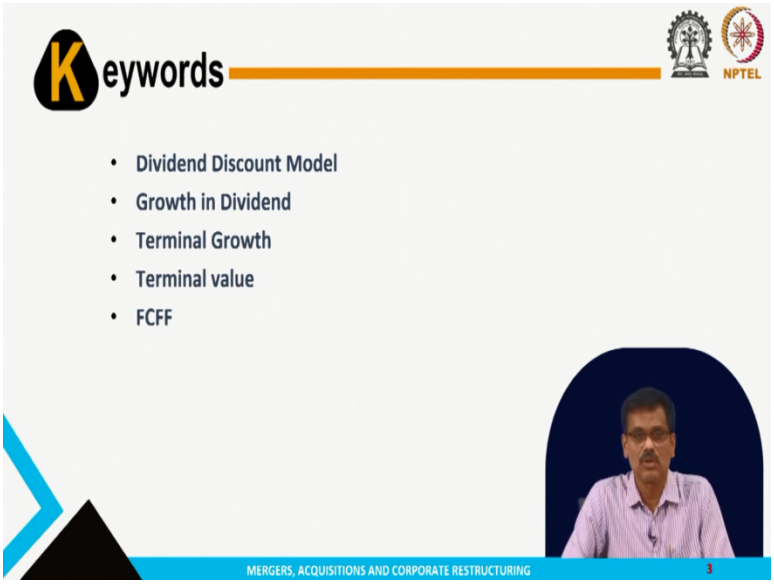

So, the keyword that you have dividend discount model we will talk about growth in dividend, we will talk about terminal growth, terminal value and FCFF or otherwise known as free cash flow for the firm.

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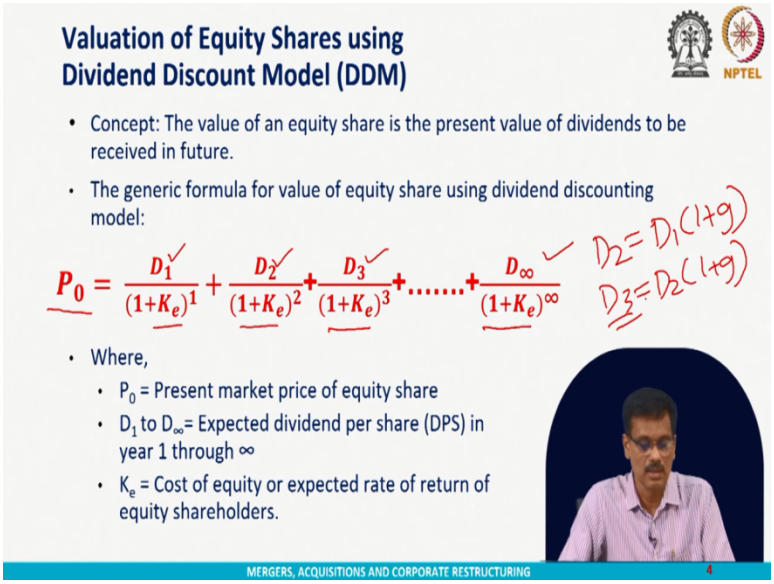

When if generic model for the dividend discounting, is we have value of an equity share which is the present value of dividend to be received in the future. So, the generic formula is that yes, we have a P 0 that is two days we are estimating two days zero time so we have to estimate the dividend for year 1, year 2, year 3 up to infinite because equity investment supposed to be a perpetual investment.

So, that means as investor I am going to hold this share for all the time to come that is the assumption access. So, then what we do here we discount the future dividends with the discounting factor that is called cost of equity that is we are taking K e here. And so each dividend is discounted at the cost of capital and if it is third year dividend discount three times so up to infinite discount also infinite times for the last dividend for that matter.

So, that way we find out this generic valuation in fact this model is applicable for any cash flow based approach, so we are going to talk about the price is a function of future cash flow. In here we are talking about future cash flow in terms of dividend per share on the equity share. So, this is the generic formula but when we see the actual case, so we will see that dividend will be actually growing at a particular rate.

So, in that case what will happen so if I have to say estimate D 2 if I know the growth in dividend so then with the help of D 1 and into 1 + g that can give me the dividend for the next year. Similarly, D 3 will be assuming same dividend is grow their growth is there then we have D 2 into 1 + g that gives you D 3, so like that one can estimate the dividend for that matter for all the years to come which is of course difficult to find the growth but we have to find the growth because if you are going to use this particular model assets.

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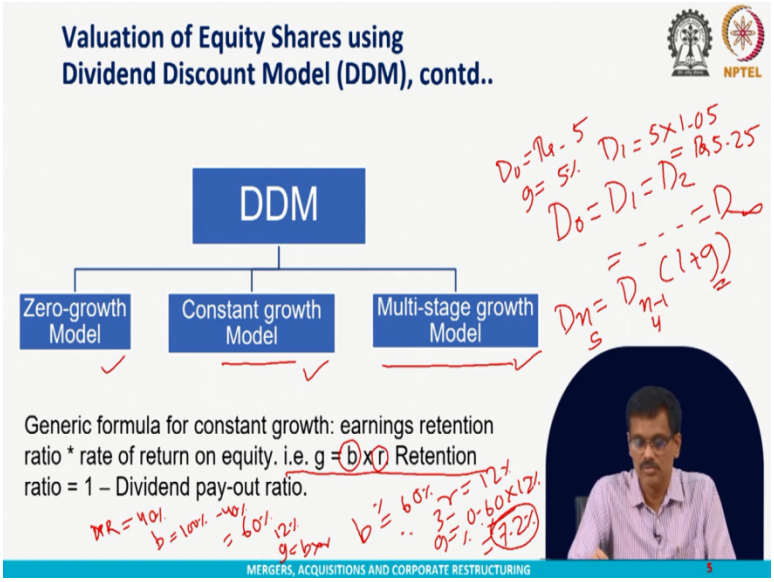

So, now so keeping the growth in mind so we have multiple types of different discount model, one model is says that there is zero growth that means there is no dividend growth that means if I have to go today's dividend is D 0 current dividend equal to D 1 equal to D 2 like this equal to D infinite that means there is no growth in dividend. So, dividend is going to remain constant so zero growth model or constant dividend model.

Then we have another thing is constant growth so they say that is the dividend we know that is dividend is growing to grow at a particular rate may be 5 percent, 6 percent, 8 percent for all the time to come. So, in that case what will happen D n will be D n - 1 into 1 + g, so if your D is if I know the growth of as a dividend of fifth year, so it is fifth year so then I if I know the growth of dividend, so dividend of fourth year then I have the growth here then I can find out.

So, that way generic we can find out. So, with that means dividend is going to grow at a particular rate. So, for example if the dividend of this here is rupees 5 and this grow going to go at 5 percent, so the D 1 is going to be 5 into 1.05 that is rupees 5.25 so 5 rupees 25 paisa. So, this is the thing as well then, another thing is which is actual real life scenario situation multi stage growth. So, companies dividend will grow at a particular rate may be the high rate depending on the situation of the company.

In is when companies start making profit and they have got very high profit super normal growth for that matter. So, company will have the ability to give use dividend and the revenue also can grow at a very high rate. So, and then what happens after the company special stabilizes companies growth and dividend will remain will become will also stabilize. So, you have high growth for certain period of time then followed by a normal growth subsequently.

So, that is called multi stage growth. So, he may be like dividend for this particular one particular company may grow at let us say 12 percent for year 1 and 2, then it may grow out let us say 9 percent for year 3 and 4. And then after fourth year the dividend may grow out let us say 5 percent for all the time to come. So, how are you going to what will be the model so generic model we have all defined we will be applying that only.

But you have certain shortcut which also can be used to find out the value of share in the multi stage. So, why multi stage? Because first growth is 12 percent, second stage growth is 9 percent and third stage which is a perpetual growth constant growth is less 5 percent here. So, we will take up certain small exercises for all these three aspects like zero growth model, constant growth model and the multi stage growth model.

And when you come to the growth generic formula for growth in dividend is that is called b into r and b is nothing but the earnings retention ratio and r is nothing written on equity, a retention is nothing but the 1 minus dividend pay-out ratio or a 100 percent minus dividend pay-out ratio. So, as an example if dividend pay-out ratio of a particular company DPR is let us say 40 percent in that case retention ratio that is b as per our formula is nothing but 1 minus 40 or 100 percent minus 40 percent.

So, that gives us 60 percent and the company's rate of return on equity is let us say12 percent in that case the growth will be b into r, so here b is here the b is 60 percent and r is 12 percent. So, the growth is going to be into r that is called 0.6 that 60 percent into 12 percent that comes to 7.2 percent is the growth. This is generic formula which is discussed in corporate finance refinance and management in the dividend discount or dividend theory.

So, growth is nothing but retention ratio into return on equity so in this case we example 7.2 percent growth in the dividend.

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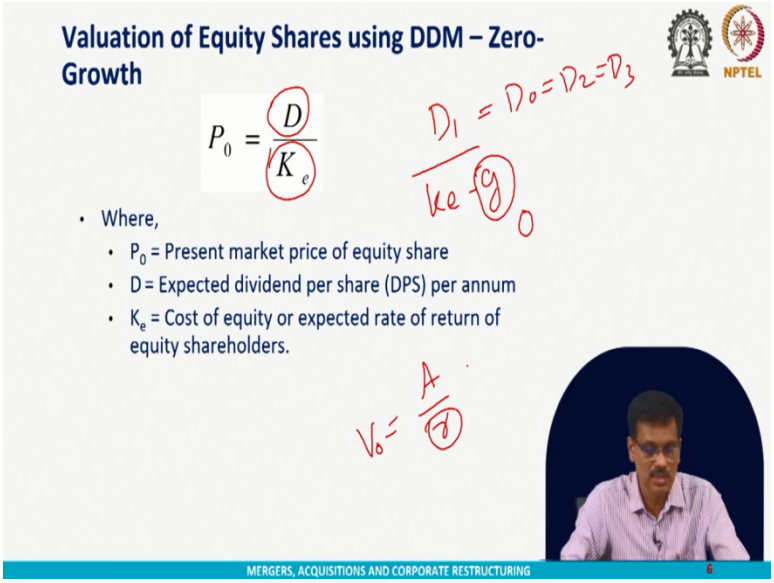

So, coming to the an exercise here we are talking about the valuation equities as including using zero growth there is no growth assessed. So, in that case we are taking dividend which is going to be remaining constant for all the time to come divided by the cost of equity because even if you go by the zero the generic model where D 1 by K e - g with a constant growth model. So, since g 0 no growth and D 1 = D 0 is equal to all the D 2 D 3 all those things.

So, we can take D divided by K e as simple. So, that means the price is today is nothing but this is actually perpetuity it is a perpetual cash flow constant cash flow we are going to get for all the time to come. So, in time value of money we have seen that whenever the perpetuity the value is equal to A by r, A is the annual cash flow or periodic cash flow that you are going to get for every year to come and there is no growth, r is the rate of return expected by the investor. So, value 0 is nothing but A by r. So, same formula is used here and we got the **(()) (09:43**).

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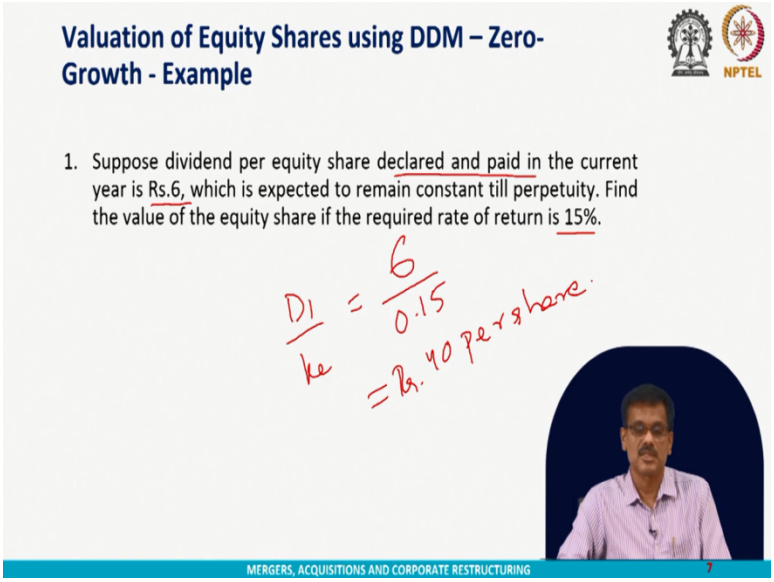

So, if you took an example here suppose one company the dividend per share is declared and paid is let us say rupees 6 and they are expecting return on 15 percent the investors. What is the growth? What is the value? So, there is no growth so we will apply the D 1 by K e formula so in this case D 1 is 6 and K e 0.15 or 15 percent so that gives a rupees 40 per share that the value of share equity share simple.

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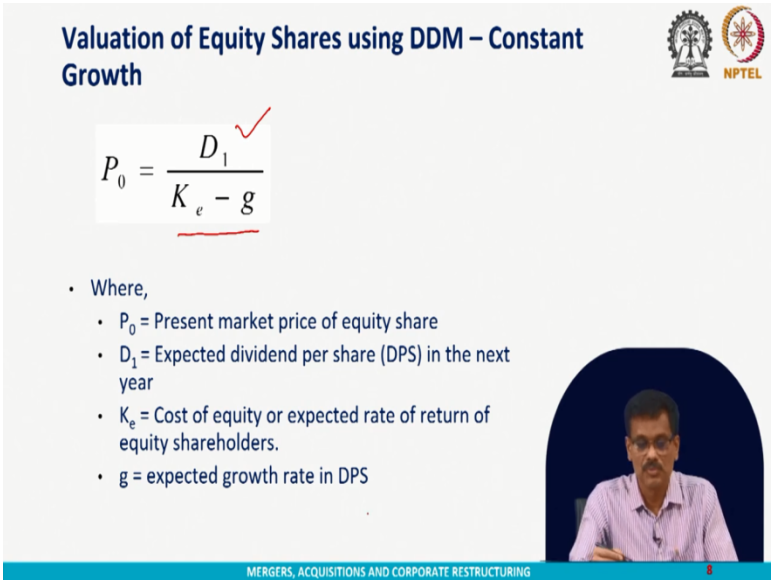

Similarly, we will take another example where you talk about the constant growth so in constant growth, we have the formula D we discussed in the previous slide that D 1 by K e - g. So, and the nomenclature is same like earlier so price P 0 is price D 1 is expected in the next year, cost of

equity is known as K e or return on expected by equity investors and g is the expected growth rate in dividend. So, if you have these three inputs then you can find the value of share today.

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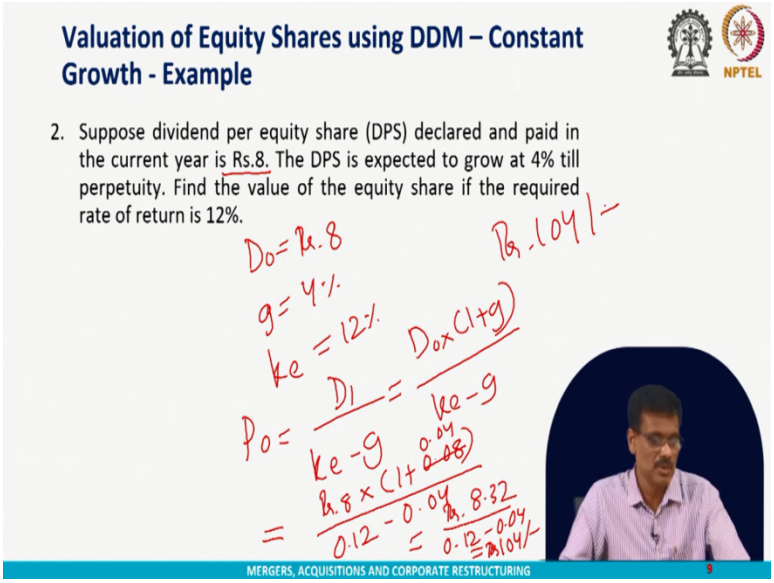

So, now going to another example for this suppose dividend for equity share of a particular company is current year that means D 0 is equal to rupees 8 and the growth is here 4 percent and the cost of equity or written expected by the investor is let us say 12 percent. What the value of the share? So, if you want to find the P 0 so it is nothing but D 1 by K e minus growth and D 1 is nothing but D 0 into 1 plus growth.

So, we have to be careful we have got the value rupees 8 is D 0 not D 1 divided by K e - g. So, in our example so D 0 is rupees 8 into 1 plus growth rate is 1.1 plus 0.08 whole divided by 0.12 minus 0 this is 0.04 the growth rate not 0.08 hold by 0.12 minus 0.04. So, that gives us rupees so D 1 is nothing but rupees 8.32 with 4 percent growth and 0.12 minus 0.04 that gives us rupees 104 and the value of the share.

So, that is what by using the constant growth rate we got the value, so in this case answer is rupees 104. But it is possible in the case of companies where dividend may not grow constantly from the next year on wards dividend may grow at a higher rate. Because of the good profitability and ability of the company to pay more dividend the company made declare high growth in dividend or high amount of dividend for certain number of years and which may

actually stabilize later. So, that is called multi stage. So, how are you going to tackle that particular problem?

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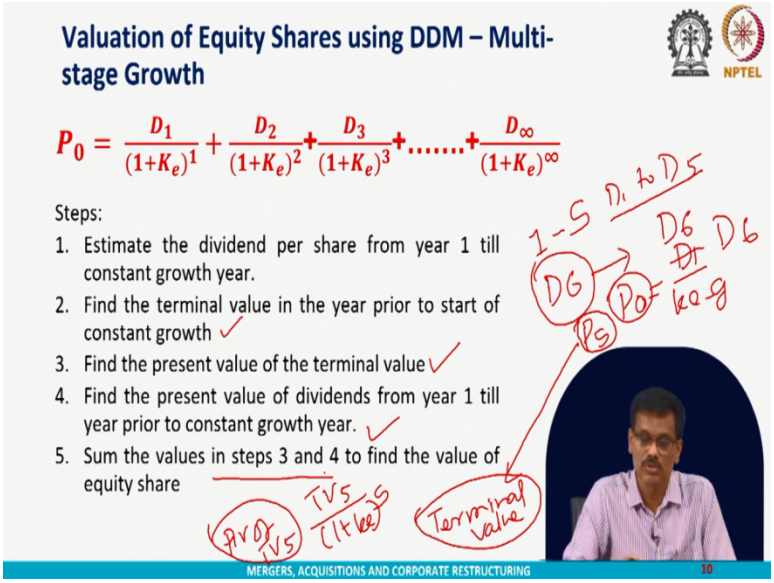

So, the generic formula is that you discussed in the previous slide is P 0 is a function of dividend to be expected in the future is to come. So, there is no change in that, but thing is that we have to now estimate the dividends for different years separately. So, what you have here? We have to estimate dividend per share from year till the constant growth here. That means suppose we are going to have a very high growth period from 1 till 5.

So, you have to find out the individual dividends dividend per share of your 1 2 3 4 and 5, then we had also find out the dividend for the period from where the constant growth starts that means we will also find out D 6 so here you get D 1 to D 5. Now once you get the dividend D 6 in this example which will grow at a constant rate so from D 6 onward it becomes a constant growth model.

So, if I have got the value of dividend D 6 which is growing to grow at let us say certain constant percentage. Then I can apply the constant growth model to find the value at the beginning of the sixth year in this case. So, as we discussed in the previous formula P 0 = D 1 by K e - g. So, if I have got D 6 here which will grow at certain rate constant rate then if I replace this D 1 as a D 6 then this value will be for me every P 5 just 1 - 1 so 6 - 1, 5.

So, with the help of dividend 6 which will grow at a constant rate I can estimate the value of this share at the beginning of year 6 or at the end of year 5. So, I have got the P 5 and this P 5 is also known as terminal value at the end of year 5. And once you have terminal value which is at the end year 5 then you discount this terminal value to today because you are going to find the value today.

So, find out the terminal value and then find out the present value of terminal value by discount, so if it is terminal value is 5 then the present value of terminal value will be TV 5 divided by 1 plus K e to the power 5. So, that is the present value terminal value. Then you also have dividends from 1 to 5 dividend 1 to 5 so find the present value that dividend also separately once you have that value here.

So, you have one value here another value here so add them to find out the value of the equity shares. That means we are talking about we are going to find out the present value of dividend for the high growth period separately and also going to find out the present value of terminal value separately then you add them together to find out the value of share today. So, with an example we will be able to explain little better.

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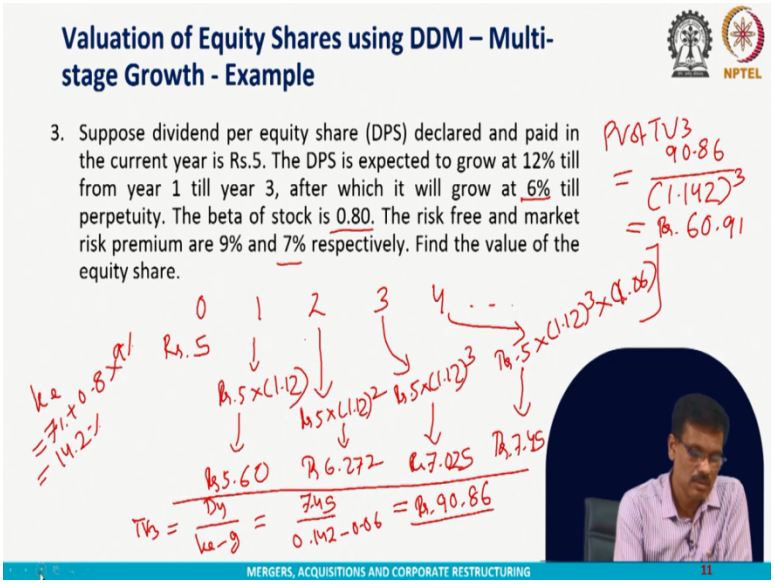

So, for example in this case suppose a particular company has declared and paid a current year dividend is D 5 so that means if I draw a timeline here 0 1 2 3 4 like this. So, the current year dividend is rupees 5 and this dividend will grow at 12 percent till from this year till 3 that means so 12 percent means the year 1 dividend will be rupees 5 into 1.12 and here 2 will be again it will be rupees 8 into 1.12 to the power 2 and here three will be rupees 5 into 1.12 to the power 3.

Because through three years will grow at 12 percent and fourth year dependent will be how much up after third year it will provide 6 percent. So, fourth dividend will be now in this case how much rupees 5 that means third year divided into 6 percent gross rupees 5 into 1.12 to the power 3 that is the third-year dividend into another growth of 1 another 6 particular 1.06. So, in this case we have to estimate the dividend for several years.

So, if what I will do now, we put the values here so this becomes rupees 5.60. And this if you calculate the value is nothing but rupees 6.272 and this value is nothing but rupees 7.025 and this value is nothing but rupees 7.45. So, once you have this now what you will do now here, we have to find out the first will find out the terminal value. So, terminal value because this is fourth year onwards dividend you are going to get which will grow at a constant rate.

So, I will have the terminal value 3 because I have got a dividend for the fourth year onwards. So, terminal value three will be nothing but D 4 divided by K e - g. So, what is my K in this case? My cost of equity, my cost of equity is estimated is how much so we have got this is we are going to use the CAPM because that is the information given so it has got a 0.80 beta. So, cost of equity nothing but risk-free rate of return is with nothing but 7 percent plus beta into risk premium.

Risk premium is directly given years so 9 percent we do not have to reduce the risk free data return for market rate of return only reduced. And that has been given so 7 percent plus 0.8 into 9 percent gives me 14.2 percent is my cost of equity. So, my terminal value 3 will be in that case dividend 4 which is 7.45 divided by 0.142 that is your cost of equity minus growth the constant growth which is nothing but 6 percent - 0.06.

So, that gives me the terminal value three as rupees 90.86, so we got the value of terminal value. So, next step what will be the thing it will be we have to find out the present value of terminal value 3 that is nothing but 90.86 that is PV 3 divided by 3 even you are discounted 3 times because it is at the end of third year. So, discount the three times at the cost of equity we have already find out the cost of equity as 14.2 percent so, 1.142 that is called 1 + K e to the power 3.

So, that gives me an answer of rupees 60.91 around approximately. So, we got one if you look at the previous one so we got the third value third step in this previous in the steps and we have to now find out the four step. So, third step we got so four step in a thing but the present value of dividend from year 1 to 3. So, in that case we have to find out this 5.60 so present value of dividend for, so let me remove this thing from here we do not need it now.

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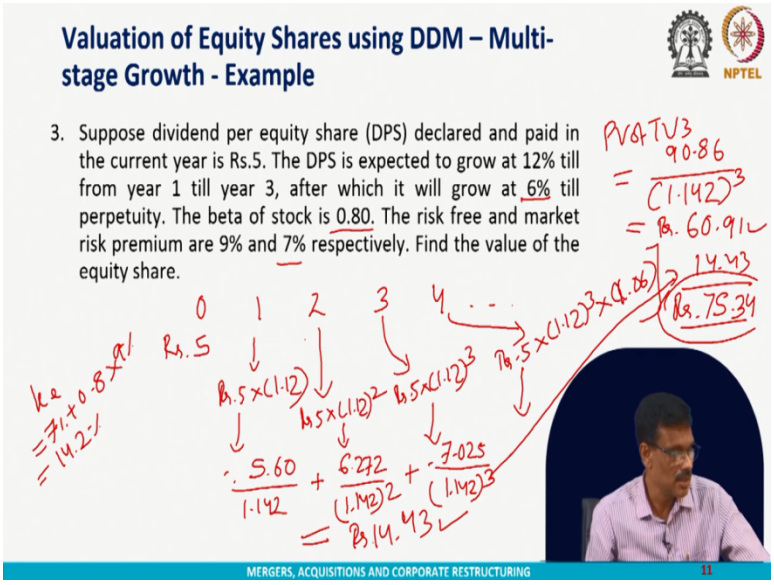

So, our present rate dividend will be our first dividend rate was 5.60 divided by 1.142 that is 1 + K e plus this second dividend was 6.272 divided by 1 + 14 to the power 2 plus third dividend was 7.025, the D 3 that is 1.142 to the power 3. So, that gives us the total value the summation of these three value is nothing but rupees 14 around 14.43 so, we will discount and now what is value. So, what you do here? This is step four this is step three.

So, we will take this value here and add to this, so 14.43. So, that gives us value of this here as 75.34 or around 40 something else so that is the value that you are going to get value. So, what

we did here? We found the terminal value we discounted terminal value to today we also found out the dividend for three years separately and do that and these things also we can explain better also in the with the help of spreadsheet.

So, let us same data have been given for both the question number the previous one the constant growth model as well as for this multi stress growth model in a spreadsheet. So, let us see how it can be found out.

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So, looking at the constant growth model so is nothing but your D 1 by K e minus g so your D 1 is how much the dividend that is D 1 dividend equal to dividend 0 that is 8. into 1 plus growth that is growth is nothing but 4 percent. So, that gives us D 1 as 8.32 in rupees and what is the value today that is price 0 P 0 is nothing but equal to the D 1 divided by cost of equity that is 12 percent - 4 percent.

So, that gives us the value was 104 that way it is also we did enough **(()) (23:36)** also we got the same value, so 8.32 that gives us 10, so that is the constant growth model. Similarly, our earlier exercise that we talked about the multi-stage growth, so in this case you have 5 dividend powers here today that is 5 expected growth rate dividend is 0 to 1 2 3 12 percent, after which it will grow at 6 percent, beta of the stock is 0.8 and then 7 percent is the return respiratory return and 9 percent is our this premium.

So, using these two so we got the cost of equity as nothing but we can recalculate the users also. So, cost of equity nothing but risk period of return plus beta into risk premium so risk premium is 9 percent. So, that gives us 14.2 percent is the cost of equity or discounting factor that is used to discount the future dividend. Then what you do you have to estimate the dividends already we have zero year dividend although zero year dividend is not per the valuation we have no present value.

But here is your dividend is required to estimate the dividend for subsequent years. So, we have from one to three you have 12 percent growth. So, 5 into one class the growth rate that is your 12 percent growth and that is so that gives us the dividend growth dividend for this first year so that

gives 5.6 and we have to also estimate dividend like this for second and third year and fourth year dividend nothing but 7.02 into 6 percent growth that is 1 plus growth 1 plus 6 percent.

So, keeping in that bracket, so that gives us 7.45 and then what we do we find the present value of dividend so we will be doing for your 1 2 3 so that is equal to 5.60 divided by cost of capital that is 1 plus cost of capital so 1.14 so that gives us this one and we can also use the power here. And so that you can drag the formula to the power is nothing but the one discount. Similarly, we do that for dividend we will estimate dividend for three years and got the dividend.

And so that is your present value of dividends for your 1 2 3, then we have terminal value at the end of the three nothing but terminal value nothing but dividend in the fourth year divided by cost of equity minus constant growth rate. So, that gives the terminal value 90.81 as per this and the present value of terminal value nothing but you discount this terminal value three times. So, 1 plus the discounting factor is 14.20 that we have to the power 3.

So, that gives us a 60.97 as per excel in the PPT we had an approximate value here you have exactly here 60.97 here and this is your present value of terminal value and my present value of dividend nothing but sum of these three values that is your dividend 1 to dividend 3 if the present value. So, sum of these two these three so that gives you and finally the value of this area nothing but this terminal value present value plus present value dividend from 1 to 3.

So, 75.40 is the value of the share in this particular model. So, while we are talking about multi stress growth model.

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So, coming back to the presentation so we got also in also you got 75.34 approximately but in using expressive you got 75.4, this is always advisable that one uses the spreadsheet for valuation of share so that you get the exact correct value.

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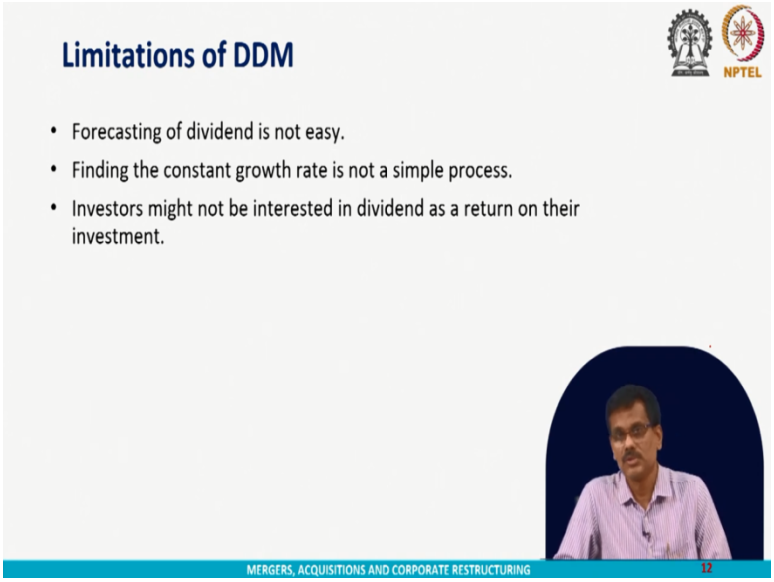

So, but there are certain limitations in the limit discount model first of all forecast interview is not going to that easy. Second is that when is the perpetual growth is going to come what growth will be high growth which will be moderate growth which will be the constant growth that is also not that easy job that part has to be done, this is an important task. And also, there may be very few investors who may looking at who may look at the equities for the dividend purpose maybe for senior citizens.

Otherwise, people look at these shares for something else some growth in the market price which may not be reflecting the dividend assets. So, people may not go for buying a share looking at for the dividend in the dividend discount model has very limited application. So, that is one limitation access. Then we will also introduce in this particular class the concept of free cash flow.

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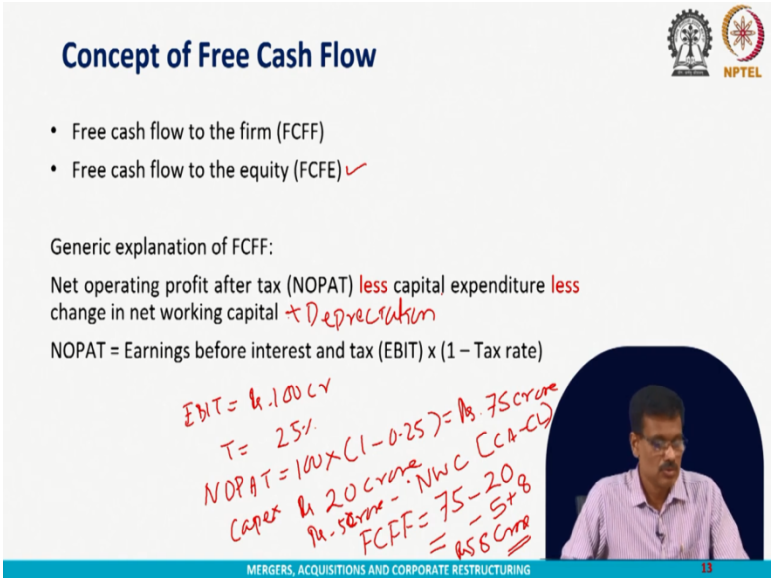

Free cash flow is nothing but the cash flow which is available for the company after taking care of all the requirements that is generic formulas. We have two types of free cash flow for the company, one the free cast for the firm tipping all the stakeholders point of view that is both lenders as well as the equity holders or owners. Another is that you have a free cast of equity where you tick keep the free cash flow of the equity on the equity folders point of view.

That means free cash flow means what, whatever cash flow is out there with the company that is now the company is free to do whatever they feel like. So, in this particular slide we will talk about only the free cash flow for the firm the simple definition here. So, when you talk about free cash for the firm, we look at the operating profit after tax net operating cooperative tax. Then from there once the company is generated operating cash flow, what they will do?

They will be using some money for growth in terms of capital expenditure. They may go for new assets creation no more assets or acquire some assets for that matter also they have to invest something for day to day working capital, so that is called networking capital. So, the change in networking capital will give us another expansion for the current assets and current liabilities etcetera and also capex.

And so then you get that free cash please now they are available that fake cash flow can be used to repay the principle for the loan, pay the interest, pay dividend whatever the company and that

is the free cash flow available for the investors together both lender as well as creators for lenders as well as equity holders. And what is NOPAT? Nothing but the profit before interest and tax into 1 – T.

So, take a simple example if earnings before interest and tax for a particular company is rupees 100 crore and the tax rate is let us say 25 percent so for my NPOAT is nothing but 100 into 1 - 0.25 that gives me rupees 75 crore is my NOPAT. And the company is expected to spend on capital expenditure creation of more assets long term assets let us say rupees 20 crore and the company needs another rupees let us say 5 crore that is your capex is 20 crore and another 5 crore rupees 5 crore as say additional networking capital.

Networking capital nothing capital current assets minus current liabilities in that case the three cash flow for the firm in this example will be 75 crore NOPAT minus the capex minus networking up to 5 plus the depreciation. Because depreciation has been detected before finding NPOAT. So, suppose depletion for this company is let us say 8 crore so my three cash flow is 75 minus 20 minus 5 that means 75 minus 20 rupees 58 crore.

So, this is my free cash flow for the firm who is nothing but net operating probability of tax minus capex minus net change inertial chemical plus depreciation. So, that gives us the free cash flow.

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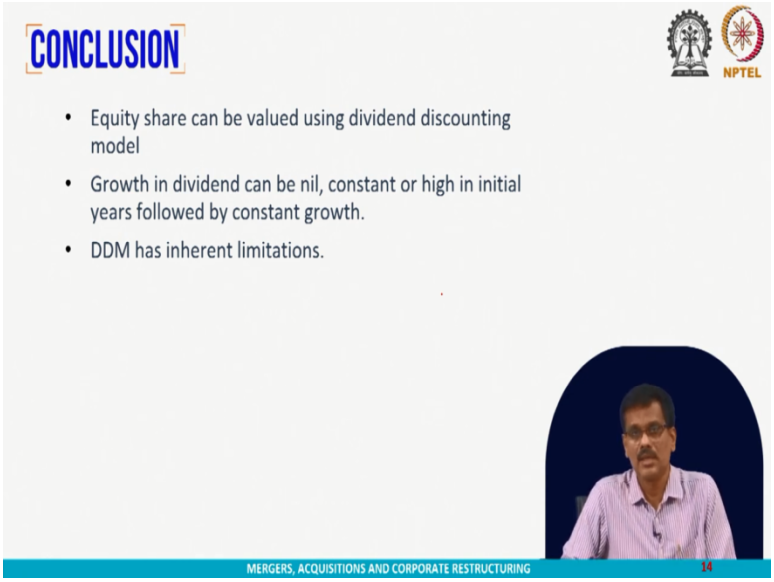

So, with this conclusion so we talked about yes equity share capital can be valued using driven discount model and growth in dividend can be zero growth or constant growth or high growth or nil growth for that zero growth for the matter and dividend discount model also has got certain inherent limitations.

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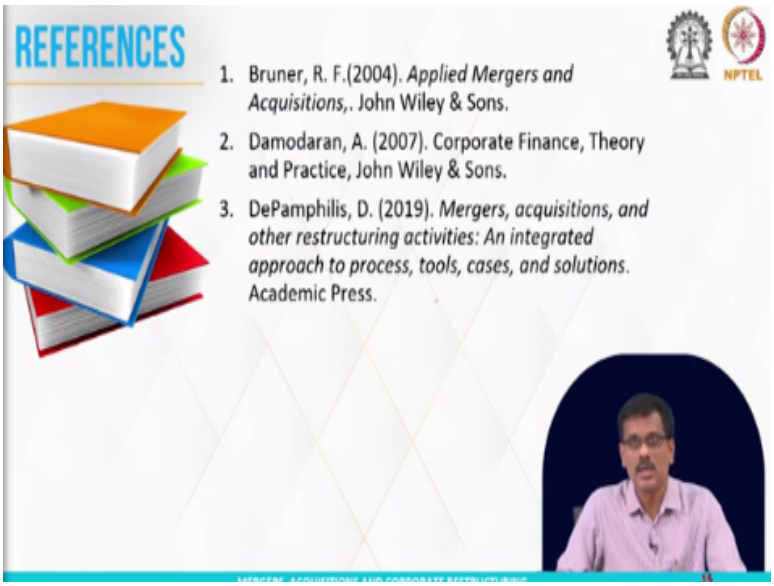

So, thank you and happy learning.