**MINERAL ECONOMICS AND BUSINESS**

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**Week 6**

**Lecture 28 : Cost of Capital - II**

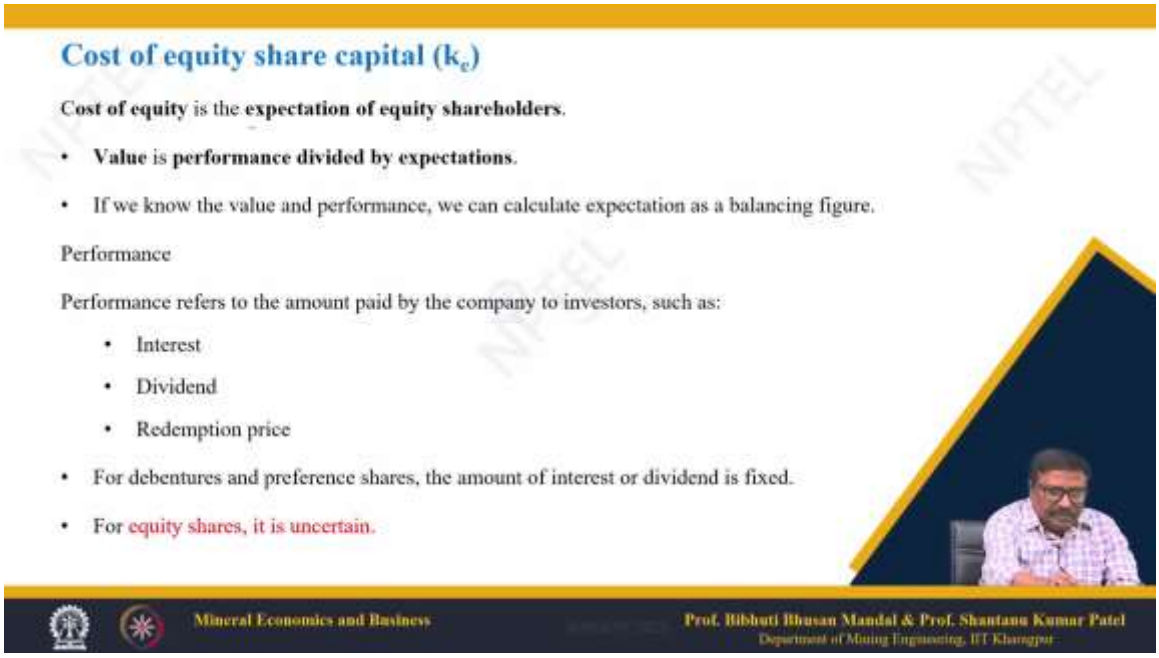
Hello, welcome everybody to this second part of the cost of capital under the lecture series Mineral Economics and Business. In the current lecture, we will be talking about the cost of capital again—a little bit of recapitulation. As we have already covered the dividend and the debt-related cost of capital, here we will be talking about equity shares in particular. And then, the combination of debt and equity, as well as the preference shares, and we will touch on the ideas of the cost of capital related to retained earnings. There will be problems and solutions for each of these topics.


Just try to remember what we said in the previous lecture: when a company raises funds from various sources, it must pay an extra amount in addition to the principal. So, that is what we actually call the cost of capital. The cost of capital, therefore, refers to the return expected by those who provide funds to a business. So, that is their expectation from their

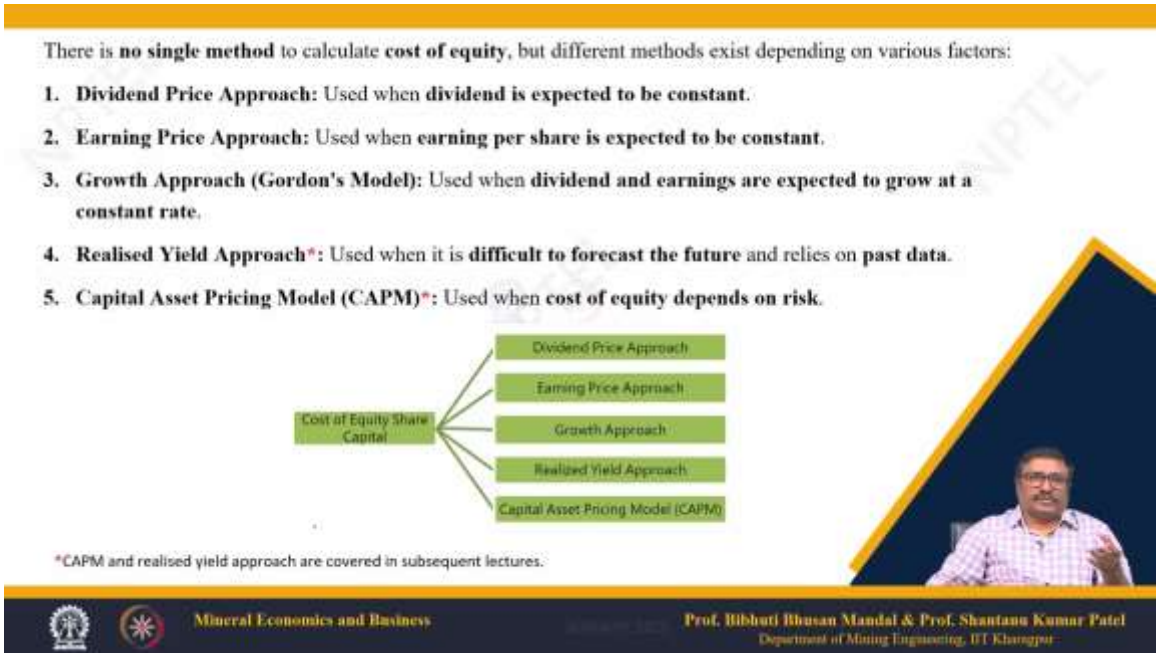
side—like the shareholders, lenders, or the debt holders. That means the people who purchase the debentures from us, from the company.


So, the extra money paid is essentially the cost of using the capital. This is the right language to understand: the cost of using the capital, in short, we call it the cost of capital. That means we are using their capital, provided by them—funds provided by them—and how much we are actually paying back. So, in real terms, how much the expenditure for using this capital is—that is the cost of capital. So, the cost of capital has other uses, like measuring the discount and compounding the cash flows in financial calculations. We need this cost of capital. Here, we will talk about the cost of equity share capital.

And, it is by definition the expectation of the equity head shareholders, because they are the holder of these shares or equities, how much do they expect from the company. There is one more term that is common term is value which is determined by dividing the performance by expectation. How much it is performing a particular instrument like this equity or debt divided by what you actually expected that is known as the value. Now, if the value and performance we can calculate expectations as a balancing figure. So, the performance how to judge the performance of it by the company what the company is paying to the investors.

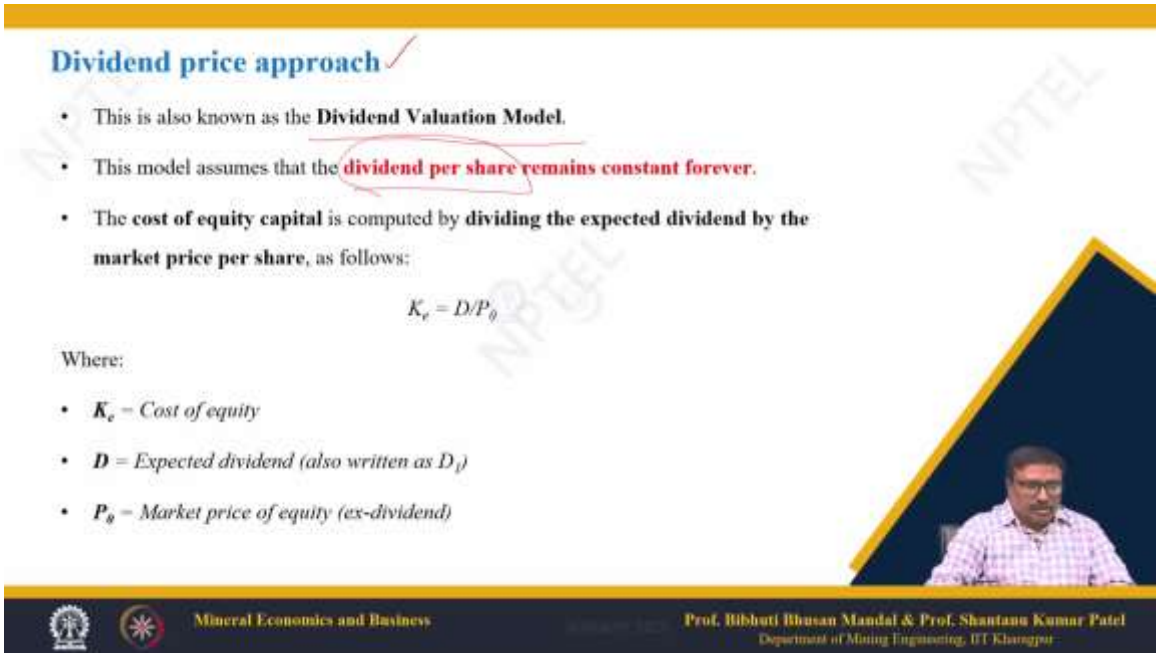



Like the interest that the company pays to the shareholders or like the dividend that we are paying. interest we are paying to the debt holders, dividend we are paying to the say shareholders or redemption price in a preference share and debenture holders, we pay when it is returned back to the company, we pay redemption price. So, for debentures and preference shares the amount of interest is or the dividend is fixed that we know, but for equity shares it is uncertain, it is not certain we do not know how much dividend we get from a company against the shares that we have. Now that is why there are many approaches for calculating the cost of equity or share capital depending on in various factors. Like the dividend price approach is one of them, this is used when the dividend is expected to be constant.




The other one is the earning price approach which is when the earning per share is expected to be constant. But when there is growth that we expect that it will grow, then we have a very well known model called the Gordon's model which is used when dividend and earnings are expected to grow again at a constant rate. Then we have the realized yield approach, this is used when the it is difficult to forecast the future and relies on past data which is a very very realistic situation. The situation is most of the cases it is not possible to understand at what exact rate it will grow, whether it will remain constant or grow at a particular rate. So, the realized real approach yield approach is much more realistic.

And there is one more very well-known and widely used model: the capital asset pricing model, where the cost of equity depends on risk related to various factors. So, these two will be covered—the last two, this one and this one—in the subsequent lectures. We will cover in this lecture the prior 1, 2, 3—ah, number 1, 2, 3—this much will be covered in this lecture. So, let us start with the dividend price approach. Which is also known as the dividend valuation model.



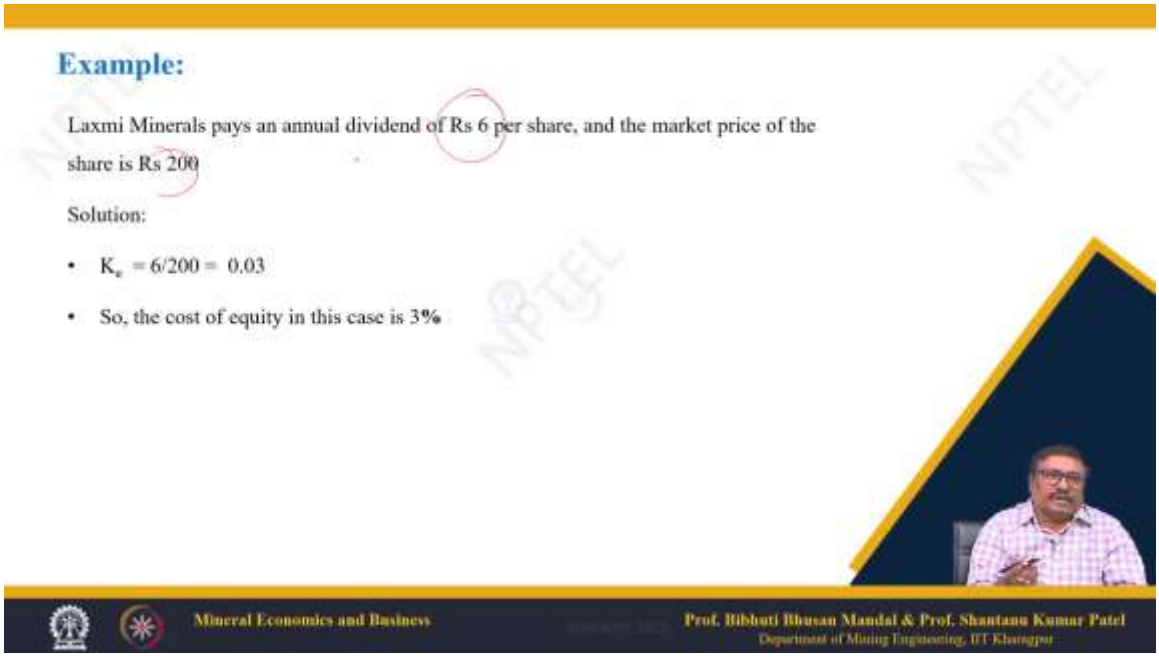

In this particular model, we assume that the dividend per share remains constant forever; it does not change. So, the cost of equity here is computed by:

$$K_e = P_0 / D$$

Where:

- **$K_e$** = Cost of equity
- **D** = Expected dividend (also written as $D_1$)
- **$P_0$** = Market price of equity (ex-dividend)

So, it is simply calculated like that. In terms of percent, when you convert, it becomes the cost of equity—that is all. Laxmi Minerals pays an annual dividend of, say, ₹6 per share, and the market price of the share is ₹200. Now, we get a ₹6 dividend—annual dividend. So, the cost of capital is simply 6 divided by 200, which is 0.03 or 3 percent. It is a simplistic calculation, but it is a starting point from where we can move to much more complicated models.




Now, what is this earnings price approach? This will link the company's earnings to the market price of its shares. So, it assumes that the cost of equity is determined by the expected rate of earnings of the company. So, the investors will expect a certain return from the company, whether through dividends or retained earnings:

$$K_e = E/P$$

where

- E= Current earnings per share
- P= Market price per share

## Earnings price approach

- This approach links a company's earnings to the market price of its shares.
- It assumes that the cost of equity is determined by the expected rate of earnings of the company.
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$$K_e = E/P$$

where

- E= Current earnings per share
- P= Market price per share
- This approach assumes that the earnings per share will remain constant forever.
- The Earning Price Approach is similar to the dividend price approach, only it seeks to nullify the effect of changes in the dividend policy.



So, this approach assumes that the earnings per share will remain constant forever. So, that is why there is no growth model involved in this. So, it is simply in place of dividends; if you are putting the earnings, then it becomes the same model. The only thing is that it depends on whether the focus is on the earnings. So, otherwise, if you just remember the dividend price model that we have just seen earlier, then it is the same model. It only seeks to nullify the effect of changes in the dividend policy, nothing else. Say, for example, if an investor expects from the company, in which he is going to subscribe for shares, should have at least a 20 percent rate of earnings.

If an investor expects that M/S Laxmi Minerals in which he is going to subscribe for shares should have at least a 20% rate of earning, the cost of equity share capital can be construed on this basis.

Suppose the company is expected to earn 30%, the investor will be prepared to pay:

₹ 150 for each share of 100.

Earning = 30%

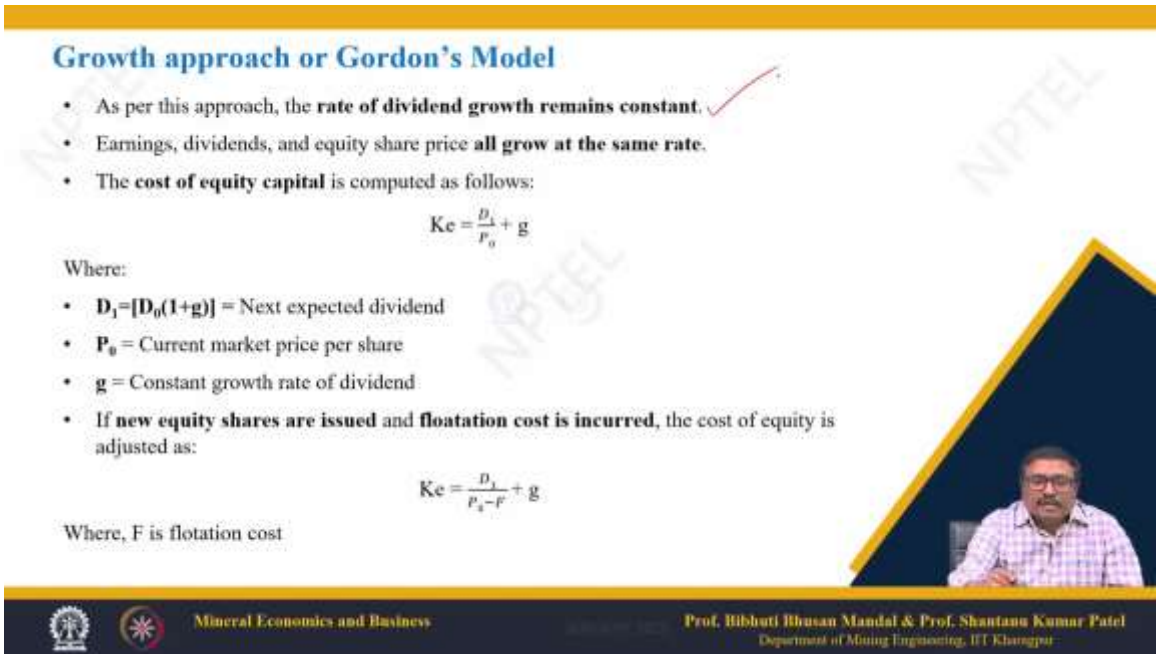
Price = 20%

E/P = 30/20 = 1.5

Investor is willing to pay = 1.5 × 100 = Rs. 150

Rate of earnings, not the dividend, then the cost of equity share capital can be construed on this basis. So, here, suppose the company is expected to earn 30 percent, then the investor will be is 150 for each share of 100, why? Because the earnings are 30 percent expected, and the price at least 20 percent rate of earnings the investor is expecting, then the earnings divided by P is 30 by 20, which is 1.5. 1.5 percent.

So, if 100 rupees is the cost of equity, then you will be ready to pay 1.5 times this to get a 20 percent rate of earning from the 100 from each share. So, that is how it is calculated for when we relate these things to the earning of the company and it is slightly different from what we have calculated earlier. Here we are relating the earning of the company and how the investor is prepared depending on the his expectation and the company's expectation from there. Now, the growth approach here we are expecting that the dividend will grow. So, the rate of dividend growth remains constant in this particular model.




So, earning dividends and equity share price all grow at the same time. So, the cost of equity capital is computed as follows:

$$Ke = \frac{D1}{P0} + g$$

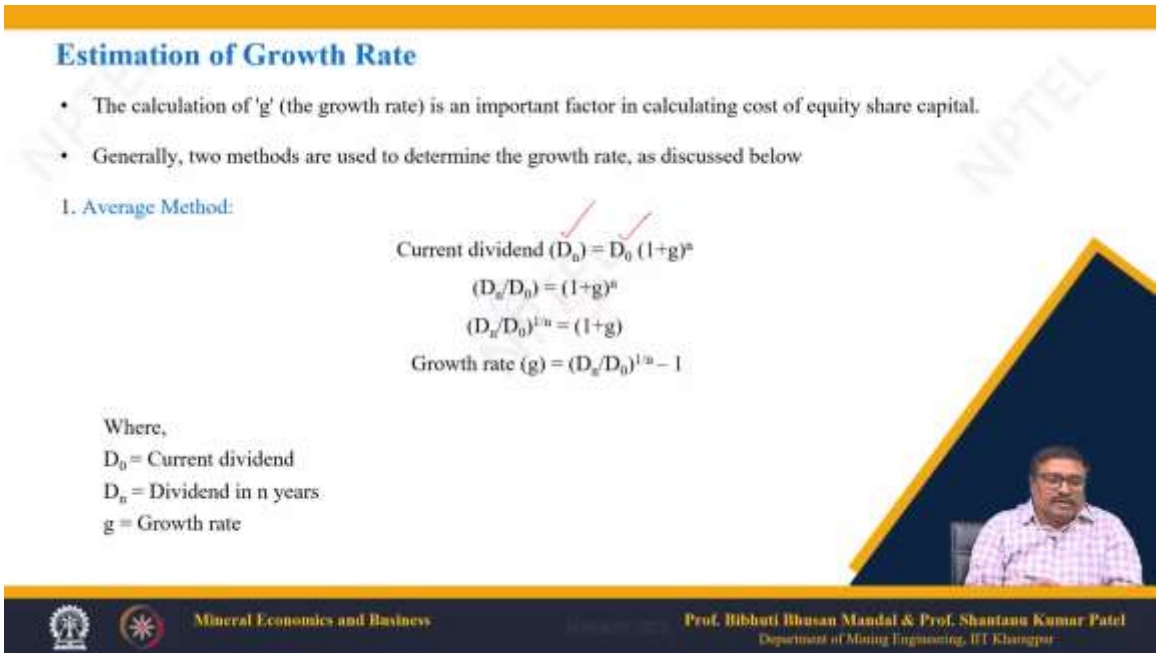
Where:

- $D_1=[D_0(1+g)]$ = Next expected dividend
- $P_0$ = Current market price per share
- g = Constant growth rate of dividend

Now if $P_0$ is the current market price per share and if new equity shares are issued and flotation cost is incurred. In that case we will have to a little bit adjustment which we will be seeing here:

$$Ke = \frac{D1}{P0-F} + g$$

Where, F is flotation cost




Now, the calculation of G dash or the growth rate is definitely an important factor in calculating the cost of equity share capital. So, generally we have two methods to determine the growth rate, as we see now:

Current dividend $(D_0) = D_n (1+g)^n$

Growth rate = $(D_0/D_n)^{1/n} - 1$

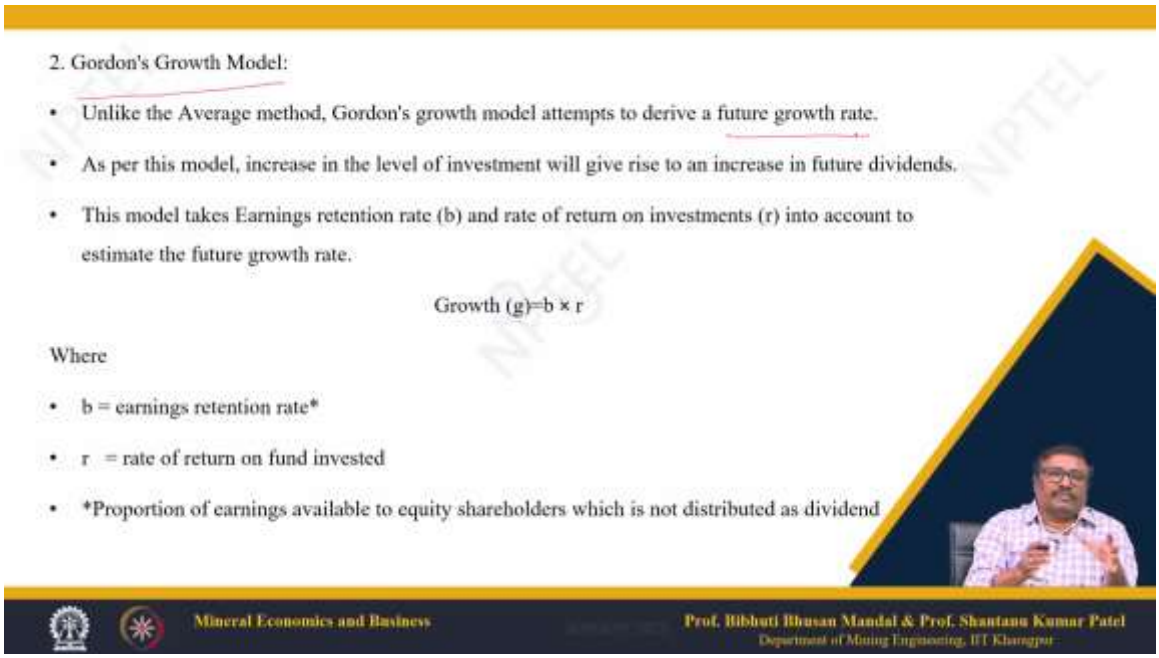
Where,

$D_0$ = current dividend

$D_n$ = Dividend n years before

g = growth rate

From there we can calculate the growth rate.This is the averaging method that we know, this end and the other end after n years. So, from there you can calculate by averaging the whole thing, and we take g as the growth rate, and it becomes g equal to $D_n$ by $D_0$ raised to the power 1 by n minus 1. So, unlike the average method, in Gordon's growth model, it attempts to derive a future growth rate. So, according to this particular model, an increase in the level of investment will give rise to an increase in future dividends.




So, in this model the earnings retention rate apart from a constant flow of dividend, what we are we are expecting that you are if your retention of earning that means, you are investing more from the profit that you are earning and rate of return on the investment into account, then we can estimate the future growth rate as:

Growth (g)=b x r

Where

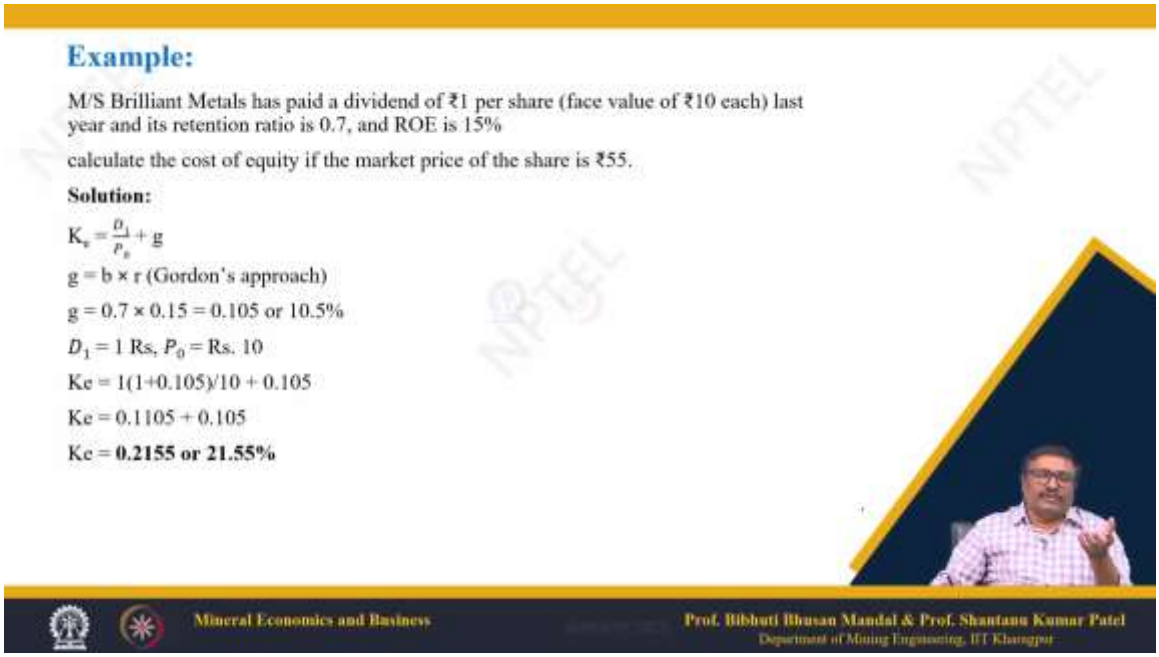
b = earnings retention rate*

r = rate of return on fund invested

*Proportion of earnings available to equity shareholders which is notdistributed as dividend

That means, a part of the earning is retained back to the back to the company itself for investment and growth of growth of the company. Now, we will take an example to understand this.

So, for example, this company brilliant metals has paid a dividend of rupees 1 per share for the face value of 10 rupees is ah for share for each share. year and its retention ratio is 0.7. That means, 70 percent of the earning is used as a retention of earnings and reinvested for the purpose of growth of business. Now and return this rate of earning is 15 percent, then we can calculate the cost of equity if the market price of the share is 55, we can now calculate as this. So, the cost of equity as we know that d 1 by p 0 plus g that we have seen in the few slides before.




Now, as you say in Gordon's approach, we are calculating the growth rate as the product of B into R. So, here the retention rate is 0.7 and the rate of earning is 0.15 means So, the growth rate will be 10.5 percent effectively, growth rate will be calculated as taken as product of these two and the effective growth rate will be 10.5 percent. So, if the dividend is say rupees 1 which is given and the face value of the share is rupees 10, then putting this value we get the cost of equity will be 21.55 percent, 21.55 percent would be the cost of equity here. We will now go to a combination of this thing your preference

shareholders which is a different kind of share as we have learnt earlier. The preference shareholders are the paid dividend or paid dividends at a specified rate.

Here the dividend is not varying. So, it is decided before. So, this is divided decided on the phase value when we are issuing And this is not charged as an expense, the dividend charge as that it is not charged as an expense. So, you do not get any tax benefit.


So, that way it is not exactly like a dividend charge, but it is treated as an appropriation of the after tax profit. But dividend paid to the preference shareholder does not reduce the tax liability of the company because it is not being charged as an expense. So, the cost of preference shareholders can be considered in two different ways. One is the not redeemable preference share capital preference share capital can be redeemed or it cannot be redeemed depending on what kind of contract we have with the company.

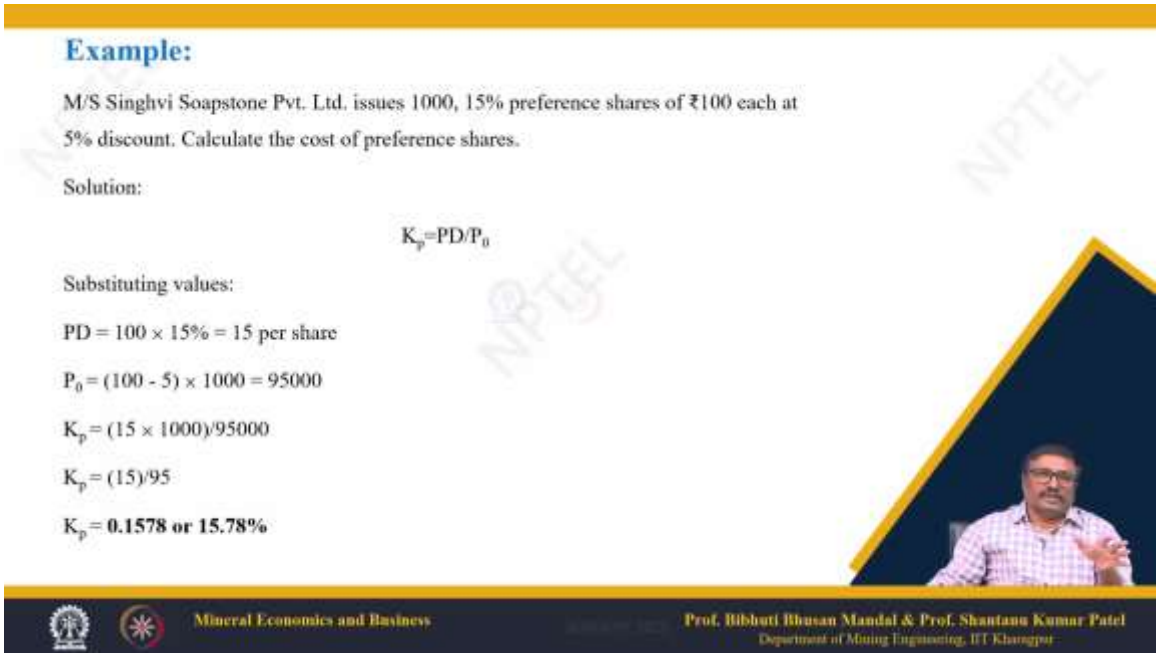

So, when it is not being redeemed then what is happening? then the cost of a redeemable preference share is similar to the calculation of perpetuity because then it is open ended, the other side is not fixed when the share can be redeemed. So, the cost is calculated by dividing the preference dividend by the current market price and net proceeds of the issue. It is more or less similar to previous calculations like where we have the cost of this irredeemable preference share is given by:

$K_p=PD/P_0$

Where:

- **PD** = Annual preference dividend
- **$P_0$** = Net proceeds from the issue of preference shares

You are getting it fixed; it is fixed. So, I mean, you do not have to think about the growth rate here, and P naught is the net proceeds from the issue of the preference shares. Now, net profits - this is nothing but the issue price minus the expenses like the flotation cost, as usual. So, if the issue price is not given, assume it to be equal to the current market price - whatever it is - that the company is issuing the same thing at the same price, if it is not giving any additional value or discounted value.




So, the current market price is the issue price, and of course, the expenses—if the flotation expenses are not given, then we assume this as 0. It becomes pretty simple, just like in calculating the P D divided by P naught, which is the cost of capital related to the preference shares that cannot be redeemed. So, it is perpetual—that means it goes on and on and on. Now, say Mr. Singhvi Soapstone Limited issues 1,000 preference shares at a 15 percent dividend and 100 rupees each—the share will be the face value is 100 rupees each, but while issuing, it is giving a 5 percent discount.

So, what is the cost of these preference shares? It is:

$K_p=PD/P_0$

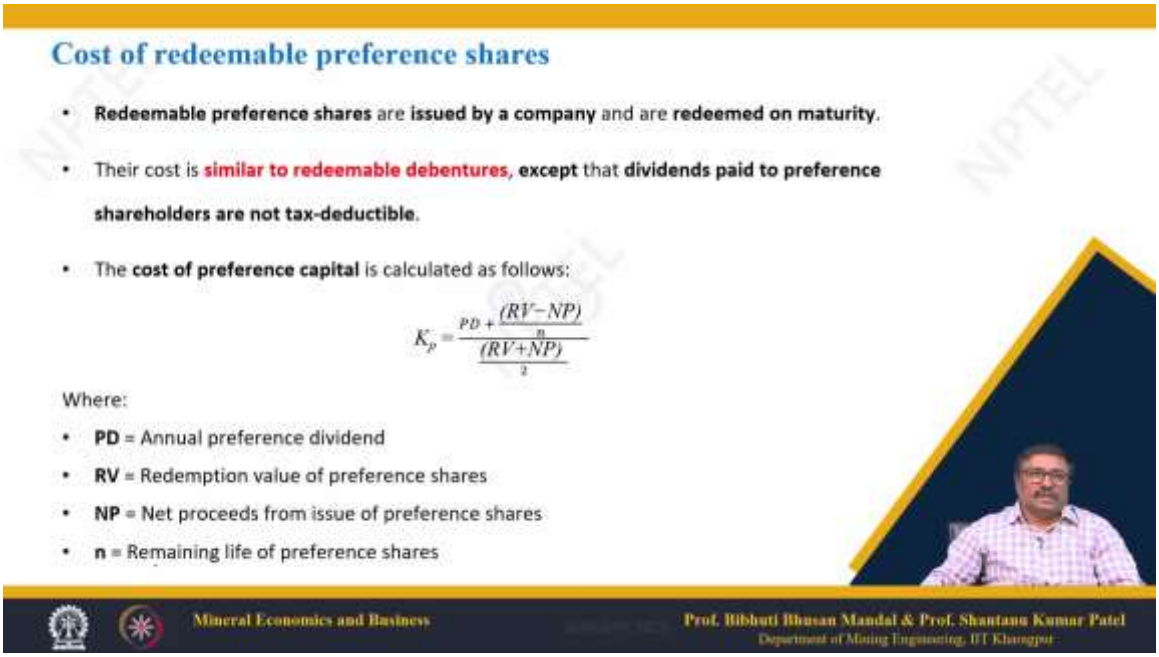
So, PD is the face value is 100 into 15 percent. So, you get 15 rupees per share. Every year, and here P naught is given a 5 percent discount.

So, the price becomes 95 rupees into 1000. So, we actually get 95,000 rupees from the market because we are giving a 5 percent discount of 5,000 rupees. So, if you now calculate the cost of capital, it is the 15 rupees per share dividend multiplied by 1,000 shares that we have issued in the market, but we actually received 95,000 because we gave a 5 percent discount. By 95, just by calculation, it comes to 15.78 percent. 15.78 percent is the cost of capital. That means the cost of using the capital that we have got

from the market by issuing preference shares, where we have committed to give a 15 percent dividend every year, and while issuing, we gave a 5 percent discount.

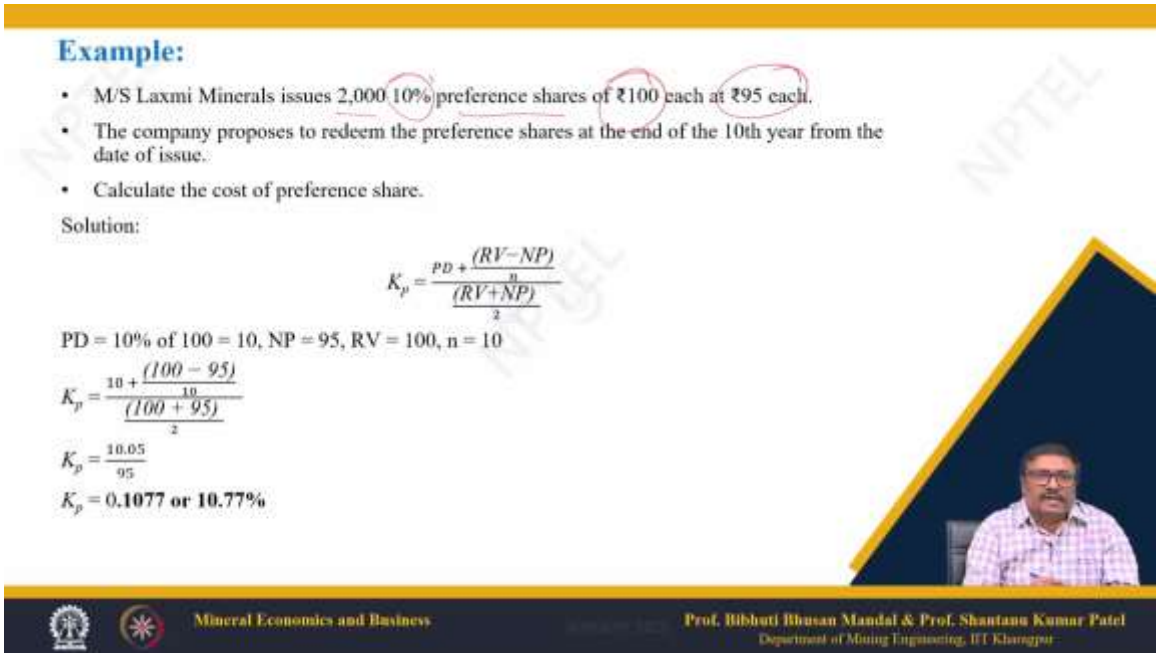
Now, in this case, the cost of redeemable preference shares—these are to be redeemed on maturity. When the term matures, then it has to be—that means the company takes it back and then the original price at which it was sold has to be paid back to the investor. Now, the cost is similar to redeemable debentures—absolutely the same—except that the dividends paid to preference shareholders are not tax-deductible, as we have repeatedly mentioned. This is the major difference between preference shares and dividends. Now, the cost of preference capital is calculated the same way:

- $$K_p = \frac{PD + \frac{(RV - NP)}{n}}{\frac{(RV + NP)}{2}}$$



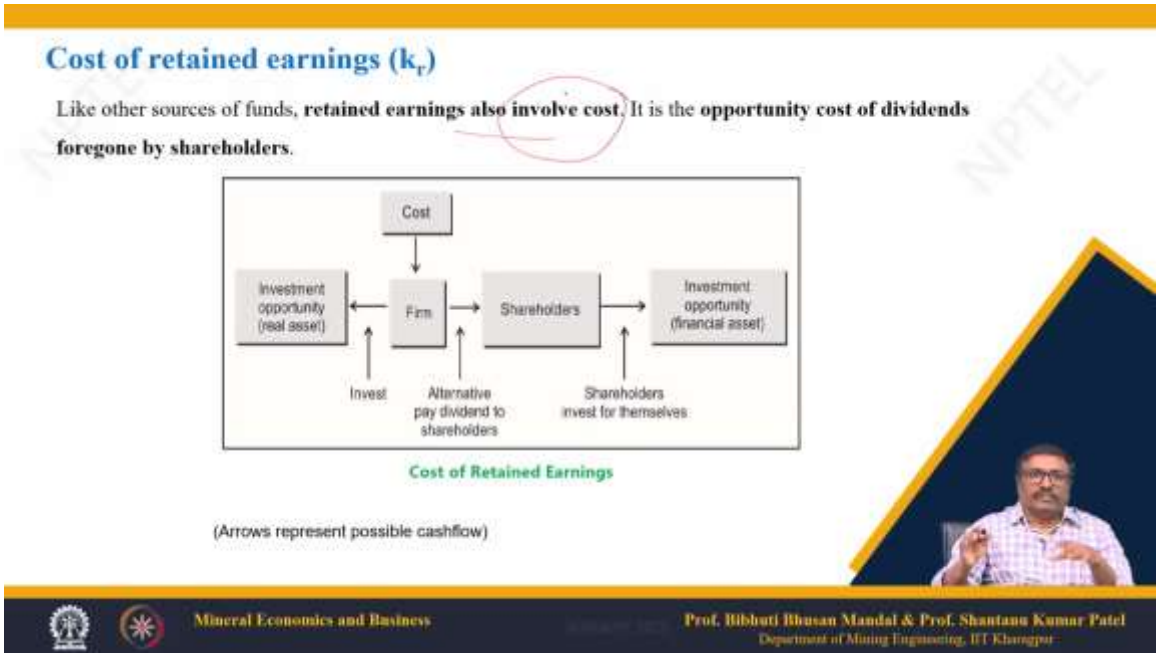

Where:

- **PD** = Annual preference dividend
- **RV** = Redemption value of preference shares
- **NP** = Net proceeds from issue of preference shares
- **n** = Remaining life of preference shares




So, now PD is the annual preference dividend. RV, as I said, is the redemption value; NP is the net proceeds from the issue of preference shares, and N is the remaining life of the preference shares. So, from here, we can find out the cost of capital for the redeemable preference share. For example, in this case, what we have is that PD is 10 percent of 100 because Messrs. Luxmi Mineral has issued 2,000 preference shares with a 10 percent dividend commitment and a face value of 100, but at 95 as again it is issued because there is some flotation cost involved So, now, in this case it seems that some discount has been given. So, the company proposes to redeem the preference shares at the end of the 10th year of the date of issue. So, now, we have different values here, the redemption value is 100 for each preference but at the time we of issue we actually got 95 rupees here, because we given we have given some 5 percent discount.

So, now from here we get 10 percent of 100 is the PD value that is 10 and the net profit is 95, because we have given again 5 percent discount in this example also, but the redemption value is 100, because cost of the face value of this preference share was 100. Even if you have given as a discounted rate when you redeem then you have to pay 100 rupees and n is the 10 years period at the end of this we are redeeming the preference shares back to the company. So, if you calculate this put all these values here then you will get the cost of preference share ah capital is 10.77 percent.

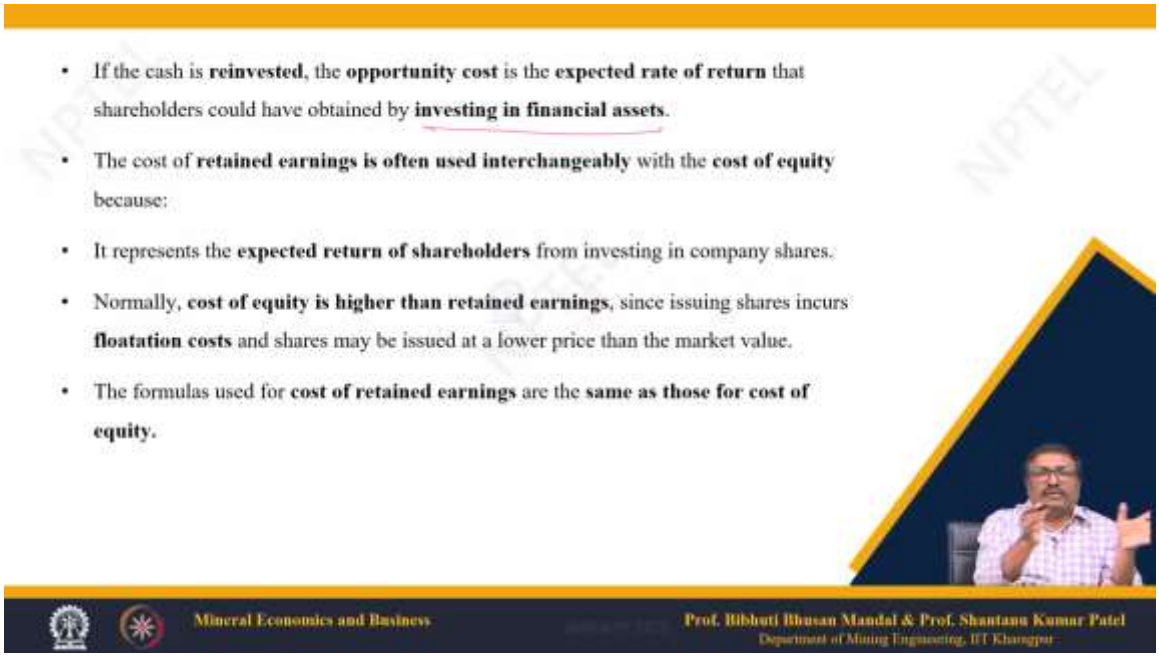



This is how it is calculated and this is also you must remember and practice also this problem whatever I am giving in this or we are giving this in the lectures then you must practice this with different values and see how it changes. So, we become proficient in understanding the problem and solving the ah the the the exercises that you get here. And from there also you can think of complications or you can you can also read other books and other resources where more complicated problems are given, but the basic ideas of this will help you great ah in solving the ah problem. Now it is the last one in this lecture is the cost of retained earnings. See like the other sources of funds retained earnings also involve cost.

So, this is a slightly peculiar concept because we are reinvesting a certain part of earnings back into the business. So, it is the opportunity cost of the dividend foregone by the shareholders. The shareholders could have received this money, but we have not given it. What have we done? That part of the earnings we have kept and used back for investment.

Otherwise, we could have given it to the shareholders, who could have used it for other purposes. At the same time, we, being the owners of the firm, So, instead of giving or retaining it in the same business, we could have invested it elsewhere—for example, in

some real asset. So, in both cases, the opportunities were missed. So, what we have foregone is the opportunity in both cases—this is important.




The shareholders could have invested elsewhere, but instead, the owners of the company decided that a certain part would be reinvested. So, here the firm had two options: it could have invested elsewhere, or alternatively, we could have paid dividends to the shareholders. But what we have done is reinvested in the same firm. Thereby, the shareholders also lost the opportunity to invest. Had they received it as dividends, they could have used this extra dividend in other financial assets. So, here the cost of capital will be taken as the opportunity cost of the dividend foregone by the shareholders.

So, if the cash is reinvested as I have I was telling you the opportunity cost is expected rate of return that the shareholders could have obtained by investing in financial assets. So, if you are losing say 10 rupees or 100 then if you are if you think that if I do not do this, if I invest this in other financial assets then why how much I could have received from the ah from that opportunity that we are losing. And the cost of retained earning is often used as interchangeability interchangeably with the cost of equity because it represents the expected return of the shareholders from investing in the company shares. Because, it is the same thing, because if you are not using this as shares same money, then the expected return will be taken as the expected return per share.

So, it is as good as having the proportionate number of equities in the same company, which we are not actually doing, we are actually not giving them as extra shares, but we are reinvesting. So, net worth of the company increases definitely, but the shareholders are not getting direct benefit from there as dividend. Now, the cost of equity is higher than the retained earnings. Since issuing shares incurs flotation cost and shares may be issued at a lower price than the market value. So, instead of going of issuing the shares in the market.

and getting more your capital for reinvestment in the for for investment in the company. The this in in here what is happening the retained earnings are having that kind of benefit we are not using any any kind of flotation cost, we are not using any kind of discount here. So, in that case the cost of equity is definitely higher than the retained retained earnings. because of equity it could have been sold at a lower price or you have you must have used some definitely there will be a flotation cost. So, in that case retained earning is a better option that way from that point of view.


Therefore, the formula used for the cost of retained earnings is the same as that for the cost of equity, as simple as that. Here, what we have not discussed is that there are two more methods for the calculation of the cost of equity, as I said in the beginning, which will be taken up in the next two lectures. And for understanding these things better or in

detail, you could definitely visit www.ici.org or books like Financial Management by P C Chandra, or there are many books available and many internet resources for understanding and then honing your skills for practical applications in a much, much, much better way. Thank you. Thank you very much.