Mergers, Acquisitions and Corporate Restructuring
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Module No # 04
Lecture No # 19
Valuation in M and A: Valuation of Synergies - 2

Hello friends welcome to one more session on merger's acquisition corporate restructuring. In the previous session we started about valuation of synergies in this session also we continuity evaluation of synergy.

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- Synergies
- Financial synergy
- Cost of capital
- Coinsurance effect
- Valuation
- Real option

So the concept that we will discuss in this session is synergy assets recapitulation of that. Then specifically what; is financial synergies then how do we value the financials, energy. And besides this operating scenario that we discussed in the previous session and the finances which will be discussing in this session there could be also other forms of synergies attributed to mergers and acquisition.

Specifically real absence energy we will also discuss about those concepts and these are the keyword that we have there is synergies financials energy cost of capital, coinsurance effect valuation and real option.

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Synergies in Mergers and Acquisitions (M&A)

- Synergy is the additional value that is generated by combining two firms, creating opportunities that would not been available to these firms operating independently.
- Very often while announcing M&A deals, company executives mention about the synergies attributable to the particular deal.
- Synergies can be broadly classified as:
  - Operating Synergies (covered in Session # 18)
  - Financial Synergies

So as a recapitulation synergy can be again defined as the additional value that is generated by combining 2 forms because of excellencies because of increase in competencies because the reduction cost whatever that may be. So that the combined company can get advantage of that and create some extra value for the stakeholders. And yes as you discussed, the only companies announced M and A the executives talk about their synergies possible we discussed about certain such cases in the previous session.

And broadly synergies are classified into financial synergy and operating synergy and operating synergy we have already covered in the session number 18. So in this session we will be focusing more on the financial synergies.

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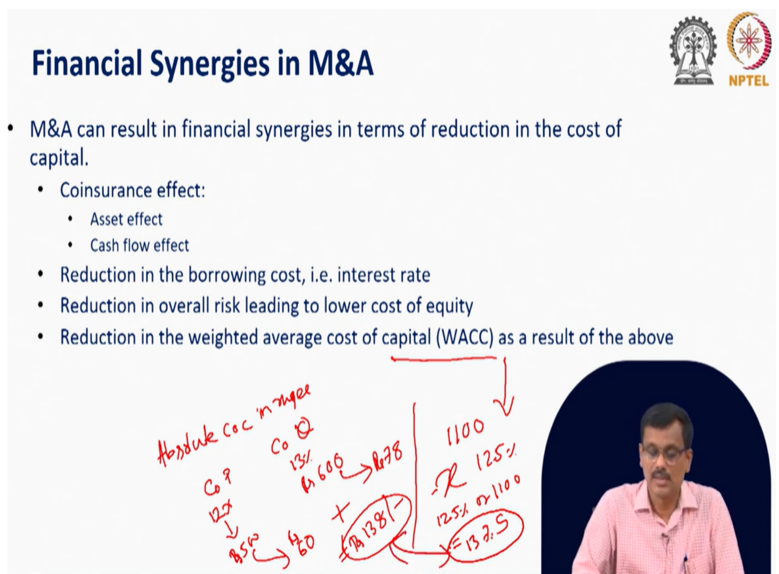

So coming to (())(02:12) main, behind this energy is that yes the combined company can get advantage of certain things and which will help to reduce the cost of capital. And the reduction cost of capital is taken as a proxy or a measure of finances energy impact of financial synergy on the combined company. What happens when the 2 companies get formed? So 2 companies have assets combined together they become bigger company a, bigger company can have more bargaining power or at least more ability to borrow.

And the borrowing is beneficial because typically the cost of borrowing is less than cost of equity. In that case the overall cost of capital with increased borrowing is going to go down. So combined company will be able to raise more debt relative to the individual company pre-merger. So that is the philosophy here so, they have more assets to mortgage and the assets can also complement each other.

And the risk of the company will be lower that is expected and because of that the lender may a charge a lower interest rate. At the same time another effect is the cash flow effect and this cash flow effect and asset effect are part of coincidence effect. So in Casper if it what happens it is possible that the cash flow, of 2 different businesses 2 different companies when they combine together they may not be that much related.

So when the related is not related then more diverse position will be there so a bad situation in one business can be compensated by the good system another business. So overall the risk of the company because of diversification can go down and because of that the cost of debt or cost of, capital can also go down that is what the argument behind this in the coincidence effect.

And as you discussed because of the coincidence effect and increased borrowing power asset size cash flow etc., the borrowing cost can go down that is called the interest rate and that is also called the cost of date. Then since the overall the risk of the company is expected to be lower as a combined, company in that case it will lead to lower cost of equity. And once this individual cost of capital goes down so; we can expect that divided average cost of capital of the company also goes down.

So that is the impact of mergers acquisition on work and that leads to financial synergy so we have different ways to value this viruses energy can we estimate the finances energy that is going to be, attributed to this emerging acquisition can you estimate that. So there are different

framers so we will be discussing one of one such framework in this session. And then we will also take a particular exercise for that so what happens is?

General framework for this calculation finances is that we have to find out the absolute cost of capital that means absolute cost capital in rupee let us say, suppose the rupee developmental company cost of capital in terms of rupee. Of the company let us say their company b and company q are getting merged so we have to get the absolute cost of capital for P as well as Q. So let us say the absolute cost of capital of the company could be 12% pre-emergent for company Q could be 13% pre-merger and company P may have.

Let us say rupees 500, total capital company Q may have rupees 600 total capital so in that case the absolute capital cost of capital for this company P is nothing but 12% of five point comes to 60 rupees and for company Q it is 13% section comes to rupees 78. So simple combination of these 2 cost of capital this plus this pre-merger as if they are combined by their numbers so that comes to, rupees 138.

So now post-merger we have to see similarly what is the absolute cost of capital? So let us say that comes in this framework only. So we will have pro post-merger the cost of capital of the company post-merger total capital of the company multiplying these 2 whatever that comes to that comes to x. So x minus this particular pre-merger that; gives us the value or impact of reduction in, the cost of capital or change in the cost of capital every year.

So that is something going to be sets off first it is x let us say combined company this company simply gets added in total capital 1100. And because of the impact of merger what is average cost of capital is going to be let us say 12.5%. So 12.5% of 1100 comes to 137.5 let us say so now the difference, between; these 2 gives us the value of financial synergies.

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Exercise on Valuation of Synergies – Financial Synergies

Exercise 19.1: Alpha and Beta are going to be merged to form AlBe. From the relevant information given below, find the present value of financial synergies.

Particulars	Alpha	Beta	Al-Be
Total capital, pre-merger (Rs. Million)	1,000	1,000	2,000
Weight of debt	25.00%	30.00%	??
Cost of debt - pre-tax	10%	12%	11%
Marginal tax rate	25%	25%	25%
Beta of stock of Company, pre-merger	0.8	0.9	
Risk free rate of return	7%	7%	7%
Equity market risk premium	8%	8%	8%
Expected reduction in the unlevered beta of combine company			0.10
Weight of respective company in terms of total capital	0.5	0.5	

So let us take an example here we have alpha and beta the 2 companies together and from the given information below we have to find out the value of financial synergies. The total capital pre-merger of alpha is 1000 and 1000 and combined together Al-Be that is a combined company 2000 and the weight of alpha, weight of debt in alpha is 25% similarity 30%. The cost of date is given as 10 and 12% and post-merger the Al-Be expected to have a cost of date of 11%.

And for pre-merger post-merger all the companies are subject to 25% corporate tax rate and beta of this particular stock alpha and beta stock are 0.09 respectively. Then we have respiratory return and market, risk premium and when the company gets combined so it is expected that the only word beta of the combined company is going to go down by 0.10. So in that case we have to find out the only word beta of the combined company by using suitable formula that we discuss in cost of capital session and then will -0.10 from there.

So that will give us the only word beta adjusted for m and effect and, with that only word beta we will find levered beta of combined company then that can be used to find out the cost of equity of the combined company by using capital asset pricing model. And the weight as you can see here 1000 nothing but 50% weight of a alpha and 50% weight of beta.

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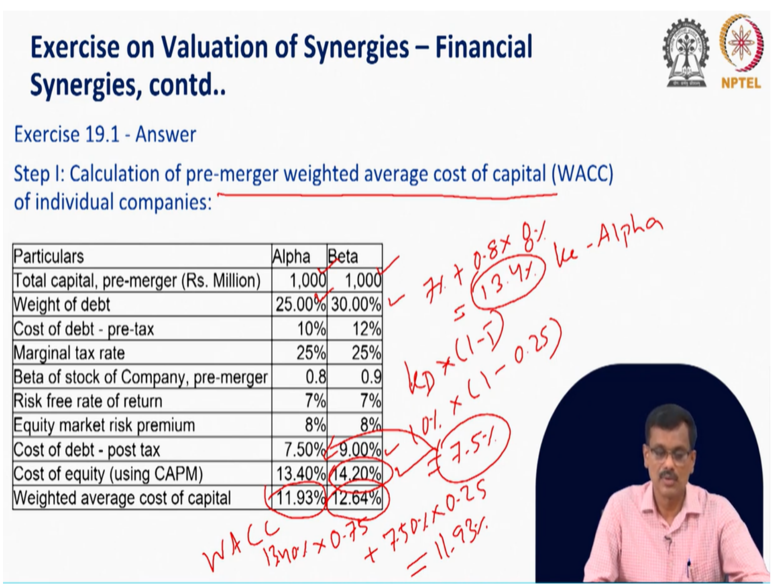

So this is the step that you have, we have to calculate the pre-merger, weighted average cost of capital of two different companies as alpha and beta. So we have seen 1000 million this company size debt is 25% and 30% cost of date is 10% and 12% so pre-tax. So post tax cost update that comes to 10% into 1 - that is post pre-tax into 1 - t that. So in that case 10% into 1 – 0.25 so that gives us 7.5% as the cost of date post tax of company alpha.

Similarly the company beta has post as cost updates of 9% is 12% into 1 - 0.25 and using capital asset pricing model we can find out the cost of equity of Alpha that comes to capital asset pricing model nothing but risk premium rate of return plus beta that is 0. 8 into risk premium that is, again 8%. So that gives us 13.4% is cost of equity for alpha similarly the cost of equity for beta is found in 14.20% and this 13.54% is the cost of equity into weight of equity because weight of debt is 25 %.

So weight of equity is equal to 75% that will be zero point seven five and cost of date, is 7.5% that is post tax into weight of date comes to 25% 0.25. So that gives us 11.93% as the weighted average cost of capital for company alpha. And similarly one can also find out the weighted average cost of capital of 12.64% per company beta. So the first step is to find out the weighted average cost of capital of alpha and beta we calculated 11.93%, 12.64% respectively.

The next what you will do we will find out the weighted average cost or capital of the combined company if merger has taken place with a merger effect.

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Exercise on Valuation of Synergies – Financial Synergies, contd..

Exercise 19.1 – Answer, contd..

Step II: Calculation of average of WACC of both companies:

Weight of pre-merger capital of Alpha x pre-merger WACC of Alpha + Weight of pre-merger capital of Beta x pre-merger WACC of Beta =

0.5 x 11.93% + 0.5 x 12.64% = 12.28%

So once you have the cost of capital of the companies separately that is 11.93%, 12.64% per company alpha and beta separately. We can also make a simple, combination of that with the respective weight of two companies both the companies are 50% weight in the combined company. So as if merger has not taken place so in that case just make a combination of individual cost of capital without merger effect.

So in that case 0.5 in 11.93 + 0.5 in 12.6 but that comes to 12.2% is the cost of capital for the, company as if the merger has not affected but the combined company assess. Similarly then what you do next thing you have to find out the voted average cost capital of the combined company post merge.

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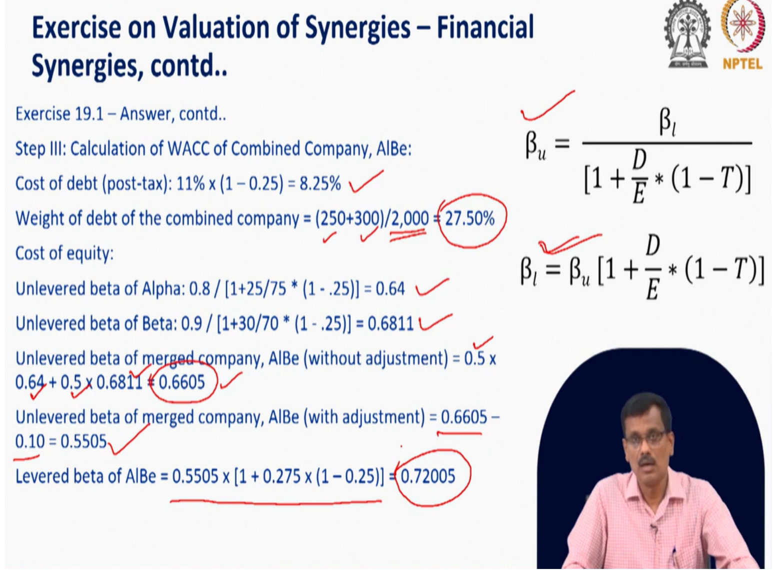

So in that case what we will do we will find out the cost of date of the company is going to be 11% the pre-tax, the post-tax 11% 1.1 minus tax rate that comes to 8.25%. And the weight of the date in the combined company is going to be this much because earlier in the alpha company alpha 25% was the date of total capital. So total capital is 1000 so 25% of that comes to 250 similarly in beta 30% date was there so it comes to 30% of once has come to 300.

So total 550 of total capital now 2000, 1000 + 1000 so that gives us 275.5% the weight of the debt in the combined company because we need this weight update to find out the weighted average cost of capital. And then for the cost of equity what you will do will use the capital asset pricing model for that we have to find out the beta. And we already have the beta that is lever beta, of the company alpha and company beta separately.

Now we have to find out the combined companies only word beta then do the adjustment then use that for the calculation of cost of equity. So this is our formula for we discussed in the cost of capital session that is how to convert lever between non-levered beta. Similar this formula is to use to convert unlevered beta to lever beta so applying this, formula the unlevered beta of alpha comes to 0.64 and unlevered beta comes to 0.6811.

And unlevered beta is also known as the asset beta of the company so then unlevered beta the asset bit of the most company without any adjustment comes to because the both the companies have 50% weight. So we attach 0.5 into 0.64 0.5 to 0.6811 so that gives us 0.6605 that is the unlevered beta of, the combined company or most company without adjustment. But it is given that because of the merger the risk is going to be lower so that is why the beta of the company is asset beta unlimited is going to be lowered by 0.10.

So then we remove -0.1 there comes 0.5505 so this is the unlevered beta adjusted for the combined company and using this formula we can find out the levered beta of the, combined company Al-be. So that gives us 0.7205 and this will be used to find out the cost of equity of the combined company post-merger.

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Exercise on Valuation of Synergies – Financial Synergies, contd..

Exercise 19.1 – Answer, contd..

Step III: Calculation of WACC of Combined Company, AlBe, contd..:

Particulars	AlBe
Total capital, pre-merger (Rs. Million)	2,000
Weight of debt	27.50%
Cost of debt - pre-tax	11%
Marginal tax rate	25%
Risk free rate of return	7%
Equity market risk premium	8%
Levered beta of combined company	0.72
Cost of equity (using CAPM)	12.76%
Cost of debt - post-tax	8.25%
Weighted average cost of capital	11.52%

So 2000 now combined company has 1000 + 1000 2000 rupees of capital million capital weight update average calculated here 27.5% then cost update pre-tax11%. So post tax comes to rate 0.25%, 11% into 1 - 0.25 tax rate is there then risk rate of return this one. Then using capital asset pricing model the and taking 0.72 as the levered beta then we got the cost of equity is today 12.76% that is nothing but 7% + 0.78 into this premium that is 8% so that gives us 12.76% cost of equity.

And cost of debt, is there 8.25% so combined cost of capital that is companies whatever is cost capital comes to 11.52%. So if you look at the calculation here in our previous slide the combined company the merger had not affected although the combined cost of capital is a 12.28. So 12.28 have become now 11.52% so the difference, between 12.28% and 11.52% is nothing but the impact of the mergers acquisition on the cost of capital.

And this one can also find out in absolute value then you can phone the put a value because valuation has to be in absolute not in percentage or something like that. So in that case we have to find out what the absolute value of present value of the financial, synergies.

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Exercise on Valuation of Synergies – Financial Synergies, contd..

Exercise 19.1 – Answer, contd..

Step IV: Calculation of PV of Financial Synergies:

Cost of capital, in absolute rupee: Cos of capital of Alpha + Cost of capital of Beta =

11.93% x 1,000 + 12.64% x 1,000 = 119.30 + 126.40 = Rs.245.70

Cost of capital of merged company, in absolute rupee = 11.52% x 2,000 = Rs.230.40 million

Net impact, annually = Rs.245.70 million – Rs.230.40 million = Rs.15.30 million

PV of financial synergies (using PV of perpetuity formula) =

Rs.15.30 million / 0.1152 = Rs.132.81 million

So then step 4 so we have 11.93% earlier pre-merger 1000 so absolutely; we had this much that is 245.70 absolute cost of capital in rupees term 245.70 million. And the with the new cost of capital that is 11.52% so 11.52% into the combined companies total cap 2000 that gives 230.40 million absolute. So now earlier the cost at 245.70 now we are going to have 230.40 so impliedly we are saving 15.30 million annually.

And if you are early when you are saving 15.30 million and if you have to find the value in perpetual company is going to be there for all the years to come and this saving is going to be, there and all this to come so what you will do? We will find apply the annuity perpetuity formula the present value is equal to A by r. So A is the amount of savings that is 15.30 r is nothing but the work of the company combined company post-merger. So that gives us 132.81 million the value of the present value of finances synergies.

So this is the way one can find out the present, value of financial synergies having talked about the financial synergies and calculated that we also have different other forms of synergies. Although we classified them as majorly between operating and financial but there are other things also possible because the marginal equation is actually taking place. And the company combined company can take the advantage of that.

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Other forms of Synergies in M&A

- M&A can result in other forms of synergies:
- Asset reduction synergies
- Real option synergies (Bruner, 2004)
  - Growth option synergies
  - Exit option synergies
  - Options to defer
  - Options to switch (in terms of input mix, output mix, processes, etc.)

So coming to that we have, other options other synergies that is something called acid reduction. That means we discuss in other part operating synergy because of this combination so the certain redundant assets can be reduced can be removed and the company can get some value by disposing those assets. For example the 2 companies come together and they have got the supply chain logistics they have let us say the retail, network where they have got transportation transport equipment's.

So now they may not need so many; transport equipment's vehicles etcetera so certain transportation equipment's can be actually disposed of and that money can be realized some cash can actually come. So that is called asset reduction because to do the same thing together they may need less number of less amount of assets that is called, acid reduction. Then another synergy that comes to in merger equation is called real option what is real option?

Before that used to know what; is option is nothing but you have a right to do certain things but not the obligation. And in anybody who has gone through financial markets, subject or their investment management or derivatives for that matter one must have come across something called, call option and put option. So that is called the financial option so simply if I have to recollect the call option is nothing but you have a right to buy something in future but not the obligation.

So you take a position that yes we got an agreement with someone that I have right to buy something from X but I may I may not exercise that option. So I have a right to buy that is called call option i, have right to sell it is called put option. So these are options when you talk

about there is essentiary in relation to financial assets. But there can option in with respect to real assets real assembly the company has together.

So company have options to do something or not do something so that carries those options can also be more when the merger acquisition takes place. So what the options they, company A and company B had individually pre-emerged they can have more such more options than that if the company gets merged. So that is called the real option and one can also find out those value using the optional variation for but that is beyond the scope of this particular course.

But this is also sensitize that yes other synergies are possible because real absence so coming to that real, options you have growth option synergies. So when the companies come together earlier if they are used to growth opportunities are individually now the growth option can be more because the company complement each other. They have more technology more better processes better inputs.

So that can lead to more growth for the company combinedly so that is called the growth option. In fact that, automatically gets translated in terms of revenue enhancement or cost reduction but. So in that case revenue announcement can be attributed to some sort of growth option in another growth option can be there because the operation to grow is higher as a combined company compared to the individual company.

Similarly there is other options called exit option so now since the, company has multiple business together the combined company may feel advantageous to exit certain businesses and use those proceeds for those business for a further expansion. Because when the company were separate even if they have some multiple businesses they do not want to leave that business.

But now combine the company of multiple business and it is in the combined resources, are there they can put those resources for something else. And so they can exit from maybe not non-profit or not so profit making businesses and put those reposts to some other better profit making businesses. Similarly one can have the options to defer that means the ability to defer a particular work to future is better if the company is actually combined compared to company which was actually, individually.

Because they can joint decide that is this particular distance expansion or something like that instead of executing today we can they can execute tomorrow. So in capital budgeting they talk about option to expand option to defer option to abandon because you may have certain business you will have like an exit we talked about option. So those things also are applicable in case of, modulation acquisition.

Then another beautiful option that gets attributed marginal equation is that because of these combination resources the company can possibly choose a different input mix. They were earlier used to some mix of input in terms of raw material let us say. When the combined company is there they can to do the same thing if the technical is feasible possible the company can choose a, different input mix.

Similarly the output mix also can change what the company produces individually separately and the company together. Now most company the mix of output the sales mix for that matter can actually differ and that differ the new mix can possibly lead to more revenue for the company. Similarly another thing that can be done is that the company has different processes, they can make a mix of the processes combine the processes get the best out of different processes and then that can result in cost reduction for the company or more efficiency for that matter.

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- M&A can lead to financial synergies in terms of reduction in the overall cost of capital of the combined company in comparison to pre-merger period.
- The present value of financial synergies is the present value of impact of reduction in the cost of capital in absolute rupee terms.
- M&A can also lead to real options synergies.

So in this way we discussed yes M and A can lead to finance synergies in terms reduction in the cost of overall cost of capital. The combined company in comparison to pre-merger period and the present, value of the financing is nothing but the present value of the impact of the reduction in the cost of capital in absolute rupee. For example in recapitulate if one had

absolute cost of capital of 100 crore rupees they combined together 2 companies pre-merger and the absolute cost of capital for post margin is let us say 90 crore rupees.

So difference between 190 is 10 crore that is nothing but, the impact of financial synergy on in terms of absolute cost of capital and the 10 crore is saved every year and take the use the value of present value perpetuity and find it out the find the NPV of finances energies. And so in that way another point is that M and A also can lead to real options synergies. So that we discussed that like financial option you have real options.

So with this particular, session we completed one particular portion of valuation that is and in this particular session we completed the synergies valuation and in subsequent session we will talk about other valuation methods that is called the valuation of company using assets. So asset based valuation method we will also discuss about certain nuances in valuation like when you talk about free cash flow we talked about, growth what you how do you estimate growth?

Then we will talk about when how do you decide that what will be the duration of the super normal growth? Because in free cash flow we talked about that in 2 stage model the company can grow at a higher rate for a certain period of time so whatever that period is equal to 5 years I mean what will be the criteria to the valid is this can be super, normal growth period higher growth rate is going to be this much.

Then after supernormal growth high growth is over then the company goes to the normal growth do you have anything to find out how normal growth is calculated? That will discuss we will also talk about special cases of valuation like these days you have lot of start-ups coming up so do you have the same method to apply for start-ups that, is can you do that or you have different method for that matter.

Because start-ups may not have any positive gas to net cash flow so how do you value that so we will talk about that and also we will talk about another method of relation called relative evaluation method. That nothing but instead of using the free cash flow or dual discount module or asset based model will compare the value of the, other companies in the similar sector using this comparative framework we can find out the value of our target.

Particularly these things are used for closely held or unlisted companies where you do not have a reference for a market value. So in that case is going to be useful and we have several

marginal accusation transaction taking place from the mergers and acquisitions transaction itself, we can get a value reference and find out the value of a your target as such. So those things we are going to discuss in this subsequent session starting from session 20 onward thank you and happy learning.