Depreciation, Alternate Investment and Profitability Analysis.
Professor Dr. Bikash Mohanty.
Department of Chemical Engineering.
Indian Institute of Technology, Roorkee.
Lecture-17.
Profitability Analysis – Net Return.

Welcome to the course Depreciation, Alternate Investment and Profitability Analysis, we are continuing with the module three that is profitability analysis. Today in the lecture we will deal or we will discuss another profitability methods that is net return. Net return method is another profitability measure which does not use time value of money. It measures the extra amount of cash flow that is required to meet the minimum acceptable rate of return on the investment as well as to recover the total capital investment that has incurred.

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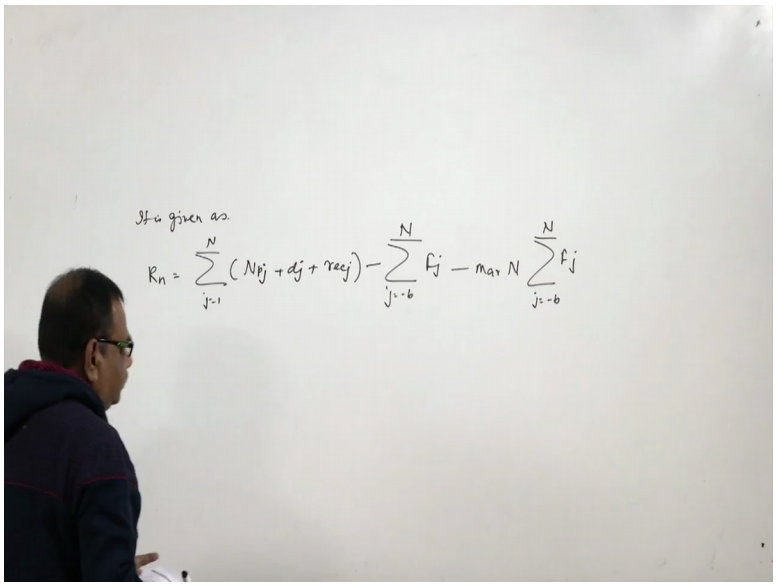


It is given as:

$$R_n = \sum_{j=1}^{N}\left(N_{p,j} + d_j + rec_j\right) - \sum_{j=-b}^{N} F_j - m_{ar} N \sum_{j=-b}^{N} F_j \qquad \text{...Eq.1}$$

Where; d_j - is the depreciation in j^{th} year,

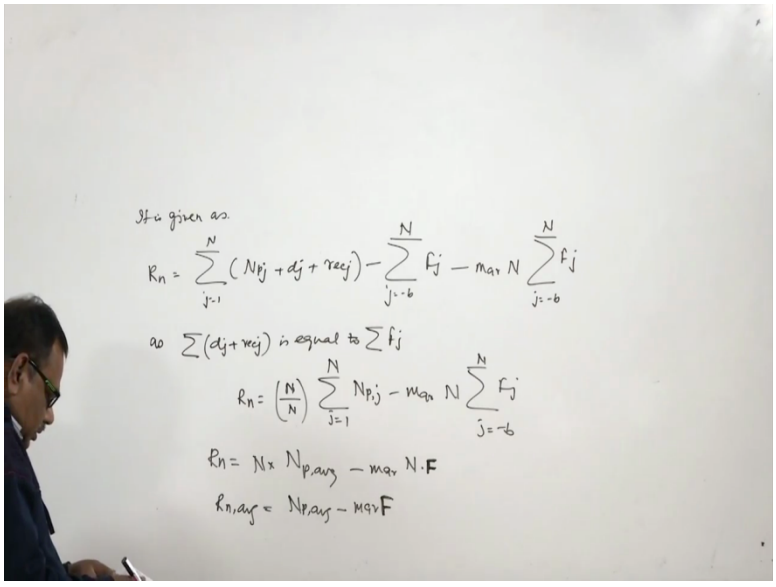
rec_j - is the money recovered from the working capital and the sales of physical asset(equipment, building, land, etc.)in the year j and

$N_{p,j}$ -is the net profit in the j^{th} year

F_j -is the total capital investment done in j^{th} year (Fixed +working)

m_{ar} - minimum acceptable rate of return per year

N is the evaluation period.



$$R_n = N * N_{p,avg} - m_{ar} N * F$$

Or

$$R_{n,avg} = N_{p,avg} - m_{ar} F$$

The right hand side of the Eq.1 and its derivative equations are equal to the total cash flow minus the amount of money required to pay the capital investment per year along with the earnings that are expected from capital investment based on minimum acceptable rate of return per year.

This is computed by subtracting amount earned on investment based on minimum acceptable rate of return + the actual total capital investment from total cash flow. All these amounts are in fact cash flows obtained over the evaluation period. Let us take how to compute this net return, it is given by given as Rn is equal to summation J equal to 1 to N Npj+dj+recj - summation Fj j equal to –b to N –Mar N j equal to –b to N Fj. Where dj is the depreciation in jth year, recj is the money recovered from the working capital and the sales of physical asset that is equipment, building, land, etc. in the year j.

Npj is the net profit in the jth year, when I say net profit tax paid. Fj is the total capital investment done in jth year this is Fixed+working capital, mar is the minimum acceptable rate of return per year and N is the evaluation period. Here we will see that this starts from –b where this starts from j equal to 1. Basically if we see that if this is a period t equal to 0 the form starts producing before that we have to invest.

That means the investment will starts from here and the production starts from here and that is why this is –b because these are the fixed investments, it starts before the production starts. Further process this, we can write down as summation dj+recj is equal to summation Fj, the equation reduces to Rn N by N summation j equal to 1 to N Npj - mar N j equal to –b to N Fj.

Or we can write down Rn is equal to N into N p average – mar N into F, capital F, capital F is the summation of this Fj. Now this N is this and 1 by N into this is Np average. Or you can write down Rn average is equal to Np average –mar into F this is capital F bold F. If I take N common and divide it this Rn divided by N becomes Rn average so this is my formula. Now the right hand side of this equation, this is right hand side of this equation, is derived, these derivedequations are equal to the total cash flow - the amount of money required to pay capital investment per year along with the earnings that are expected from capital investment based on minimum acceptable rate of return.

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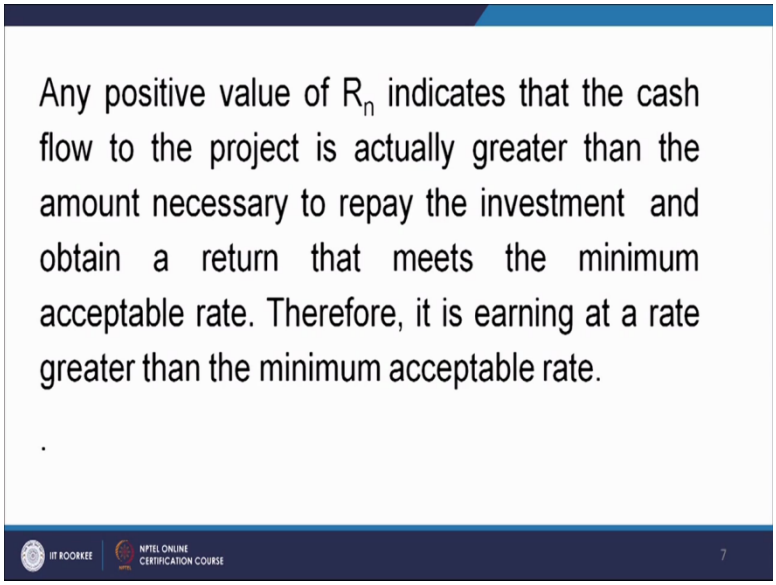

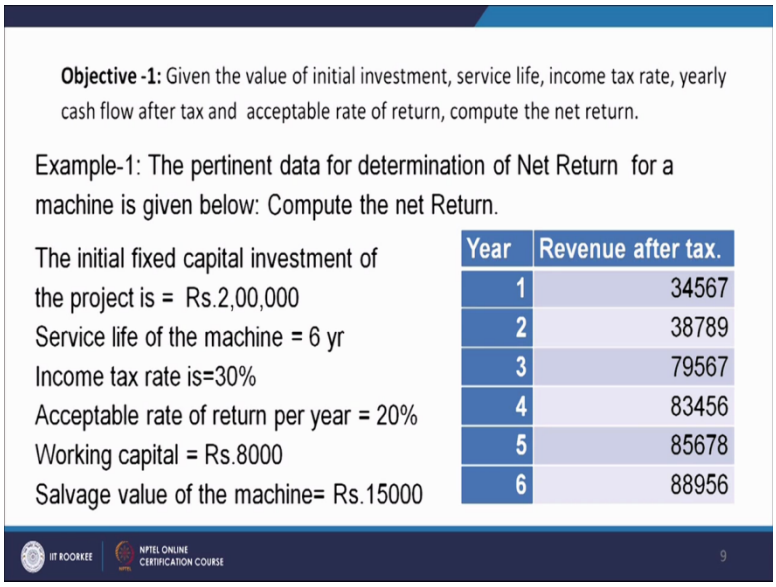

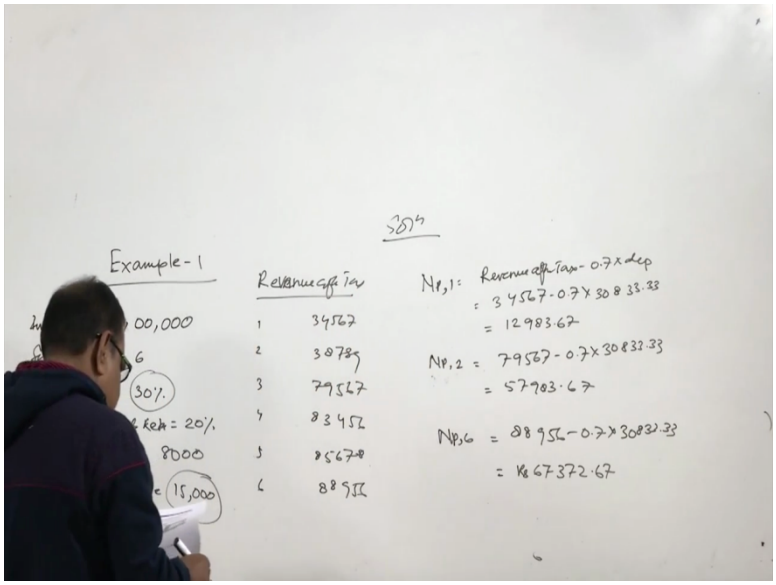

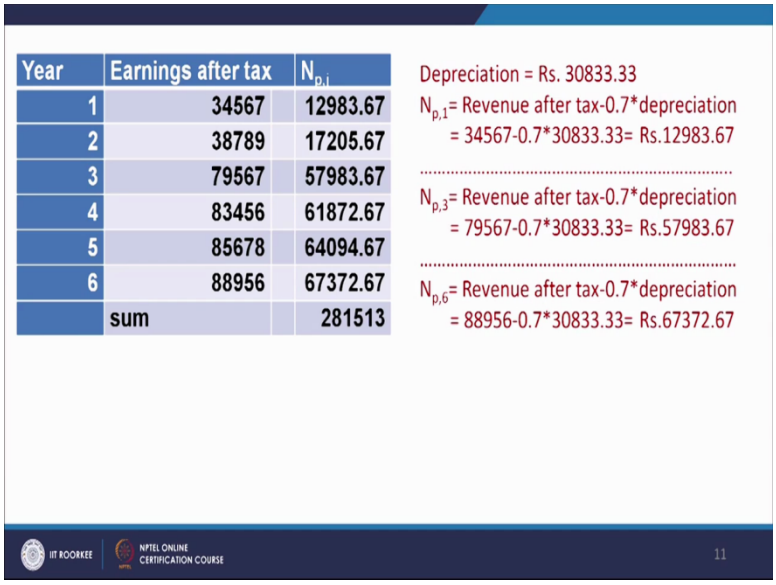

Now having derived this equation let us go for some numericals where will apply this equations to arrive at some conclusions. Any positive value of Rn indicates that the cash flow to the project is actually greater than the amount necessary to repay the investment and obtain a return that meets the minimum acceptable rate. Therefore, it is earning at a rate greater than the minimum acceptable rate which is mar.

If Rn happens to equal to zero, then the project is repaying the investment and matching the required mar. Either this indicate a favourable rating for the project. However, a negative value of Rn indicates that the project obtained obtains a return that is less than the mar, and therefore, the project should be unfavourably rated.

Now let us take an example the objective of this example is given the value of initial investment, service life, income tax rate, yearly cash flow after tax and acceptable rate of return, compute the net return. Example is, the pertinent data for determination of Net Return for a machine is given below, compute the net return. So example 1 the original fixed capital investment of the project is rupees 200000.

Service life is 6 years, income tax 30 percent, acceptable rate of return is 20 percent, working capital is equal to 8000, salvage value is equal to 15000, these are the conditions. And revenue after tax 1, 2, 3, 4, 5, 6, 34567, 38789, 79567, 83456, 85678, 88956. Now the solution, Rn average is equal to Np average – mar into F. Rn is equal to Rn average into service life.

Np average is equal to Np,j divided by service life, Np,j is equal to the after tax earnings not including depreciation . Now Np,j is equal to revenue 1 - tax - cash expenses which are 0 in

this case + depreciation into 1 - tax. So Np,j is equal to revenue that is after tax, revenue after tax, when I multiply revenue into 1 - tax, this is revenue after tax –1 - tax depreciation.

So this is revenue after tax now the tax percent is 30. So 1 - 30 is 0.7, so this is 0.7 depreciation. So this is my formula. Now depreciation is in this case, is 200000 - this is the salvage value 15000 divided by 6 comes out to be rupees 30833.33 so if I calculate Np,1 for the first year this is revenue after tax - 0.7 into depreciation. Now this is revenue after tax is given, this is 34567 - 0.7 into 30833.33 is comes out to 12983.67.

Similarly Np,2 it will be 79567 - 0.7 into 30833.33 this comes out to 57983.67 and if I calculate Np,6 this one this is 88956 - 0.7 into 30833.33, this comes out to be rupees 67372.67. Now these computations are here. Now I can calculate all Nps and then I can sum it, so summation of Np,j, the summation of Np,j comes out to be 281513, when this summation is known, I can calculate the Np, the average value.

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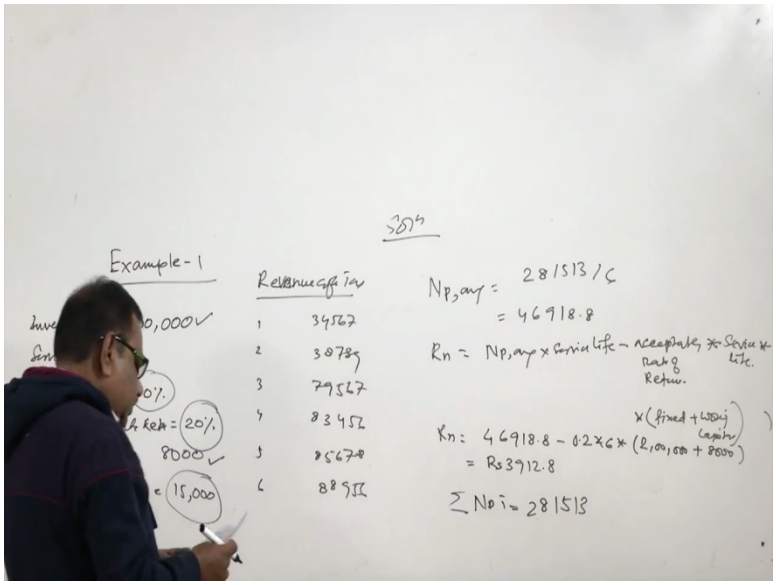

Np,average is equal to 281513 divided by 6 comes out to be 46918.8. Now Rn is equal to Np,average into service life - acceptable rate of return into service life into this into in bracket fixed + working capital. Now Rn is equal to 46918.8 - 0.2 this is acceptable rate of return is 20 percent that is 0.2 into m into 200000 + working capital is 8000. The investment is 200000 here and the working capital is 8000, there I have given. And this calculates out to be rupees 31912.8. Now as the value is positive it says that as the value is positive I am able to get by acceptable rate of return or more than that acceptable rate of return and hence this would be accepted.

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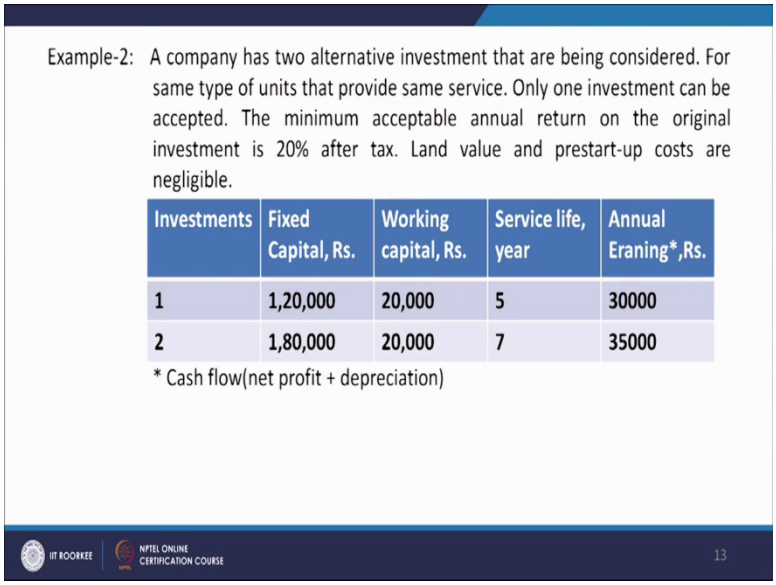

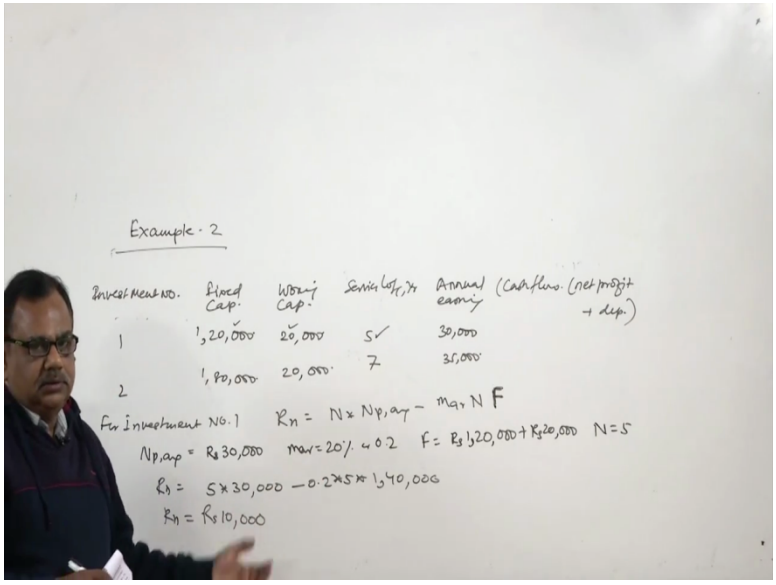

Now let us take another example which is example 2, this shows that a company has two alternative investments that are being considered for same type of units that provide same service. Only one investment can be accepted. The minimum acceptable rate of return on the original investment is 20 percent after tax. Land value and prestart-up costs are negligible. So I have the example 2 this is investment number this is 1, 2. Fixed capital this is 120000, this is 180000. Working capital this is 20000, this is 20000. Service life this is 5 years, this is 7 years. Annual earning this is 30000, and 35000.

Now this annual earning is basically a cash flow which is net profit + depreciation. This cash flow is net profit + depreciation. So if you compute for investment number 1, my formula is Rn is equal to N into Np,average - mar N into F capital. Now what is given Np average is

equal to rupees 30000, mar is equal to 20 percent or 0.2, F is equal to rupees 120000 + rupees 20000 which is the working capital.

So this is taken and this is taken there. And N is equal to 5 years from here. Now Rn is equal to 5 into 30000 - 0.2 into 5 into 140000. So this comes out to be Rn is equal to rupees 10000. Now since Rn is positive the investment is acceptable as it will be in a position to meet this mar 20 percent and infact it will give a value which is more than 20 percent return.

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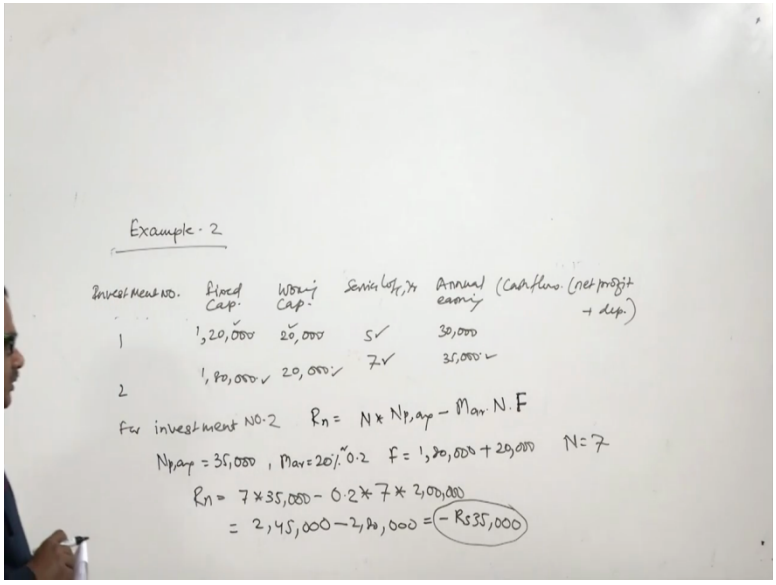

Now if I go for the investment number 2 for the investment number 2 again same formula Rn is equal to N into Np,average - mar into N into F. So my Np,average is equal to 35 35000, mar is equal to 20 percent or 0.2, F is equal to 180000 + 20000 here I have taken 180000 from here I have taken. And N is equal to 7 years it is taken from here. Now if you calculate Rn, 7 into 35000 - the value of mar is 0.2 into 7 years and this is 200000 has come from here 1 point 180000+20000 is 200000.

This comes out to be 245000 - 280000 this comes to be –rupees 35000. This quantity is - you see that this quantity is - that means it is not in a position to pay the minimum return of 20 percent. Since the value of Rn is negative the investment is unacceptable to us. Now to summarize in this lecture we demonstrated how to use net return as a profitability measure to select a investment amongst a number of mutually exclusive investment.

We saw that if the net return is negative then the investment is not able to get the minimum rate of return here in this case in the last example it was 20 percent. And if it is positive then it is able to get more than the minimum rate of return that is mar, m suffix ar. And if it is even

zero, then also it is able to get the mar. So if it is zero or positive then this is acceptable proposal is acceptable and if it is negative proposal is not acceptable and we have to reject it, thank you.