Business Analysis for Engineers
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Lecture-13
Special Accounts Illustrations`

In last class we were talking about how we can use different ways to record the correct value of cost of goods sold and inventory. And in that we found that there is an argument that can favour the first in first out and also a possible argument that can favour last in first out. While both of them are correct methods to record cost of goods sold and inventory. Now let us see what will be the argument that favours first in first out.

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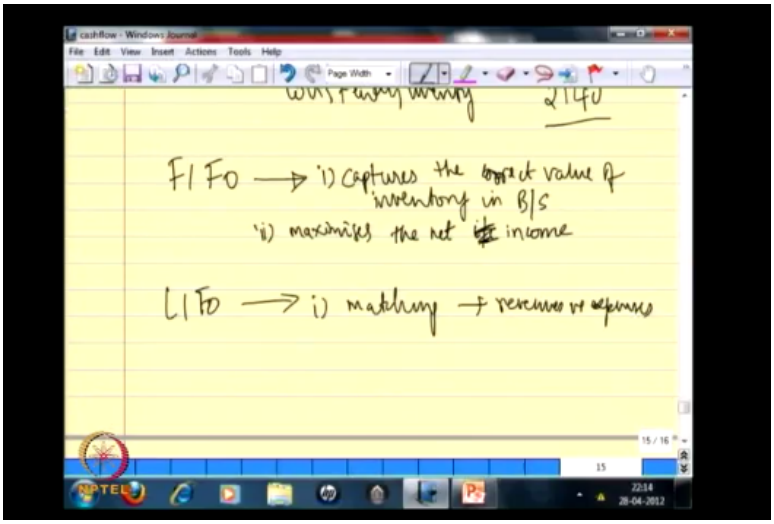

First in first out a essence is the inventory that gets acquired first gets used first and get sold first. So, that is the first in first out logic. Now why is that favoured over the last in first out 1 is for a purpose of accounting it is more accounting then conceptual that this first in first out captures the correct value of inventory that you see in your balance sheet, see in your balance sheet you see that there is some against inventory.

And as somebody using the balance sheet I would want the value of the inventory to be most recent and exact. Now this first in first out will capture the inventory that is not used in it is recent cost of acquisition. Because, what gets used is the inventory that was purchase sometime

back, which does not sit in your balance sheet any longer but because it gets consumed. And it goes as cost of goods sold. So, what sits in your balance sheet need not be the most reason.

But definitely not the first so, it gives a fairer estimate more correct value of the inventory. Because it is not the one that was purchase first it is not, I am not saying that it is most recent it is also include inventory that was purchase the most reason. But then the FIFO captures the correct value that is a correct estimate of the value of the inventory in your balance sheet. Because always I am more interested in knowing what is the fair estimate of my assert items in the balance sheet.

This is one accounting justification and other thing, is if I use first in first out is more likely who that it maximises the net income. Why it is very unlikely that the cost of inventory reduces there are cases, but in a majority of the circumstances that we handle. We have always found that the cost of inventory, the cost of certain material, the cost of acquisition is always increase your an year at least to cover inflation.

So, when the cost of inventory increases year after year if you use the first in first out method, what 6 in your cost of goods sold is that value that would have used. The maximum inventory that was purchased first right, because it is first in first out. And because the cost of inventory is rising over the accounting period in all likelihood the cost of goods sold will be lesser than it could have been add you adopted last in first out.

Because in that case the cost of goods sold would have recorded the cost of acquisition at higher acquisition prices that by reducing your net income. So, these two broadly are arguments that favour the use of FIFO effect likewise there are also arguments it support. There I should use last in first out, one relates to your principle of matching, principle of matching says revenue verses expenses, In a recording revenues in this particular accounting period.

You have two taken to account the cost related cost to this particular accounting period, and if it is a revenue that is happened in this time instant x. You have to necessarily take into the inventory that was purchase in the vicinity time period x fair enough. In other second thing is it

reduces taxable income, why because higher cost of goods sold though it reduces your net income the profit before taxes also relatively less.

And hence your income tax that you need to pay is less, your taxable income is reduced. So, these are two things two points that favour use of LIFO over FIFO. But ever told you that the most popular method that is use this the first in first out not that it is d only correct method that is the most popular method.

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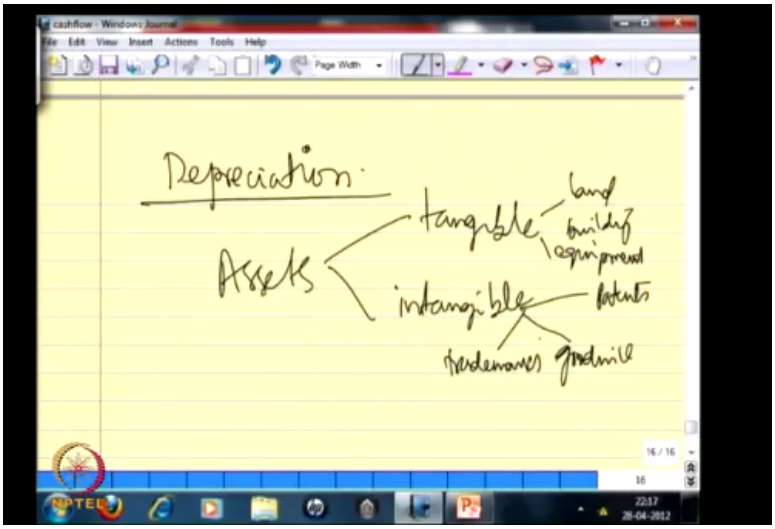

Now we are covered revenues we are covered cost of goods sold, the third thing that, I said I will be discussing in classes is the principle of depreciation. And is that again the different ways in which you can depreciation asset. I have told you that depreciation is an expense which is non-cash because cash does not really flow out of the entity. And it is an expense, because we have to charge the entity for using and equipment that gets depreciated.

Typically assets are of two types tangible and intangible asserts your tangible assets are your land, building, equipment and all that. Your intangible could be your patents, goodwill, trademarks. So, such non physical assets are your intangible assets. And we depreciate tangible assets and the equivalent for intangible assets is what we called as amortisation.

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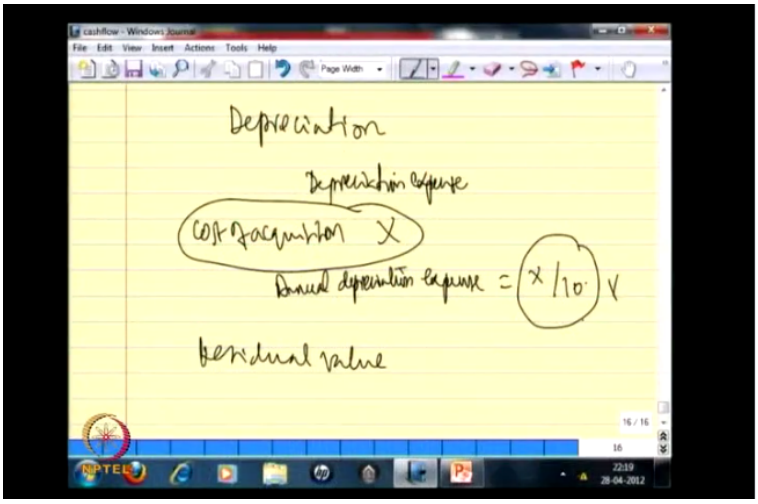

Now when we depreciate an asset I told you in the previous classes that it is only the capital expenditure that creates an asset that gets depreciated not the revenue expense. Because that gets return of in that particular year. So when an asset is depreciated it means that, we are charging the entity some expense for using that particular asset for that particular accounting period. So, which means when you do depreciation there is a depreciation expense.

And how does that get charge suppose the cost of acquisition of the assets is x, and let say the life of the asset is 10 years. When the annual depreciation expenses is x/10. So, every year in your income statement you would have a depreciation expense of x/10. And in your balance sheet that corresponding x/10 gets reduced in the value of the asset cost of x. So, you will have x accumulated depreciation x/10.

So, the final book value of the asset will be 9/10 of x then the second year it will be 2x/10. So, it keeps on reducing here after year while the annual depreciation expense is x/10. Now what you depreciate, you depreciate the cost of acquisition at times you might even have residual value for the asset. Residual value means the residual value is suppose after the life time of the asset, it can be sold for a particular value x.

Then that x is residual value, in this case for the sake of easy understanding let us say it can be sold for y then y is the residual value. Then what has to be depreciated is x-y if residual value is y.

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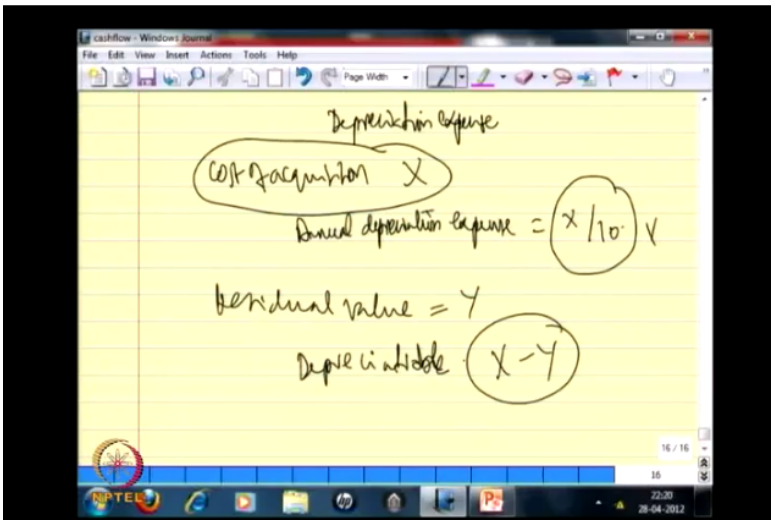

The depreciation x-y has to be depreciated or depreciable I do not know, whether that is the term that is commonly used let us say for understanding s.

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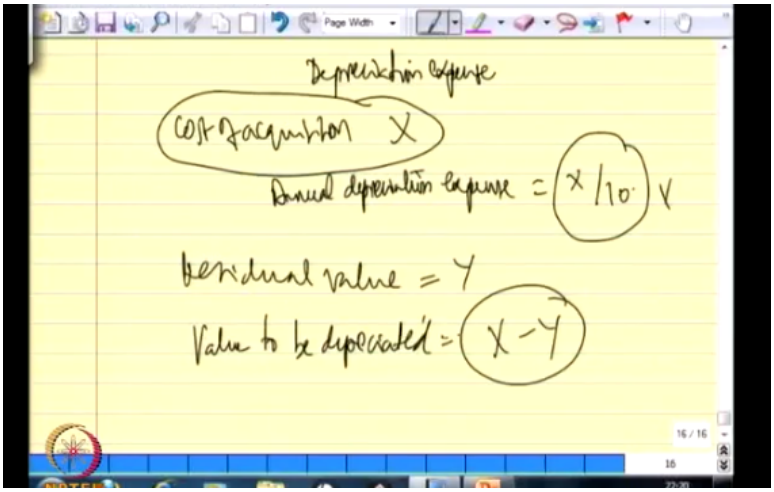

So, the value to be depreciated it is this that gets depreciated over a 10 year period. The question is are that just as we saw cost of goods sold different ways are that different ways in which assets can be depreciated yes there are, and I am wish just going to deal with two such methods. One is your straight line method which is just a linear depreciation, and other method it is called the years digit method.

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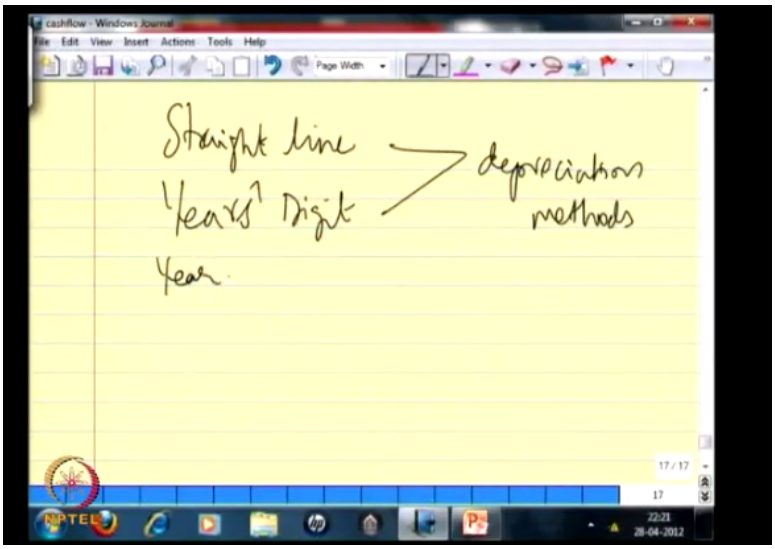

A straight line and years digit so these two the depreciation methods that will be seen for let say for an illustration that I purchase an equipment that is worth 1000 rupees. And estimated life of the equipment is 10 years and it has no residual value, residual value is 0.

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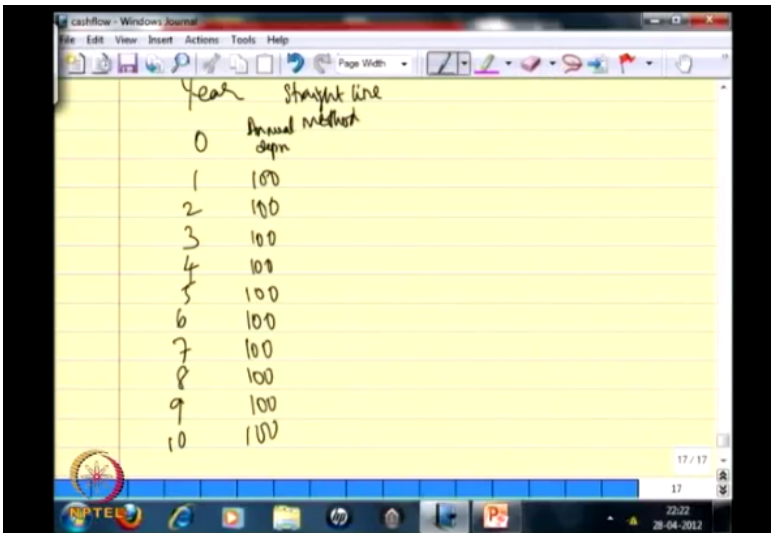

So, what do we do so, we are in year 0, 1, 2, 3, 4, 5, 6, 7, 8 9 10 let us I have a straight line method of depreciation here okay. So, in a straight line method what is my annual depreciation it is 100. So, every year it is 100, why because the cost of acquisition is annual depreciation, cost of acquisition is 1000.

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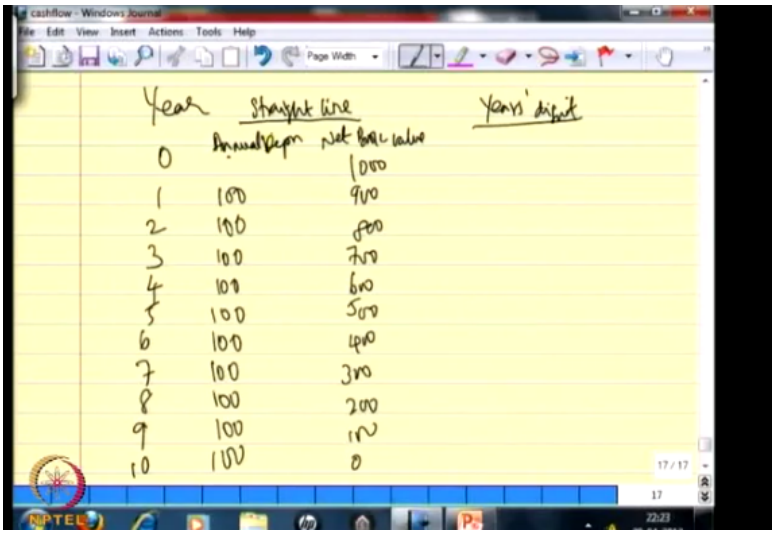

And residual value is 0 and it is a 10 year life time so, the annual depreciation is 100 what is an net book value. At year 0 we just purchased and we just purchased net book value is 1000, and finally it drops by 100 every year. And the net book value the end of the last year is 0. This is a very straight forward case, this is a straight line method of depreciation. Then next thing is called the years digit, now in a years digit the depreciation rate is no longer linear.

We are not adopting straight line method we are not hence taking a linear rate of depreciation. In this case it is 10 percent every year then what is the rate that is adopted. The depreciation rate is a fraction that is calculated by one particular method. In this case it is 10 years, so let say the, we call it these sum of the year digits. In 10 years means n*n+1/2 is 55.

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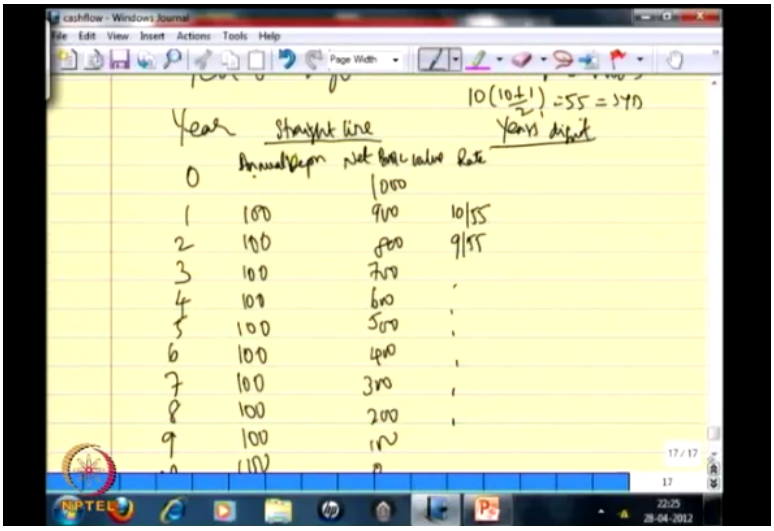

How do we get this 10*this I called the sum of the years digit S/D and this forms the denominator and the rate depreciating rate is calculated this way. So, the denominator is the sum of the digits 55 that is constant. In the numerator it is n that is the total life of the asset so, the rate of depreciation for the first year is n/55, for the second year it is n-1/55, for the third year it is n-2/55 and likewise keeps dropping down. So, the rate of depreciation keeps changing in this particular fashion and so on.

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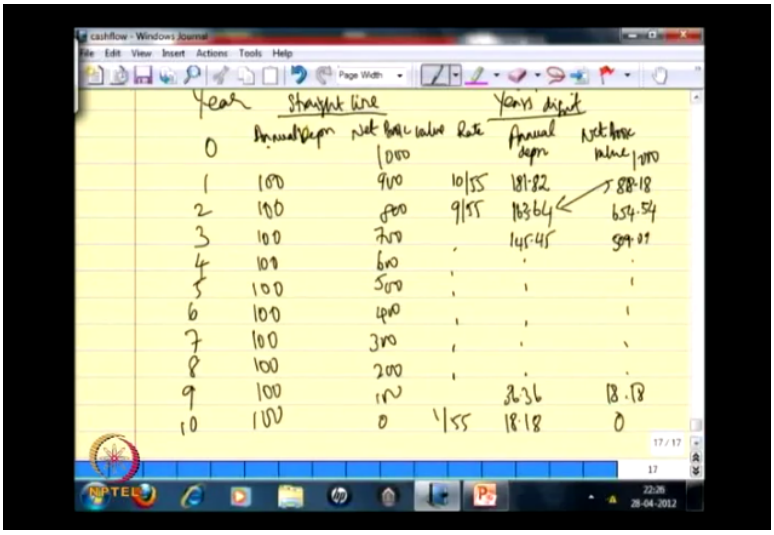

Till you get 1/55 here now what will be an annual depreciation in this case 10/55 of 1000, 181.82, then what is your net book value. At year 0 it was 1000, now it becomes 818.18 and in the second year your annual depreciation becomes 163.64, 9/55 times 1000. So, your net book value is this-this so, third year your annual depreciation 145.45. Your net book value is 509.09 likewise this also keeps on dropping.

And you will see in the year ninth year we will have the annual depreciation is 36.36, 18.18. And here the depreciation is 18.18 and the net book value 0. In both these cases the net book value the end of the lie of the asset is 0. Now what makes the difference, the difference is that the annual depreciation in the case of straight line method is 100. In the case of the years digit method keeps change now y is this relevant for hard discussion. Now if you tied a plot a graph.

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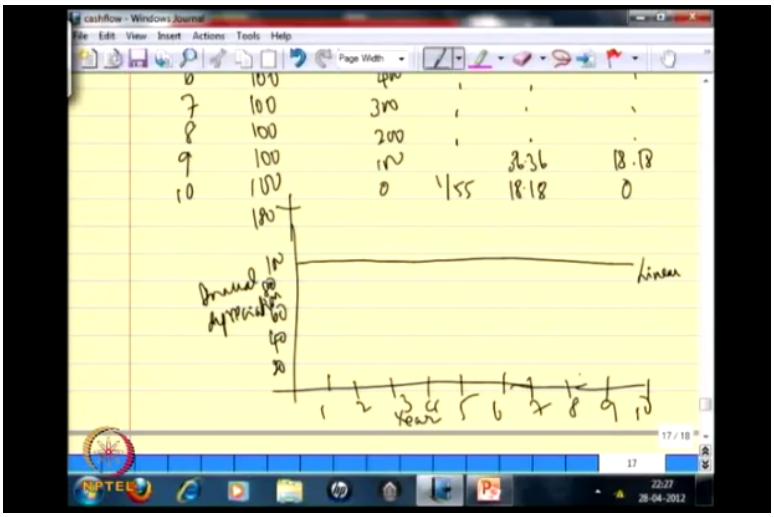

Between the year and the method that actually adopt calculate the annual depreciation. Now the annual depreciation if I use the linear method 20, 40, 60 80, 100 let say 180 here continuous to be 100. Suppose it is sum of the years digit 1, 2, 3, 4, 5, 6 now you would find that somewhere between.

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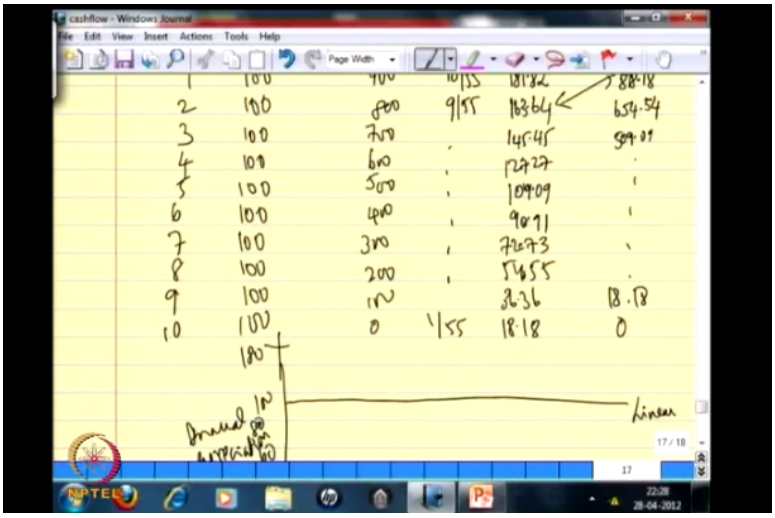

Suppose I fill all these details 127.27 here it is 109.09 then 90.91, 72.73, 54.55 you find that the between fifth and sixth year. That annual depreciation expense which was higher to the fifth year in the sum of your digit method it gets below 100 during the fifth year and sixth year period so, somewhere here.

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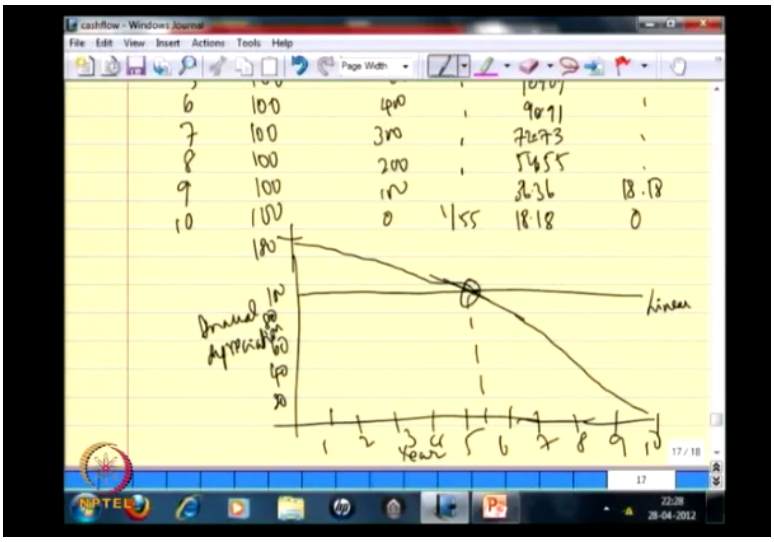

It crosses somewhere here wise is important it is important because from reporting point of view I am yet decide to get advantages of reduced taxable income. Because of an increased depreciation expense for the first 5 years, if you look at this the first 5 years, I have depreciation expense more than 100. Now here it two options that was available one annual depreciation expense of 100. In the other case the first 5 years the annual depreciation expense is more than 100.

And I decide to choose this why because I receive accelerated benefits of higher depreciation expense which reduces my taxable income. What will I do after 5 years, I switch over to straight lines method it is alone. Because remember when we discuss the principle of consistency though it says that you follow the same method that you are adopting. If at all you are making a change you just have to be reasonable in explaining why you are making this change.

In this case it is reasonable to say that 5 years I have followed some of your digits so, that I get the benefit of the reduced taxable income. I had of time and then after the sixth year whatever is the remaining depreciable amount. I depreciated over a straight line method and just I have to while I file my income statement and balance sheet. And I just have to explain that I am shifting my sum of your digit method to a straight method.

And then for the remaining 5 years you can continue to follow the straight line method of depreciation. So, these are the 3 special cases, that I thought you should be knowing, and of

course as I told you before there are other special cases. That can add more complexity to this subject but when I am going to dwell on those special cases. I am sure all of you, you will feel little comfortable when it comes to understanding an interpreting a financial statement.

And then you will know what has happened behind this screens that create this financial statement, and that is why you will begin to appreciate the entire concept of a accounting. The principles of accounting the principle of duality the debit, credit t accounts, journalised why did I do this, why was expenses recorded this way, why not this way, how sales is recognised, how cost of goods sold is being calculated.

So, all these conceptual understanding is what that I gave you in the last 14, 15 classes and with that conceptual understanding. You will be able to prepare a balance sheet an income statement and a casual statement. You will be able to identify relevant activities and measure those activities in monitory terms. And communicate in monitory terms by adopting a uniformly followed practice and in the process.

You would have created a balance sheet and income statement and a casual statement. Now, the exercised does not stop there, after you have created a balance sheet and income statement and cash flow. Now of course I told you why we do this financial accounting little difference from management accounting. Because the users of the information that comes out of financial accounting is not only those inside the organisation.

But all so those outside the organisation it could be your bankers, it could be your shareholders or who are they are so, that is one main reason why financial accounting gains importance. So, it is not just that you prepare this and then your job is over. After I prepare, what am I going to do to this financial statements can I understand.

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What these financial statements mean, I will be able to understand them add more sense to the financial statement. If I start analysing the statements by calculating certain set of ratios, and these ratios can explain whether my firm is liquid enough if I calculate the liquidity ratios. Whether there has been efficiency in terms of the activities the firms engaged I can calculate some ratios based on activity.

To understand the leverage or the capital structure of the firm by calculating the debt equity ratios to understand the profitability of the firm I have some profitability ratios. Now let us see how these ratios are important as a way to analyse these financial statements.

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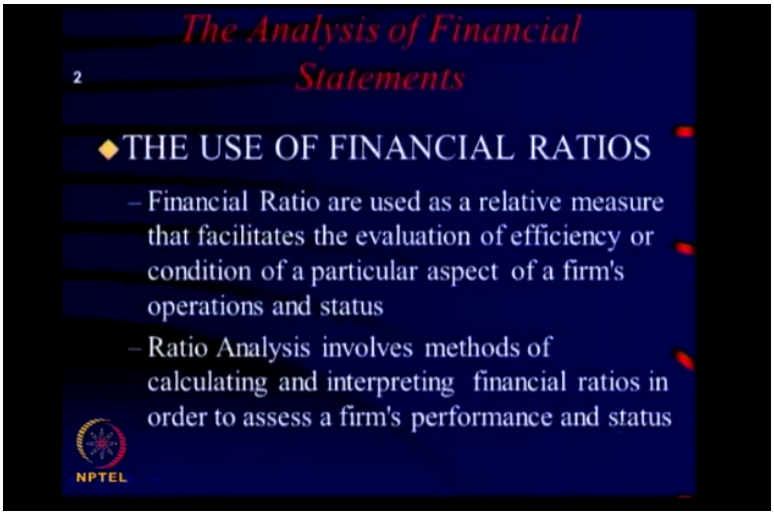

Now these ratios are important because looking at a financial statement looking at balance sheet and income statement. It just tells me that cashes this much inventory is this much, income is this

much and all that, now if am I able to relate all those entries these balance sheet figures, and income state figures. And try to see whether there is some relationship between these or I am able to calculate some ratios based on these entries.

I can make some fair judgement on the performance of the entity, and if I am able to do this for the previous year the year before that. Then I can also see how there has been progress in the firm, or if I am able to do this and compare this with my competitive firms ratio. Then I can know how I perform against competition so, it is this performance of an entity based on these ratios becomes very important when it comes to using these financial statements to analyse them.

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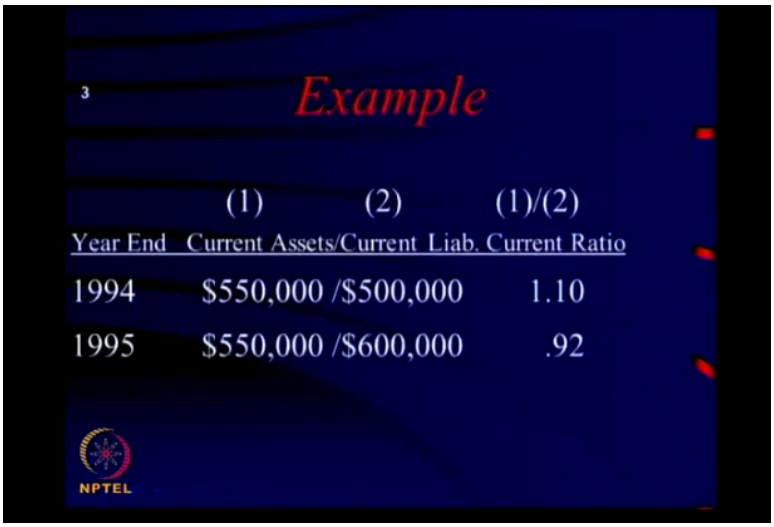

Suppose I want to compare one ratio with the previous year ratio let say current assets to current liabilities 1.1.92 so, previously it was 1.1 now it is 0.92 what is it mean. It means that last year I had more current assets as relative to current liabilities and this year. I do not have enough current assets to cover my current liabilities. I have done better looking at this ratio I can say, I am not done better, because I do not have enough current assets to cover my current liabilities.

Likewise I calculate different ratios why because as i told you it is not somebody inside the firm that interested in doing the analysis. Since this becomes a public document you are annual report has this income balance sheet anybody can do this ratio analysis. As a shareholder I will do this ratio analysis as an investor, as an banker as a member of the leadership team, as government as

anybody who can use this information who thinks this information is necessary can do this ratio analysis.

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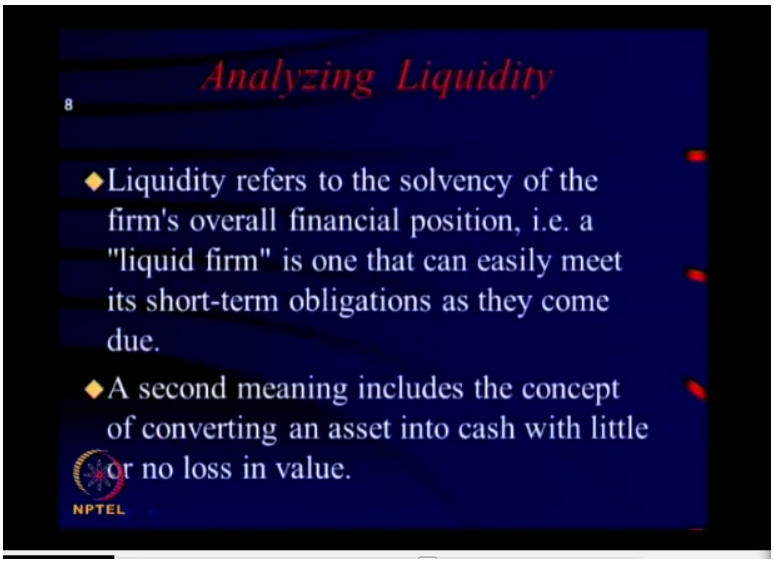

Now let us begin with the liquidity ratio liquidity means, how cash rich or cash poor the firm is it refers to the solvency of an entity. And it also it means that how quickly can assets be converted and realise to cash with very minimum or in fact no loss in the value of the asset. If an asset can be converted with no loss then it is most liquid form of asset the most liquid form of asset is cash by itself.

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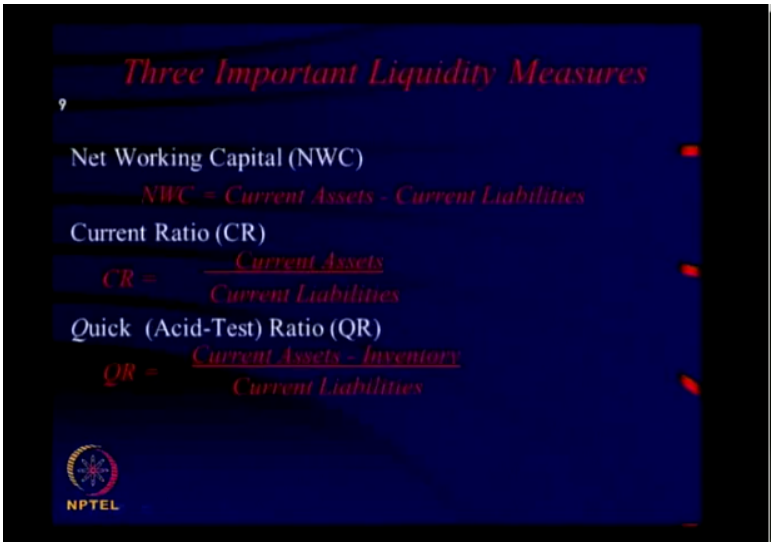

So, liquidity measures the solvency of the firm there are 2 ratios that actually explains the extent of liquidity of an entity, one is it is current ratio the other is the quick ratio. Current ratio is your

current assets by current liabilities, by the way current assets-current liabilities is in net working capital. I have not explain to the class what working capital is, because I do not think that the subject matter for this course.

I will be talking more about this in the next course, but it is enough for you do know that working capital is that financed that is required to meet your short term day to day requirements. And it is for purpose of, easy calculation assume to be net working capital assume to be current assets-current liabilities. Now current ratio is just current assets- current liabilities what is this mean it just tells you the firm is solvent enough or is not solvent enough to cover it is current liabilities.

If the ratio is more than 1, which means you have enough current assets to meet your current liabilities. If it had been 2.1 last year 1.3 this year. It means that from the solvency perspective I view that the extent of liquidity has reduced as against last year. Because, my current assets which could cover 2.2 times the current liabilities, now able to cover only 1.3 or 1.4 times the current liability.

But your current assets includes your cash or accounts receivable your inventories, and in the order of liquidity priority inventory is the one that probably takes more time to be converted into cash. So, I am not interested in actually having inventories as part of my current ratio, because it is very difficult to convert inventory without reduction in value. So, I want an knock off inventories, and then use an other ratio that can explain the same solvency from a different perspective.

So, if my current assets from a current assets, I remove inventory current assets-inventory divided by current liabilities that is called the quick ratio. Again this I s a liquidity measure but then removes inventories and tells you the extent of solvency. How much of current assets-the inventories that I have with me and how to what extent can it meet my current liabilities. So, this is the liquidity ratio.

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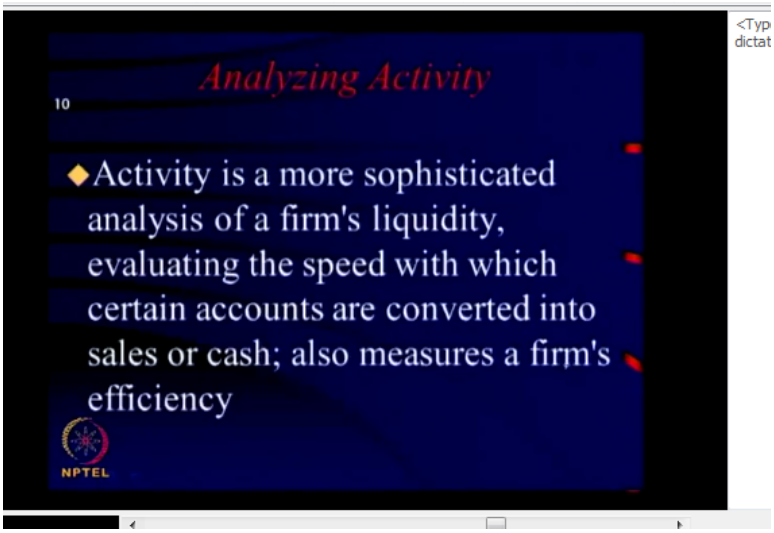

The next ratio is the activity ratio the activity ratio is what to do more with the efficiency with which assets are being used. And realised to generate saves and generate cash so, this actually measures the speed at which assets or converted or utilise to generates saves and generate cash.

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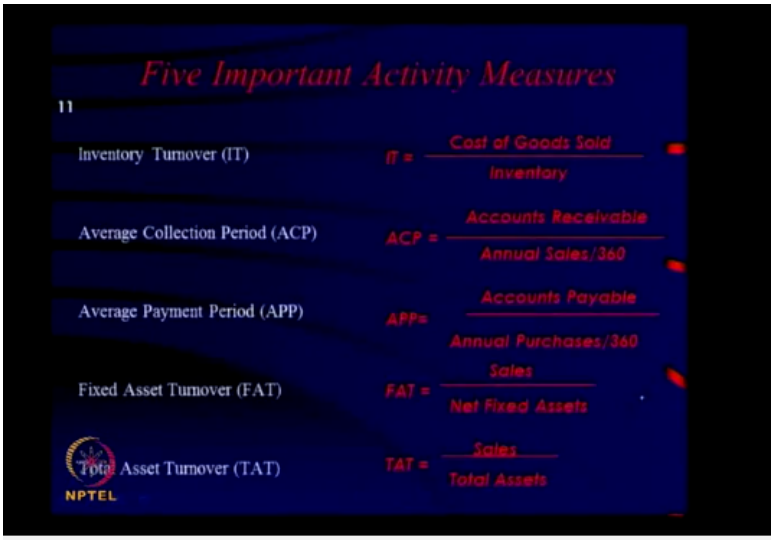

And what are these types of ratios, first is the inventory turnover ratio cost of goods sold/ inventory how quickly is your inventory being converted in to a saleable good. And other inventory I mean the activity ratio is your average collection period, average collection period explains the receivables management efficiency of the entity. Suppose in your balance sheet you have average I mean you have your accounts receivable say x.

That x/the total annual sales by 360 this annual sales by 360 sales per day, and your total accounts receivable/ sales per day tells you an average. You have to wait for certain number of days before you get the real cash for the sale that you make. Now how would that figure, you would wanted to be the longer is your collection period. It means that your poor in your receivables management as much as possible.

We need to have shorter collection periods strictly speaking that is why if you go to restaurant business. It is hot cash you eat something you pay immediately, that is no collection period as against manufacturing entity, where you allow credit 30 days, 60 days credit. So, the act the collection period the longer or shorter explains how your receivables management as an activity is a efficient the longer it is, it is not that efficient.

The shorter it is, it means that you have a better receivables management policy in place, opposite to that is your payment period which is got to do with your vendors. The total accounts payable/the annual purchases or you could also use cost of goods sold in strict the average purchases you make every day. And your total accounts payable, if you use these two numbers you have a ratio expressed in days. You have a number expressed in days.

This tells you that let say if this is 20, it means for a every dollar, every rupee that you purchase. You take 20 days to pay your vendor for that and within allowable principles, if you are able to extent this 20 to 25 days, 30 days. Then it is good to the firm because you are elongating the cash out flow. And this is opposite to the view that you take for receivables the more and more you are able to stretch your payment period the more and more.

You have internal cash accruals can be deployed for other activities, sales by net fix asset tells you how quickly your asset is being utilised. This is an asset turnover ratio, how quickly you are able to utilise your asset to calculate sales. So, every 1 rupee of asset is generating some sales the efficiency is with which assets are being utilise generate sales can be calculated using your fixed asset turnover ratio. If you include all the assets both you are fixed and current assets.

This just the total turnover but both of them in principle conveys this same meaning the extent to which assets are being protectively used to generate sales. So, this measures the activity of the firm.

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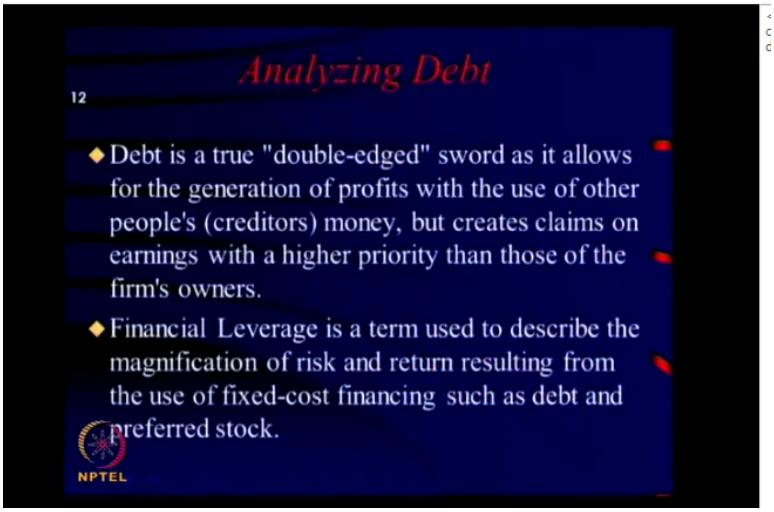

All these activity ratio the next ratio have not spend a lot of time on this, but this we will be spending a lot of time in when we actually do finance for the engineers is to analyse the use of debt. Now debt measures the extent of financial leverage, every firm phrases capital through different sources. The two most popular sources will be debt and equity and based on the characteristic of the firm the characteristic of the industry.

You will find different firms in different industries having different debt equity ratios. So, you can never say that a debt equity ratio 40 percent is the best. It could be best for a given context you can never say that this is the right debt equity ratio because, it changes from industry across companies.

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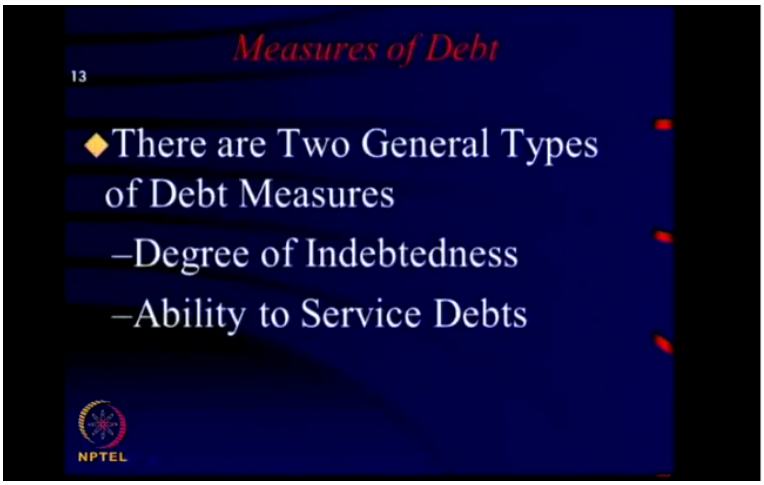

Now two things that we would be interested in measuring took see the debt ratio is first, the extent of leverage of the firm. How much of debt it means to be it is needs to pay, and whether the degree of Indebtedness. Whether it is high or low considering the circumstances the firm is operating. The second thing is, whether the firm is ability is the firms ability to meet it is debt obligations. Whether it is able to service it is debts.

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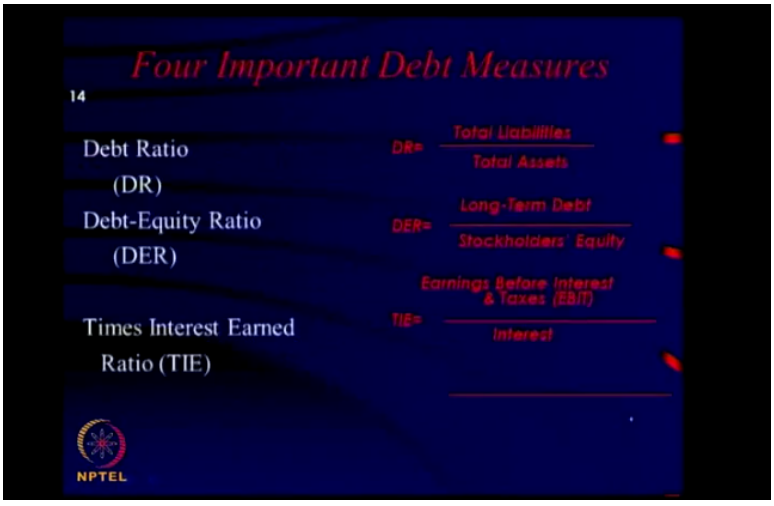

These I can calculate I can make an assertions by calculating these ratios first thing is a simple debt ratio of the total assets, that you have created total liabilities/total assets tells you the debt ratio of the total assets that you have created. How much as comes from the liabilities debt equity ratio is out of the total capital that you have from which you have created this assets. How much is the debt component.

How much is the equity component 60 percent debt 40 percent equity 20 percent debt 80 percent equity this we will use, when we actually calculate the optimum capital structure of a firm. When will you say that a firm is not optimally leverage, either it could be under lever, or over lever. Now this ratio we will use to find the optimum capital structure of a firm which tells you whether there is a right amount the right mixed of debt and equity that this firm is being utilised.

As a result of which the value of the firm is maximised. This ratio becomes important from that perspective times interest earned ratio is your earning before interest and taxes. What is the earning is that you have before an interest and taxes divide that by your interest. It tells you the propensity of the firm to meet it is current debt obligations, whether it will be able to meet at least it is interest obligations.

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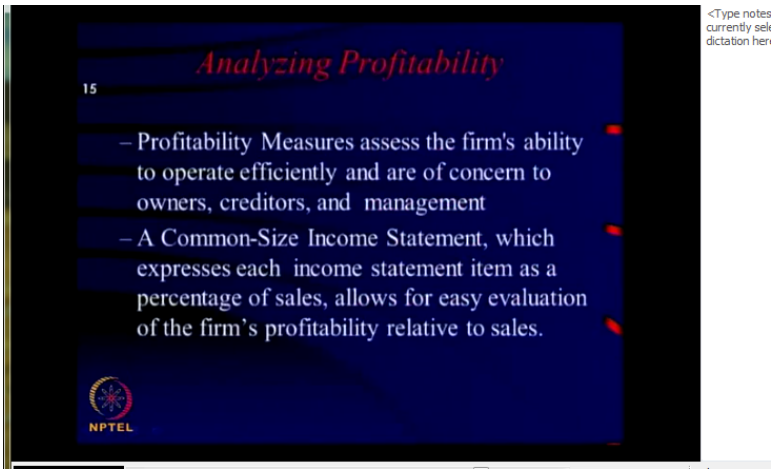

So, this is a set off debt measures the ratio is that used to calculate the debt profile, the leverage the financial leverage of an entity. The next important ratio is the profitability ratio at the end of the day everybody needs to know the net income that the firm is making.

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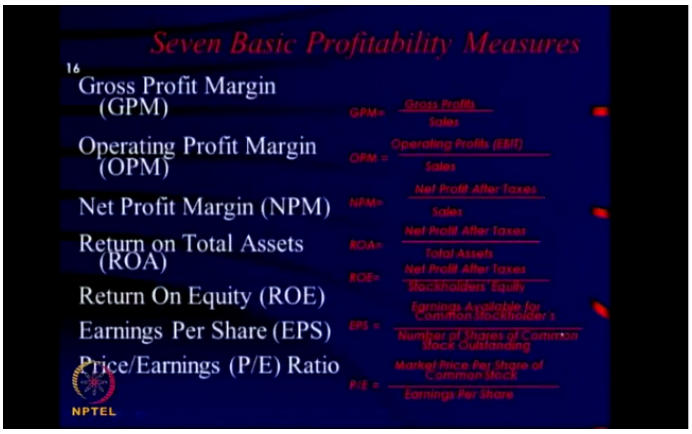

The profitability ratios goes profit by sales your gross margin by sales, gives you the gross profit margin. Again when we saw the income statement I told you what your operating margin is your operating profits are in this case earning is the for interest and tax/sales gives you the operating profit margin. The net profit margin is your net income/sales thus the profitability measure net income/sales.

Suppose I want to measure the return on assets for every dollar or every rupee of asset how much is the return I generate. Then it just your net sales I mean net income/total assets as a shareholder I want to know the return on equity it is just all the earnings that is available to the firm. That needs to be disposed to shareholders/the number of I mean the value of the total share holders equity so, that gives you the return on equity.

So, the net income after taxes, which is actually entirely shareholders/total value of the share holders equity is the return on equity. The earnings per share again the net income that needs to be distributed to shareholder/total number of shares outstanding in the firm. The P/E ratio is the price to earnings ratio is the market price of the common stocks that trading market price/the earnings per share that is the P/E ratio. So, these are all your profitability ratios.

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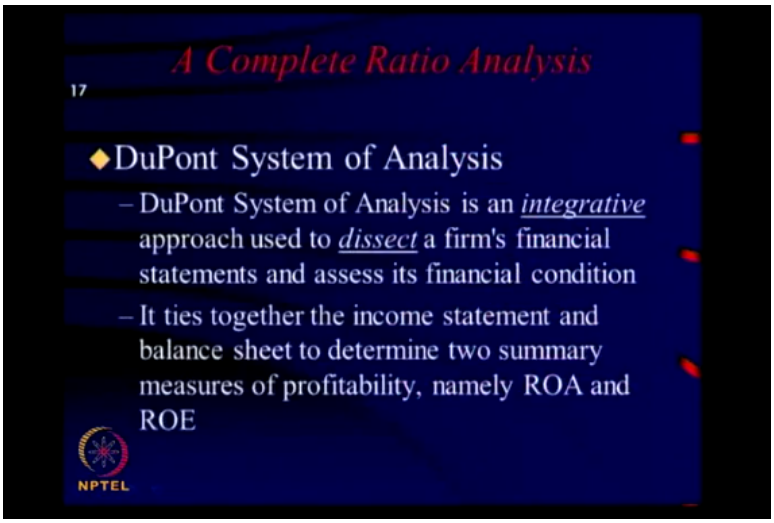

And other important ratio that you need to know is called the Dupont ratio which is more integrative. And you will understand why I am saying this word integrative because it just dissects the financial performance into 3 identifiable ratios. Each of them important in their own way and then integrates all these 3 to arrive at a final ratio.

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Now you see that the return on equity is a very, very important profitability ratio. Because the understanding is that the purpose of any firm is to maximise shareholders value. And one indicator that tells you yes shareholder value getting maximises the return on equity. Now back return on equity as I told you before it is the net income/the total equity value. That can be divided into 3 parts one that explains the net profit margin.

In this case it is net income/sales, and then and other important measure is how efficiency assets are being used to generate the sales. And that you can measure by calculating the sales/the assets, because that gives you the efficiency of the use of asset and that is called asset turnover. And other thing is the extent of leverage, and that you can measure by having a look at the total assets you have created. How much has been because of equities.

So, asset by equity that measures the extent of financial leverage now how these three looked at individually are very important ratios. One net income by sales is a profitability ratio sales by asset is a productivity activity ratio tells you about asset turnover asset by the equity is a leverage ratio. It tells you the extent of which debt and equity is the used, and each of them on their own are important ratios and all of them combined will explain the return on equity.

So, if you are able to break the return on equity into 3 parts and see the contribution of each of these ratios to the return on equity. You will be able to understand this concept a little better because then you will be able to know whether profitability can be improve the asset turnover can be improved or the probably can change the capital structure. So, that the return on equity also improves which is dissecting the return on equity into these 3 important ratios.

Not that these 3 are the only important ratios because all these 3 put together also forms return on equity which is also a very, very important integrator. That speaks about shareholder value creation so, Dupont ratios splits return on equity into these 3 parts to make an individual analysis integrating them to calculate the return on equity. So, what we have done during these classes is to understand financial accounting from the perspective of identifying activities within a firm.

That makes monitory sense and recording them in by following a set of principles that uniformly accepted. And, then communicating that information by way of creating an income statement, balance sheet and cash flow, and using these statements we are able to make a judgement we are able to make an analysis of the performance of the company. So, this is an actual in a single sentence what we have done in the last 14, 15 classes.

And I am sure you will now begin to appreciate the financial statements that you see I am sure you will be able to identify activities within the firm. And monetise them, record them based on accepted principles. I mean you do all of these meticulously correctly you will definitely to able to create your own the firms, balance sheet, income statement and cash flow statement. So, next class we will be talked about little bit about management accounting.

Because accounting yesterday I will be dealing with financial and management accounting in the next class we will be spending little time on management accounting after which I will be concluding the chapters and accounting. And then we will shift into strategy and economics Thank you.