Security Analysis and Portfolio Management

Prof. J. Mahakud

Department of Humanities and Social Sciences

Indian Institute of Technology, Kharagpur

Lecture No. # 39

Portfolio Performance Evaluation -1

We have to discussing about the different types of the portfolio, and different type of the financial instruments which are used to construct the portfolio. Now, we should know that whatever portfolio we are constructing, how those portfolios are performing or is there any kind of scope to make better to get the return from that particular portfolio, or whatever objective we have fixed before the same objective can be fulfilled whenever we taken of or we have constructed that portfolio. So, to know that, we should know that how this portfolio is performing. So, in this context, we have to derive certain methods through which the portfolio performance evaluation can be made.

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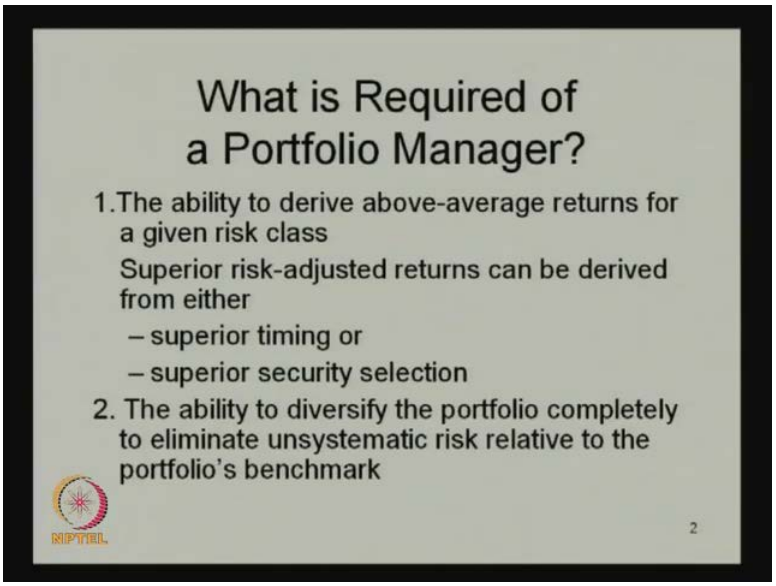

So, if you see that, whenever we talk about a portfolio manager, what exactly the portfolio manager wants. Always the portfolio managers wants or he should have the ability to derive the above average returns for a given risk class. That means, whenever

we talk about the above average return, maybe we can always refer to a benchmark index or the benchmark portfolio, and always if this investor is taking active position in the market. He should always outperform this particular benchmark index, and he should get more return for this particular market index of the benchmark index is giving.

So therefore, the superior risk adjusted returns can be derived, how it we can derive this either we can go for a superior timing - timing in the sense we are referring to the market timing, if the timing is good. So, whatever construction of the portfolio, you have made or whatever way you have invested in the market, but because of the good condition in the market, because of the good timing in the market, may be the return will be more.

But if, in a normal condition the investor is operating or the portfolio manager is operating, then, it is a little bit difficult to get this abnormal return or above average return very easily. So, therefore, you have to use your skill or you have to use your capacity to enhance this particular return from the market. So, therefore, we should have a superior security selection. That means, we should know which are the securities should be included in the portfolio which are should not, and accordingly we can say that whatever return, we can get that is more than the above average return.

And another objective or the requirement of a portfolio manager, what the portfolio manager should have. They should have the ability to diversify the portfolio completely to eliminate the unsystematic risk related to the portfolios benchmark. That means, whatever risk - unsystematic risk this particular investor is facing or the particular portfolio is facing, already we know what do you mean by this unsystematic risk. It is basically the specific to the stocks, specific to the company, and it is basically not uniquely same for all the companies which are operating in the market. So, from company to company this particular unsystematic risk varies.

So, in this context we should also see the diversification should takes place in such a way, that the unsystematic risk of that portfolio should be equal to zero. That means, we can diversify the total unsystematic risk or the individual company specific risk. What this particular investors are facing due to this different behavior of the stock prices, at the different time period.

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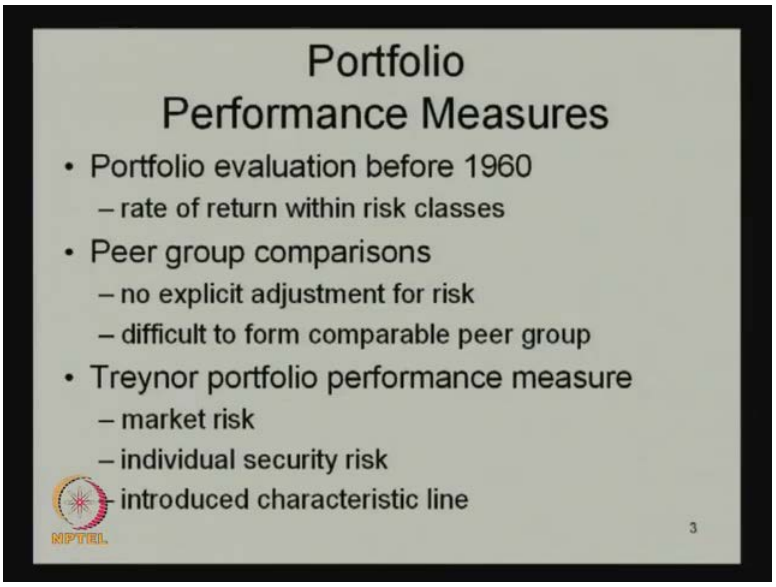

Then coming back to the portfolio performance measures, which are the different portfolio performance measures; historically if you observe that we have before 1960's; Always we are comparing between the return and risk, and always this return and risk the trade off can be made within this risk classes. That means, we categorize this investor on the basis of their risk preference, and as well as we categorize the different stocks or different portfolios on the basis of their risk involved. And then we compare between the risk and return, and let the risk is 10 percent and the return is 12 percent. Then we can say this stock is performing better or we can say that if a risk is 10 percent, return is 8 percent, then the stock is not performing better with respect to that particular risk level.

So, this was happening before 1960.So, gradually after that what has happened that they have compared it with the peer peer groups. For example, one particular company is operating in a particular industry, let manufacturing industry or the services industry. So, how this peer group is performing in that particular time or the peer company is performing in that particular time, by looking into that performance of the peer group. We can say, whether my stock or my portfolio is performing better or it is not performing in that way, whatever way this particular other stock in my peer group is performing.

So therefore, what I can say here, that the comparison between the peer group company, in terms of their behavior, in terms of their return which this company - what we are

taking into account. Generally decides whether this stock is performing good or not. So, here there was no explicit adjustment for the risk, and difficult to form a comparable peer group.

So, therefore, there are two things we have seen here - that here we have not taken the risk accept accept into our consideration. The risk aspect here it is very important, because whenever we take the position in the market, we do investment in the market, always we always see that how much risk I am going to bear. If I will take the position in this particular portfolio or this particular stock in a particular time.

But here, if I only is looking into my comparative analysis between my peer group, what my peer group is doing, and I should go ahead with that or my peer groups performance should be my benchmark. If I am getting with my peer group, then I am reasonably doing well. If I am getting more than the peer groups return or peer groups other characteristics of the company. Then we can say that, I am not I am I am doing very well in this particular market in that particular time.

So, here we have not taken into account either the risk profile of this particular companies or risk aspect is not been taken into consideration, and second one is finding out a very very typical peer group company is a little bit practically difficult. So, therefore, it has some criticisms. So, it has some kind of limitations, whenever we talk about the comparison between the peer groups, and accordingly with say that whether the stock is performing better or not or the portfolio is performing better or not.

So, gradually what has happened, that the other measures have been developed. Then one of the very popular measure is neither Treynor portfolio performance measure. So, what the Treynor has use this three things or three particular concepts, while measuring this portfolio performance, because he has taken market risk into the consideration, individual security risk, and the introduced characteristics line.

So, the already you know, what do you mean by the characteristics line. And Treynor has use this three concepts, and three type of is concepts in the particular finance literature. And then, he was trying to find out that how this particular stock is performing in a particular portfolio is performing, in a particular time period.

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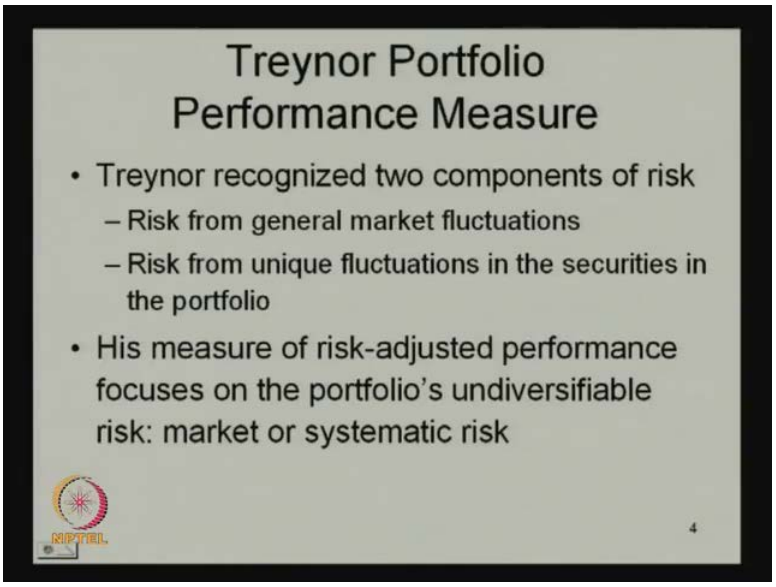

So, what basically Treynor was trying to say - Treynor was trying to say that there are two types of risk, then the two components of the risk always this investor or the portfolio manager faces. The one risk is risk from the general market fluctuation what we call as the market risk, and the risk from unique fluctuation in the securities in the portfolio that we call it a unsystematic risk. So, what he said, that he is measure of risk adjusted performance focuses on the portfolio's undiversifiable risk - that is a market risk or systematic risk.

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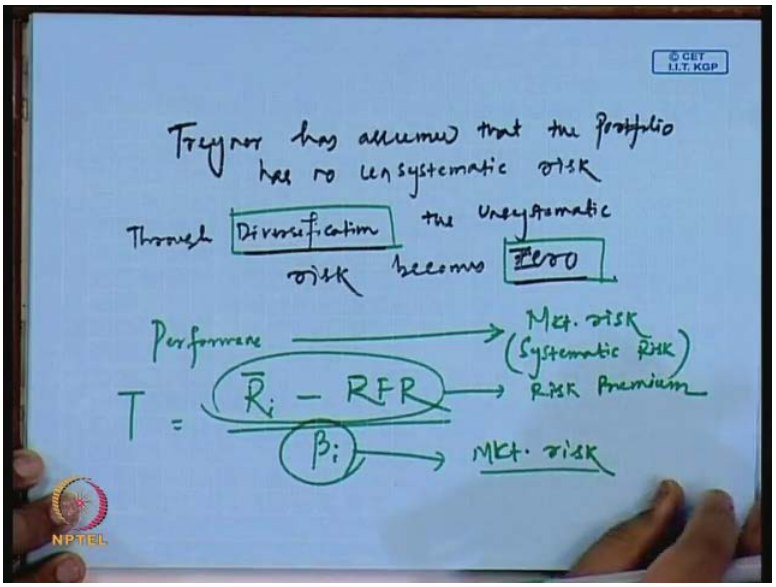

What does it mean, it is because that the Treynor has assumed, the Treynor has assumed that the portfolio assume that, the portfolio has no the portfolio has no unsystematic risk. Why he said that the portfolio has no unsystematic risk, because through diversification through diversification the,, you remember the through diversification the unsystematic risk became zero, unsystematic risk becomes zero.

So, why here what we are trying to say, you remember the two things this diversification and zero. That means, there is no such kind of unsystematic risk is involved. So, therefore, the performance the performance should be measured or should be adjusted towards the market risk or we can say this systematic risk. So, this is what the Treynor measure was trying to say. So, then what you says that, how he has measured it - he has measured it in this way, that let you denote a T or the Treynor measure, your if you take this average return for the portfolio over a period of time minus your RFR; RFR represent the risk free rate, and this is your beta which is the representation of the market risk.

So, therefore, the numerator this is already you know that, this is the risk premium, this is the risk premium and already you know that this is your measures of the market risk. And particularly this expression is talking about the risk premium return per unit of risk. How much risk premium return you are getting per unit of the risk at a particular time, that is what the Treynor was trying to say.

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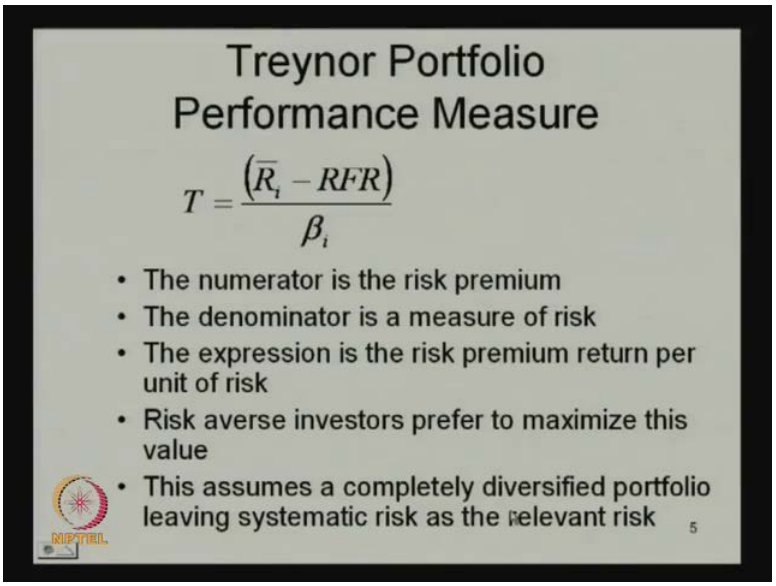

But then the question will araise, even if I am using this measure that how I can say that if you use this measure also, how we can say that this particular measure. If you get 5 percent, 6 percent, 7 percent whatever it may be. But whether this is a good return or good performance or not how we are going to conclude. So, because of that what the Treynor has taken, that he has taken certain other other assumptions, that the risk averse investors prefer to maximize the value. And this assumes a completely diversified portfolio, leaving the systematic risk that the relevant risk what already I have told you.

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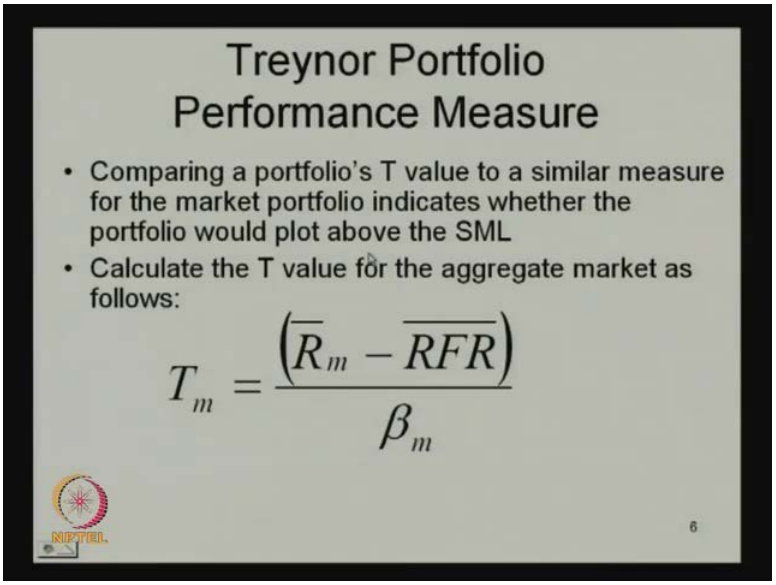

So, here what he said that to know that whether my portfolio is performing better, you compare the portfolio's T value to a similar measure for the market portfolio. Then, we can say whether the portfolio would plot above the security market line or not. If it plots above the security market line, then we can say that a it is giving some supernormal return unless it is not.

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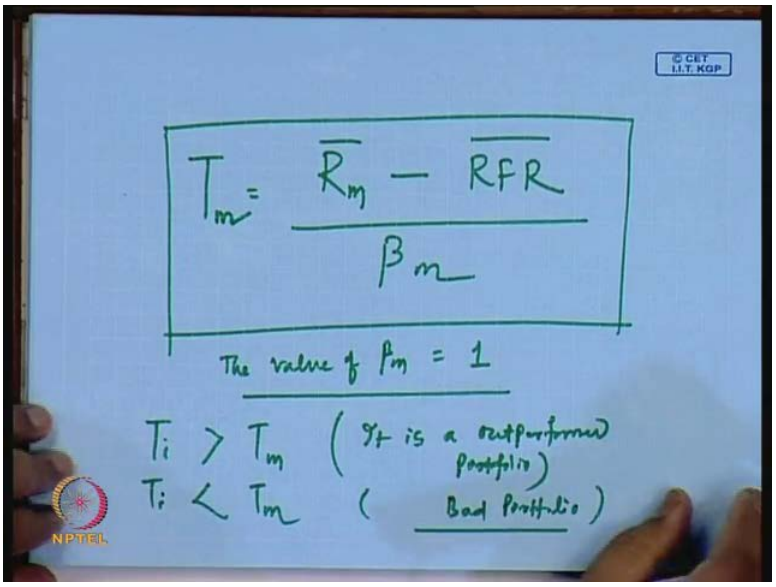

So, then what this Treynor has said, you calculate the T value of the market portfolio also. Then this is again the average return for the market, then your average return from the of the risk free rate divided by the beta m. What is the value of the beta m? Basically always the value of the value of beta m is equal to 1, value of beta m is equal to 1. So, you compare this T m basically - the T m with this T i this T here, we can write this is T i, you compare this T m with this T i. Then you can say if your T i is more than T m, then we can say it is it is giving, it is a outperformed portfolio it is a outperform portfolio. But if T i is less than T m, then we can say it is a bad portfolio, because it is not, it is giving the less performance what this particular market portfolio or the benchmark portfolio is giving.

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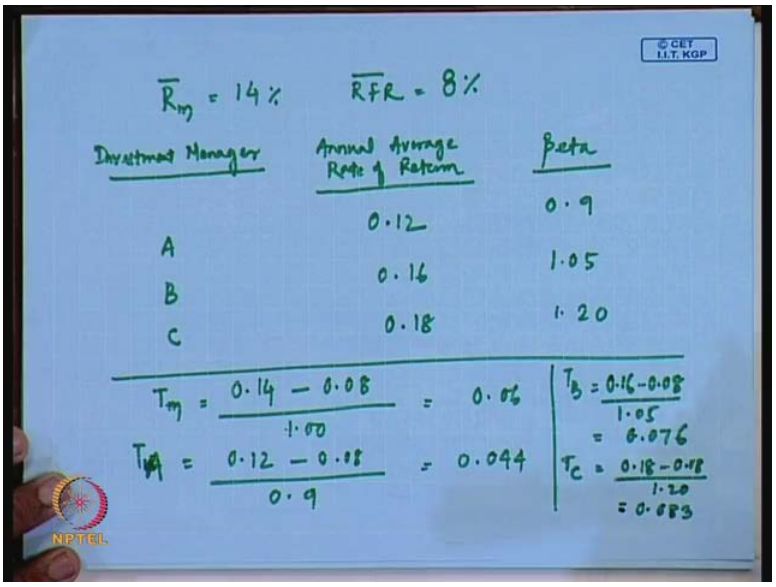

So, you take this example let we have a your R m average return is 14 percent, then your average RFR is basically let 8 percent, then another data I will be given to you. Let these are the different investment manager, investment manager - these are the investment manager, this is the annual average rate of return what they are getting, rate of return from the portfolio; this is the beta of the portfolio. Let your A B C - A is giving let 0.12, percent B is giving let taking getting 0.16 percent, and let C is getting 0.18 percent, beta is here 0.9, here it is 1.05, here is 1.20.

If this is the case then what we should do according to Treynor that, you have to measure first T m - T m is equal to 0.14 minus rate, the risk free rate it is 0.08 divided by the beta already I told you that beta is always 1.1 for the market portfolio, then it will be 0.06. That means 6 percent, but again here it is if you talk about to T A which gives you 0.12 minus 0.08 by 0.9, which will give you 0.044.

So, here we have seen that it is giving less return than this particular market. Then gradually what you can say that like that, you can say this is your T B which is basically 0.16 minus 0.08 divided by 1.05 that will give you 0.076. Then here, T C which is nothing but 0.18 minus 0.08 by 1.20 that will give you 0.083. So, now what we have seen that the except T A, these two are the above S M L.

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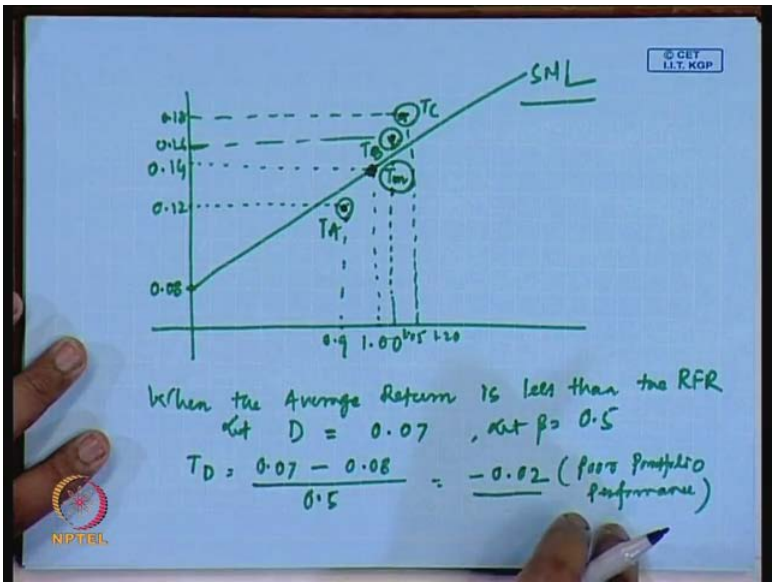

So, already if you remember, what is this SML? Let this is your already we have the risk free rate is 0.08. So, and your market return is market return is 14 percent. So, let 0.14, and this is your beta, this is 1.00. So, like that this is your SML line, this is your SML line, and this is basically you are we can say this T M what we are calculating, but then if you talk about T A, here the beta is it is giving how much return, it is giving the total return is 12 percent.

So, 0.12 and this is your beta value 0.9, but if you talk about the another two things, two stocks may be the B is giving 16 percent return, and C is giving 18 percent return, and the beta value is here in this case 1.05. And in this case, it will be 1.20, and the return will be 0.16, 0.18; this is your T A, T B and this is T C, this is your T A. So, here what we have seen, that there are two stocks which is getting above average return,, what this particular market index is giving.

For example, we have seen that another stock. And if you undoubtedly, if you want to say that which stock is very poor, if you ask yourself a question that which stock is very poor. When the average return the performance is very poor, then we can say when the average return is less than the RFR. If one particular portfolios average return is less than the risk free rate of return. That means, the portfolio is performing very badly. So, in this case let, another stock let D portfolio D, where the average return is let 7 percent.

And if you want to calculate the T D, then it will be 0.07 minus 0.08 divided by let beta is equal to 0.5. Even if the beta value is very less 0.5, it will be minus. So, poor portfolio performance what we can say - poor portfolio performance will be achieved, if your average return will be less than the risk free rate of return.

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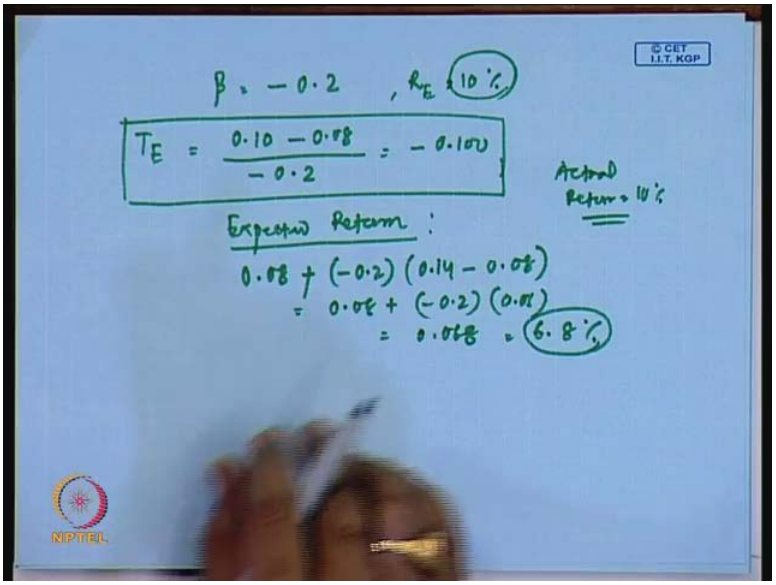

Another question also may araise here. Let the beta value is negative, you have assume the beta is negative; a beta is negative let the beta value is minus 0.2. Then what will happen in this case, let it is T E, let the return is R E is equal to 10 percent, then what you can say T E is equal to 0.10 minus 0.08 divided by minus 0.2. So, this should be giving you minus 0.100. So, in this case, can you say that the portfolio is performing badly no. It is not performing badly in this case, it is because the actual return is related to 10 percent, but we should compare it with your expected return to conclude.

Because it is very difficult to conclude something from here. So, here in this case the expected return will be 0. 0 8 plus minus 0. 2 betas into R m minus R f, R m are equal to 0.14 minus 0.08 that will give you 0.08 plus minus 0.2 into 0.06. So, the value will be 0.068. Now the expected return is 6.8 percent, but the actual return is actual return is 10 percent. So, therefore, what we can conclude that this stock is performing good in the market, even if in this case, this neither Treynor measure it is coming negative. So, therefore, sometimes it is difficult to use it, if the beta value and other things are negative.

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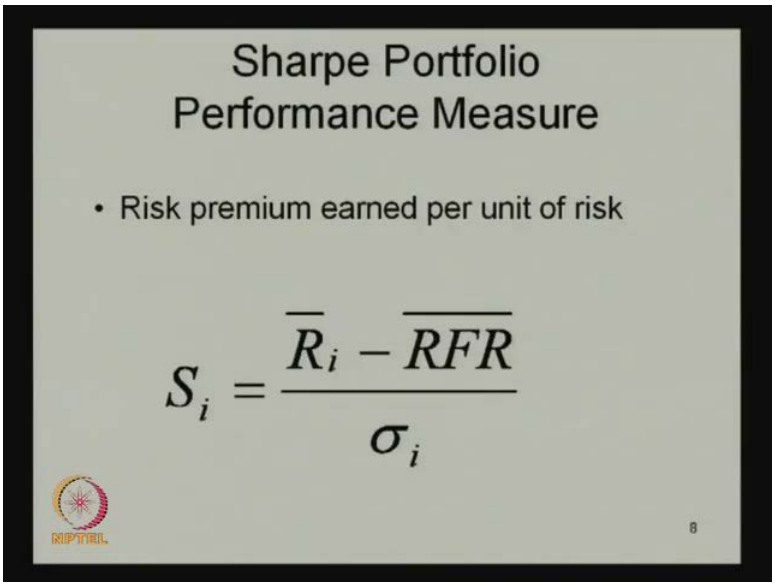

That is why, we can see comparison to see whether the actual return of a portfolio, let you in this case we have taken G was above or below expectations can be made using. Your expected R G is equal to your RFR plus beta into R m minus R f, and finally you compare your expected value with the actual value to conclude whether your stock is performing better or not.

Then the another argument what the another measure has been developed, which is generally defined as the Sharpe measure. And what this Sharpe measure was trying to say, that Sharpe has argued that it is not possible to diversify the total unsystematic risk in the market. Therefore, instead of only taking into account the market risk, we should consider also the unsystematic risk into the analysis. It is because, that it is not possible to diversify the total unsystematic risk, and make the unsystematic risk equal to 0.

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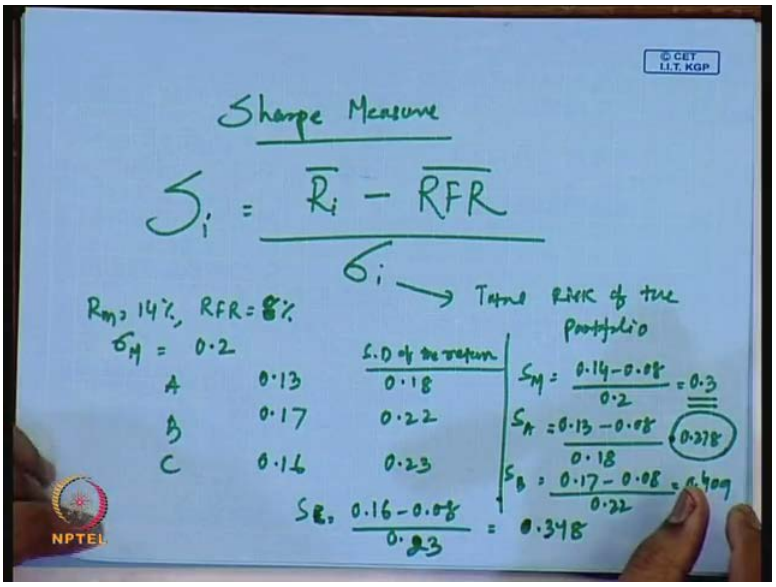

Therefore, what Sharpe Sharpe we have said, the Sharpe measures basically consider the total risk, the Sharpe measure consider the total risk that is why we denote it as S i is equal to again your R i bar is the average return over the period of the portfolio. Then your risk free rate over the period the mean period or the average period sigma i, and this represents the total risk, total risk of the portfolio total risk of the portfolio. And from there, we can conclude that how this Sharpe measure basically will be useful. You takes the example in this case, some example you can use it here also.

Let your R m is equal to 14 percent, your average risk free rate is equal to we have taken it 8 percent, then the standard deviation of or the variance of the market is 0.2. So, let we have the portfolio A, B, C - these are the portfolio. Then the return will be let 0.13, this will be 0.17, it will be 0.16. Then the standard deviation of the return it is let 0.18, 0.22, 0.23.

So, now if you want to make it the same way S M is equal to 0. 1 4 minus 0.08 divided by 0.2 which will give you 0.3. And your basically S A will give you 0.13 minus 0.08 divided by 0.18 that will give you 0.278. And S B is equal to 0.17 minus 0.08 divided by 0. 22 that will give you 0.409. So, like that if you take your S F S S sorry S B, S C then it will be 0.16 minus 0.08 divided by 0.23, that will give you 0.348.

So, now here also if you compare it with this market measure of the Sharpe, then these two are performing better or above the S M L, but this one is not performing better in that particular time period.

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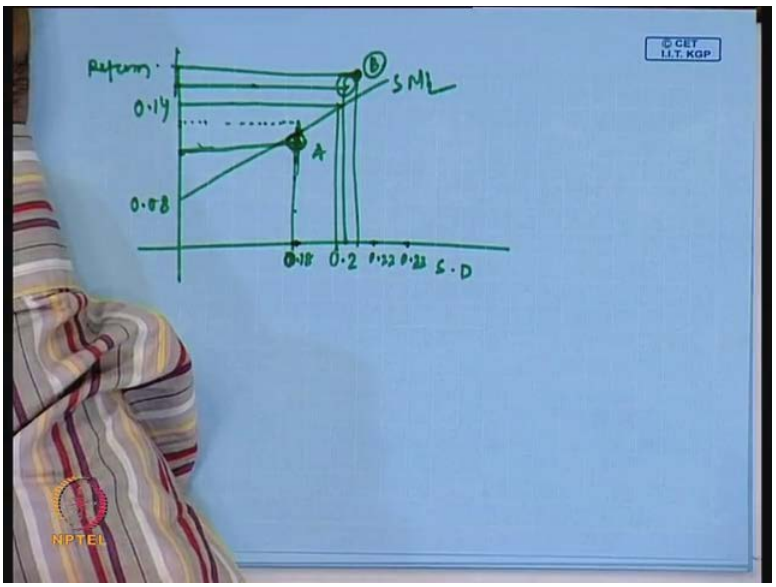

There also you can plot it in a S M L line, and how this S M L line will look like. You can also draw another rational line. This will be your 0.08; this will be 0.14, like that if you plot. It will be 0.2, if you take the standard deviation this is 0.18 0.22, 0.23. Then what will happen, that you are a portfolio will be somewhere here, which gives a return of 13 percent, return of 13 percent, return of 13 percent, but the particular value of this this risk is 18 percent.

So, find somewhere here, we had this is your A, and another case it is 17 percent. So, you will find this somewhere here, and 16 percent. We will find it somewhere here, this is your B, this is your C.

So, this is the way basically, we can this is your SML line. So, this is the way, we can say like this is your return the Sharpe measure can be used at the same as usual with a this Treynor measure. But only thing is, here the trey nor has considered only the market risk, but here Sharpe has used both the risk into the consideration.

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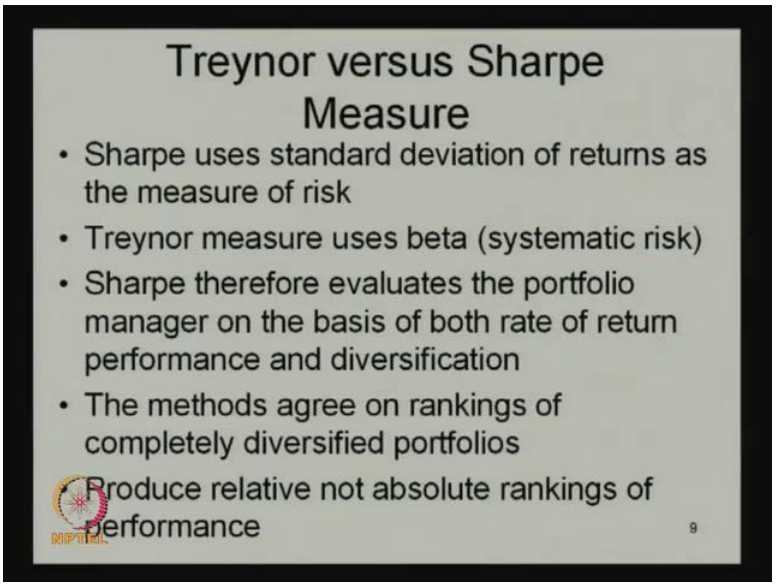

So, Sharpe uses standard deviation of returns as the measure of the risk. Treynor measure uses beta, if you make the comparison between these two. And Sharpe therefore, evaluates the portfolio manager on the basis of both rate of return performance, and the diversification. And the methods agree on a ranking of completely diversified portfolios, and to produce relative not absolute rankings of the performance performance. This is what the difference between these two.

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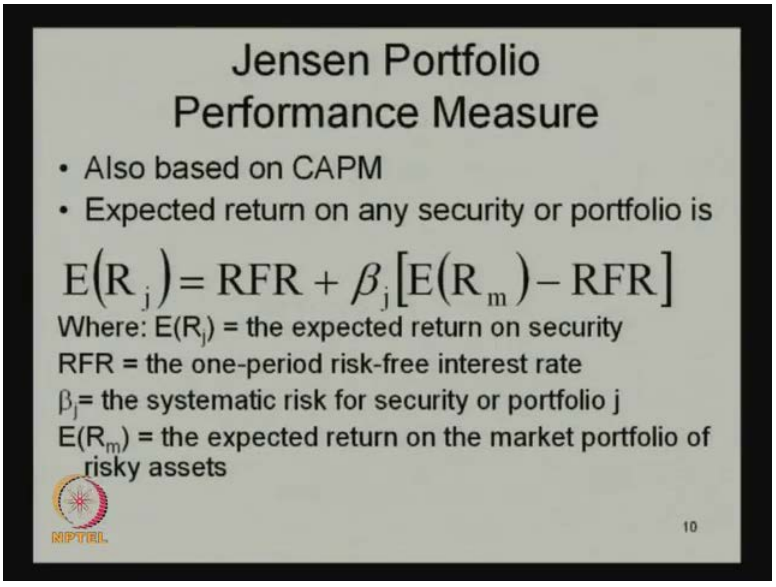

Then another popular measure, we always use in financial market to measure this portfolio performance that is called the Jensm's measure.

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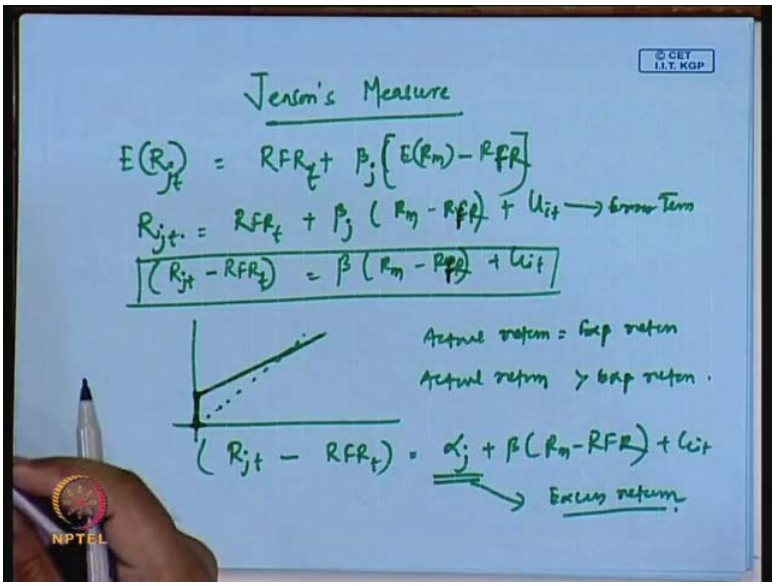

That is called the Jensm's measure. What the Jensm measure was trying to say - Jensm measure says that, you already know that Jensm has used this characteristics line. The expected return is equal to already we know RFR plus beta into expected R m minus RF – RFR. That already we know, and if you take your now the let R j, then you can say R j R j T beta j RFR t, SRF. So, here if you make it a regression it is statistical function, then your R j t which is nothing, but the RFR t plus beta j into R m minus R f plus u it, which is basically the error term or the (( )) term. You are converting from mathematical equation to statistical function.

Then you have (( )) R j t minus RFR, then you have the beta into R m minus R f plus u it that is dividing this RFR from both the sides, we get this equation. Then what we can say that basically, if you run this regression this is just like a straight line, and if you assume that the actual return is equal to your expected return. Then the intercept will be 0, and the line will start from here.

But if you assume that the actual return is not equal to expected return, then what will find - you will find an intercept for this; and this positive intercept is basically makes your actual return will be more than the expected return. So therefore, whenever you

estimate it this function may be looking like this. Your R jt minus RFR t will be equal to your alpha j, which your excess return beta into R minus RFR plus u it.

So, here this alpha j basically, and this excess return over the expected return, what basically we can get. So, what Jensm was trying to explain that, by measuring this excess return, we can do this?

So, what then this Jensm measure was trying to explain that, it is based on the basically already we know that it is based on the capital asset pricing model. And the expected return on any security or the portfolio is basically divide measure under this, expected return is equal to risk free rate plus beta into R m minus R f - where the expected R j is equal to the expected return on security. RFR is equal to the one period risk free rate of interest, beta is systematic risk for security; and expected R m is equal to the expected return on the market portfolio of the risky assets.

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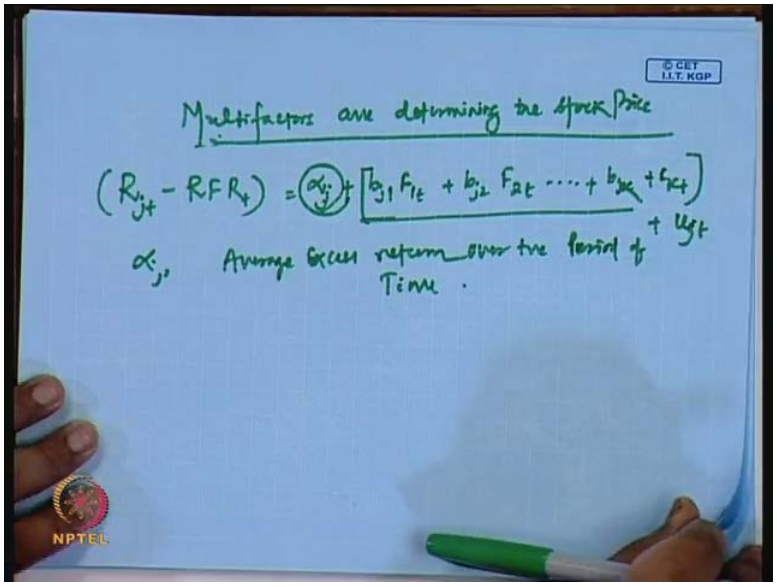

So, after this what Jensm was trying to say, that Jensm was Jensm was saying that let there are more factors - the multifactors multifactors are determining this stock price. Already we have discussed this things in our previous classes, that there are various models we used to measure the expected return of the equity. And the most simplest one is the capital asset pricing model then finally, we have the arbitrage pricing model. Then

finally, we have the multifactor model, which are basically used to measure the expected return of the equity.

So, in this case what again the Jensm said, if you use this multifactor model to find out this; then your R j t, RFR t is basically nothing but your alpha j plus beta b j 1 1 factor 1 t, beta j 2 F 2 t like that plus beta j k beta j 1, j 2, j 1, j 2, j k plus F k t. So, n plus u it sorry u jt. This is a function what we have to estimate, and from this we can calculate this expected return. Then your excess return from this will be a basically talks about the average excess return, average excess return over the period of time, over the period of time. That is what the Jensm measure was trying to explain.

Then the other measure also we have used in the market, which is not that much it is used in the passive portfolio literature, but it is not that much way to use the performance measure. This is called the information ratio, sometimes we call it the appraisal ratio.

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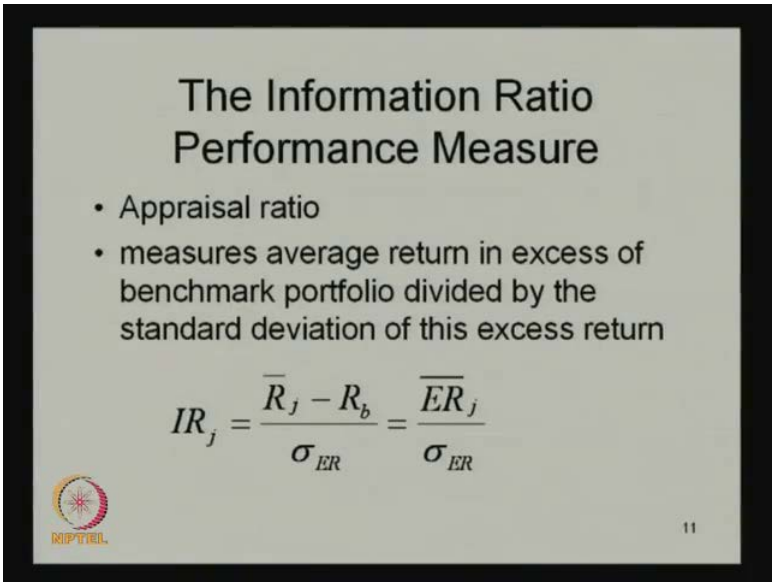

And what this information ratio was trying to measure, it basically measures the average return in excess of benchmark portfolio. Average return, measures the average return in excess of benchmark portfolio divided by the standard deviation of the excess return.

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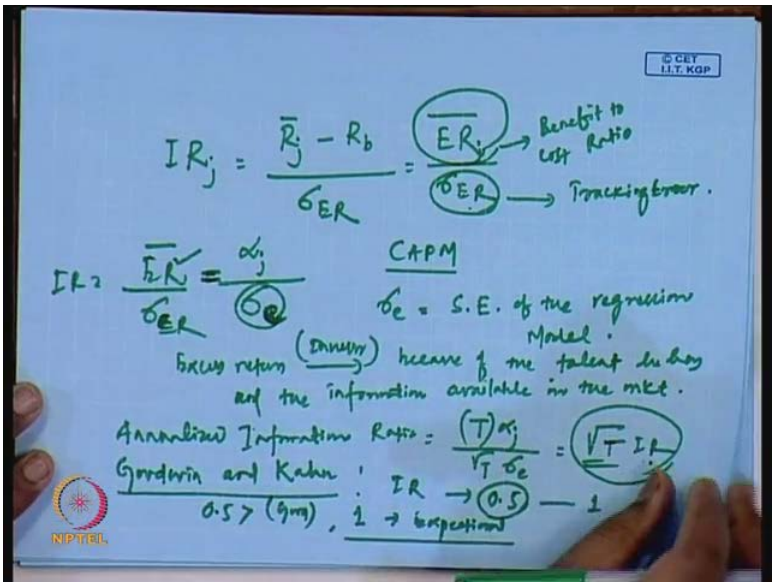

So that means, the variation of the excess return what basically. So, the information ratio let your I R j, already we have written here, R j bar and your R b - R b is basically nothing but the benchmark return divided by the standard deviation of the excess return between these two. So therefore, in short we can say that E R j divide by standard deviation of the R, if you remember correctly this is nothing but the the standard deviation of the excess return is nothing but the tracking error.

We have discussed, it whenever we are talking about the construction of the portfolio issues. Here always the portfolio manager wants to minimize the tracking error, what basically they get from the variation of the own portfolio, the return from the own portfolio, and the return from the benchmark index. Some people said that this is the benefit, and this is the cost. So, that is why it is the benefit to cost ratio benefit to cost ratio, some of the people has argued that.

So, what it basically represents - what this particular measure is represents, and we know that the excess return is nothing but the alpha j by the Jensm's. Jensm's alpha, and divided by the standard deviation of a this particular. And this is what where we get this, if you use a single factor model or the CAPM model to find out your excess return, then what we will find, that you will find you have done a regression between the market portfolio, and the individual portfolio. Then whatever things we get let the standard deviation e, the standard deviation e is nothing but the standard error of the regression

model, standard error of the regression model. And that we have to take into account here to find out the particular E R basically is equal to alpha. So, therefore, I R is equal to E R by this and finally, we have seen that this is alpha j e, the standard deviation of the excess return that already we have seen.

So, what basically this ratio represents - this ratio represents the mean excess return in a investor can get by utilizing his talent, and information over the bench market term. So, it is basically the excess return what this investor basically gets, because of the talent he has, and the information available in the market available in the market. So, you can also by tracking error, whenever we calculate the annualized tracking error or annualized information return, you can also do it annualized information ratio. That is basically, already you know that alpha j root of T into standard deviation of this root of the IR. So, on the basis of the period, whatever should be the annualized tracking error; like that we can calculate the annualized IR R.

So, there is a thumb rule for the IR'S. This Goodwin and Kahn Goodwin and Kahn, what they found that the IR ratio should varies between 0.521. And if it is having an IR of 0.5, 0.5 and above is good. And if you get one then it is basically exceptional, and it is sometimes we achieve it, but most of the time we may not achieve it, because some tracking error will be there always. It is, because that over sample size and other things we may not make our portfolio in a good diversified manner. So, therefore, it may not be that willing to this.

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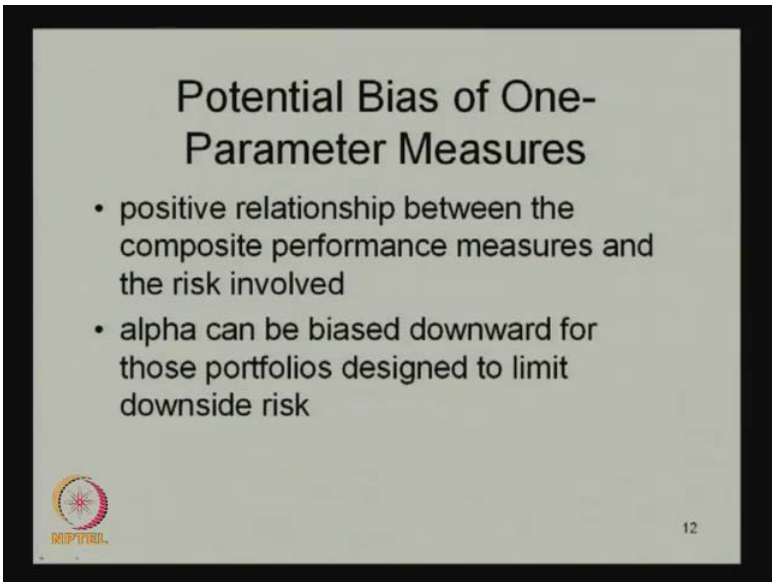

Then after talking about these things, what we have seen that there are certain measures we have taken into account, it may be a single portfolio single factor analysis which have certain limitations.

Therefore the positive relationship between the composite performance measures, and the risk involved. We found an alpha can be biased downward for those portfolio designed to limit the downside risk, that is we already we have discussed about this that the multifactor model, should be used to remove this biasness from the analysis.

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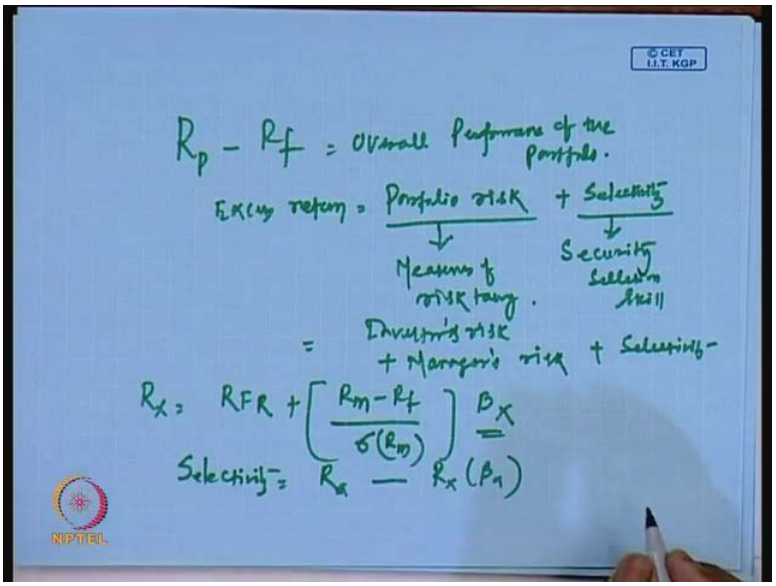

Then, after looking into these things, somebody have said that whatever portfolio performance we get, that portfolio performance is basically measured as your R p minus your R f. R p is the return from the portfolio. R f is the risk free rate, it is the overall performance of the portfolio overall performance of the portfolio, but the overall portfolio performance basically nothing but the excess return. So, what (( )) has said that the excess return is basically noting but, it talks about two things. One is your it is adjusted to the portfolio risk, because of the risk you get some return. And another one is he is use the word selectivity. What do you mean by this selectivity, that how this particular portfolio selection, the portfolio manager has made. So, that is why it basically talks about the security selection skill, security selection skill. And the portfolio risk is basically measures of risk taking, because of the risk you should get some return.

So, then the portfolio risk can be composed of two; this is your investors risk plus the managers risk, because investors risk may not be equal to the manager risk plus the selectivity.

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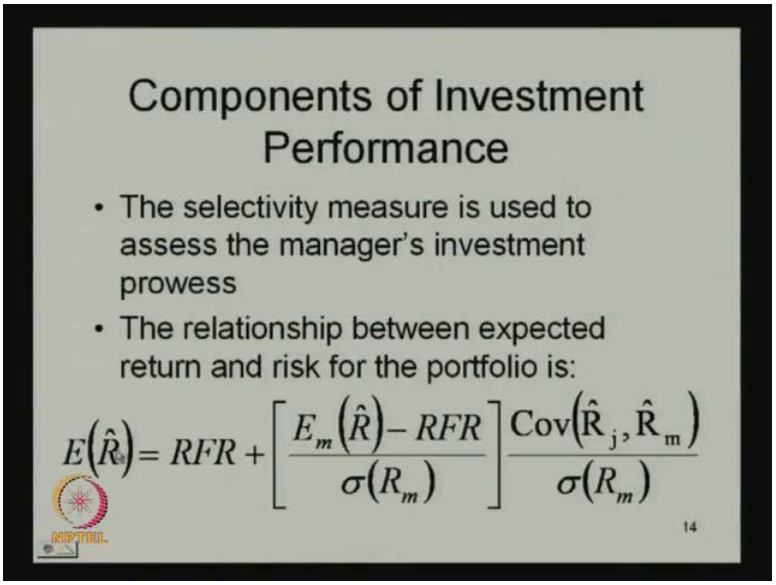

Then, that is why what this selectivity part basically talks about - the selectivity basically talks about that how this particular manager is performing. That is why the selectivity measure is used to access access the manager's investment prowess, and the relationship between the expected return and risk for the portfolio. In this context is your expected this is basically your calculated value, your expected return is RFR (( )) RFR. It is

adjusted to this variance from the market with the covariance of the stock with the market divided by the standard deviation of the market, which is nothing but the beta.

So therefore, what we can say - what this particular theory is talking about that R x, let you say that it is your RFR plus your R m minus R f divide by the standard deviation of the R m, what we can talk about into the beta x. So, what here what you talk about this, in selectivity how you can measure the selectivity is basically your return from the portfolio let R a, then we have your R x into beta a, because what (( )) said instead of comparing with this particular return with a market portfolio. You compare it with another portfolio which is a nice portfolio that means, it is not managed by any investor.

So, because of without any management if the whatever return they are getting. It may be, because of the market or it may may be because of the risk what they are taking into account. But if it is managed, then if you get some higher return, then we can say that this is because of the manager skill we are getting.

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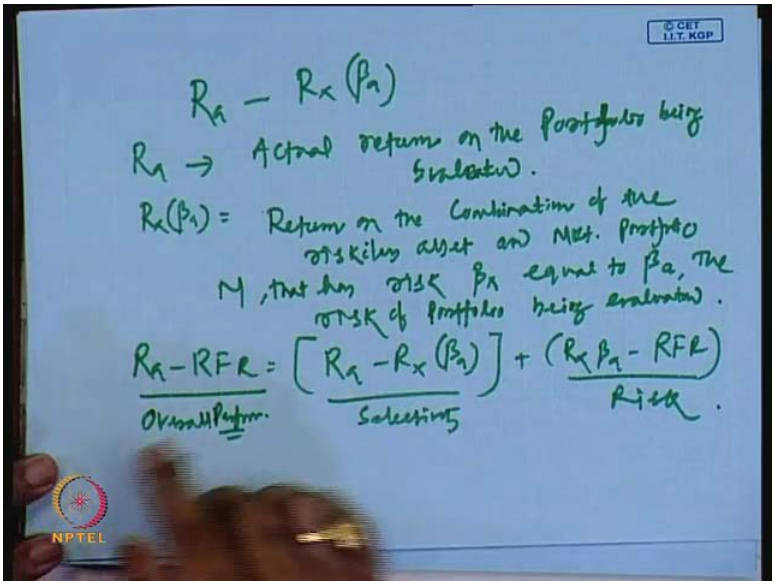

So, that is why what this your R a represents here. Here we have taken that your selectivity is your R a minus R x into beta a, and your R a is basically actual return on the, actual return on the portfolio return on the portfolio being evaluated. And and another one is your R x into beta a which is nothing but the return on the combination of the riskiness, combination of it is basically the return on the combination of the riskless

asset, and the market portfolio. And the market portfolio m that has risk of beta x equal to beta a equal to beta a. the risk of the portfolio being evaluated risk of portfolio being evaluated.

So therefore, what we can say that R a minus RFR is basically the overall performance, which is basically selectivity, which is your R a minus R x into beta a, this is one part and another part plus this is basically R x into beta a minus RFR, which is nothing but this is because of the selectivity selectivity, and this is because of the risk.

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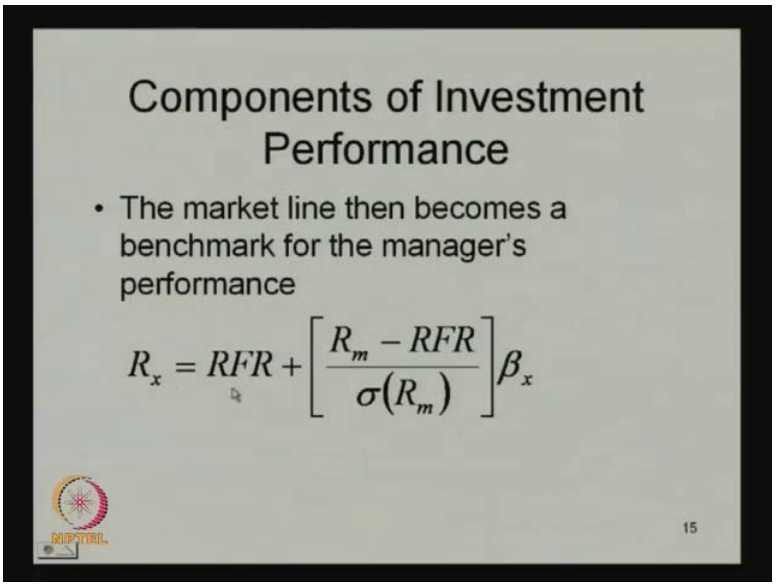

And this is your overall performance, this is what the (( )) was trying to explain between the composition of the components of the investment performance. So, therefore, the market line then becomes a benchmark of the manager's performance, what already we have already shown that that is why we get it this, R x is equal to your RFR plus your RFR plus R m minus RFR into standard deviation of the m into beta x. And finally, your selectivity will be R a minus R x into beta a.

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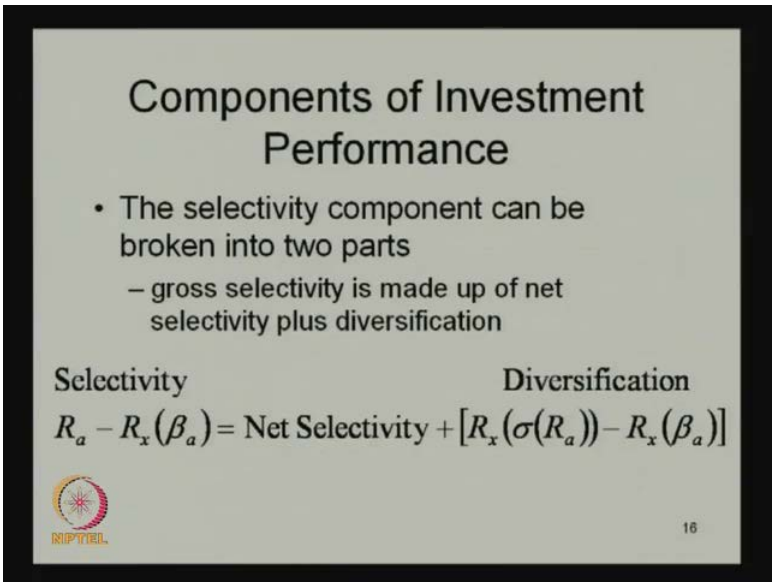

And the then if you see that, the selectivity has two components. Again this two components are basically this gross selectivity is made up of net selectivity plus diversification, because of the diversification some return we get, and because of own skills some return we get.

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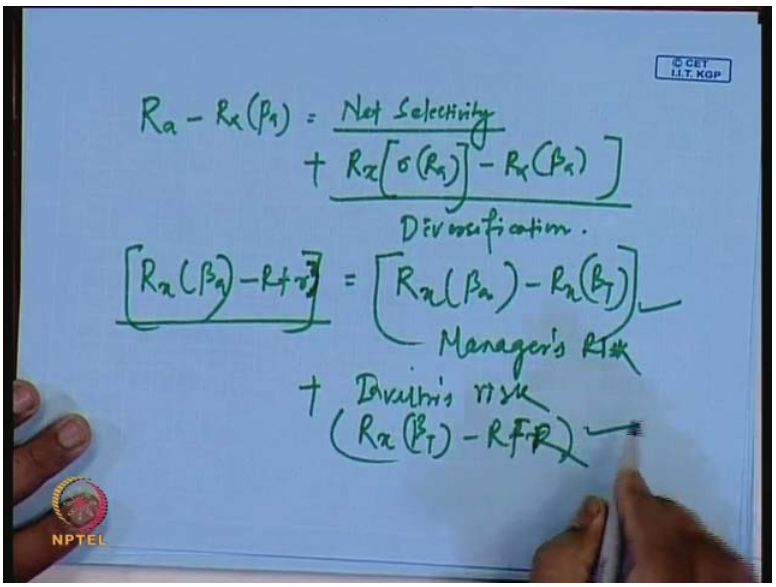

That is why what (( )) said that R a minus R x beta a is basically equal to your net selectivity net selectivity plus R x into sigma R a minus R x into beta a. Which basically

comes, because of the diversification; this comes, because of the diversification and this comes under because of the own skill of this particular investor.

So, therefore, it will be basically net selectivity, and how this net selectivity assume that the investor has a target level of the risk for the portfolio equal to beta T. Let the target level is beta T, the portfolio of overall performance due to the risk can be assessed as follows, how generally it can be measured. The risk is the R x into beta a minus Rfr minus Rfr risk into beta a minus Rfr, and this is basically the total risk. The manager's risk, it is basically your R x into beta a minus R x into beta T which is the target risk, and this is the manager's risk manager's risk plus we have the investor's risk, the investor's risk which is measured as basically R x into beta T minus the RFR. This is your investor's - this is the manager's risk, and this is your investor's risk.

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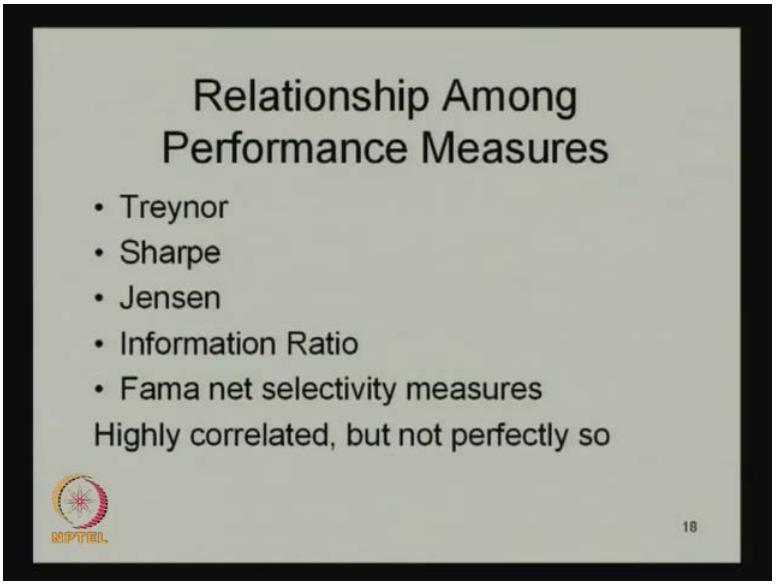

And from there, we can find out that how this particular composition of this particular, overall performance of the stock can be measured. Then we have, if you see that there are the people have made the study between the performances of all the measures. They found that they they are highly correlated, but not perfectly correlated. That means, one cannot be perfectly substitute to another type of measures.

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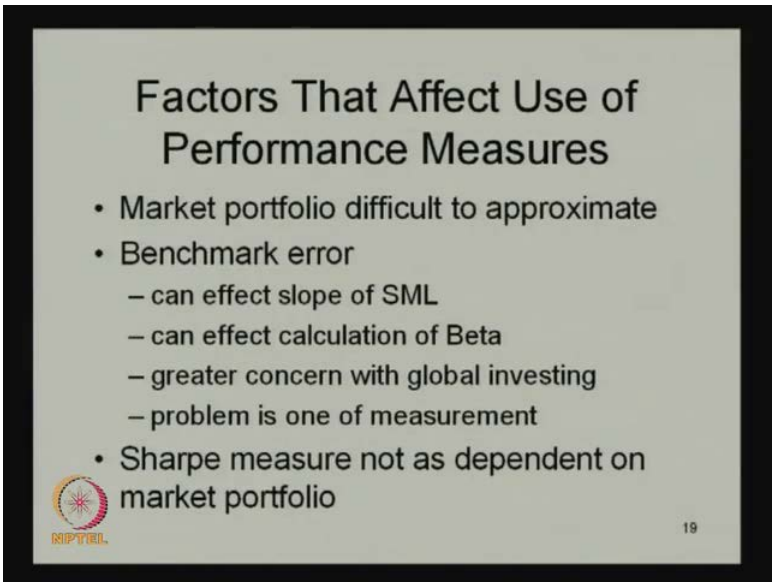

Which are the factors basically which affect your performance measure: One is your market portfolio which is sometimes very difficult to approximate, which is the greater market portfolio. Then we have the benchmark error the, if you benchmark error will be different then it will affect the slope of the security market line. It can also effect the calculation of the beta, and it will have the greater concern which also the global investment, because the contribution will come into the picture. The problem is one of measurement part that is, why the Sharpe measure not as dependent on the market portfolio, that is why we can say it is sometimes it can be used, but still it has its own limitations.

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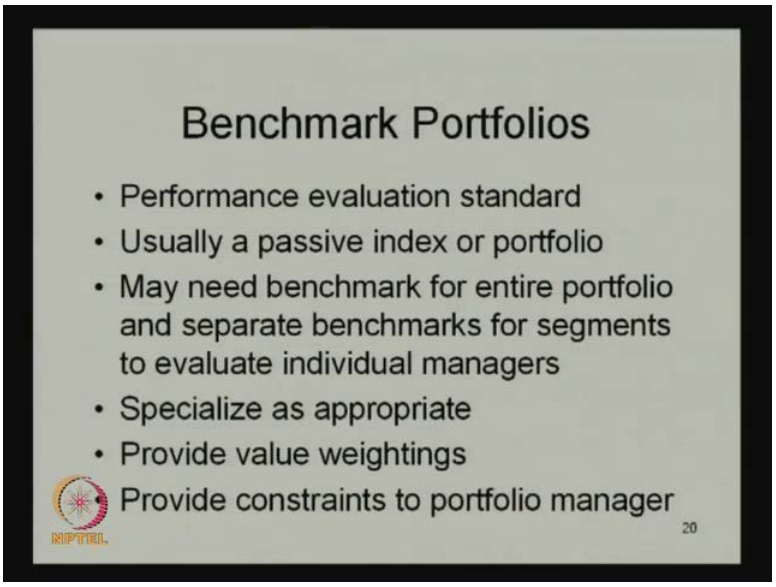

So, therefore, what we can say that whenever we compare it with a benchmark portfolio, and what should be the actual benchmark portfolio, that we have to know from the beginning the performance evaluation standard we have to know, usually a passive index is a benchmark portfolio. It may need a benchmark for entire portfolio, and separate benchmarks for the segment to evaluate the individual managers, and specialize as appropriate then only it will be easy to measure.

And provide the value weights to that particular benchmark portfolio by which, you can conclude that how this particular portfolio is performing. Then they provide the constant to the portfolio manager; that means, what we can say that if you are investing in a particular industry. So, your benchmark should not be the total sense or total such kind of index, it should you have to carefully decide that what should be the benchmark. And through which on you can make a comparison between your own portfolios is return with that kind of return.

So, therefore, it will be as much as specialized it it it should have, and all those weight should be evaluated. And we should provide certain constants to the different type of combination, because there are so many constraints the manager faces. And within this constructive environment how this manager is performing, because of that we should also see that in the different kind of difficult situation, how this particular portfolio is performing. That is why the stock should be given to that. So, therefore, we can say that

whether the portfolio manager is performing good or not. That is why we should provide that thing.

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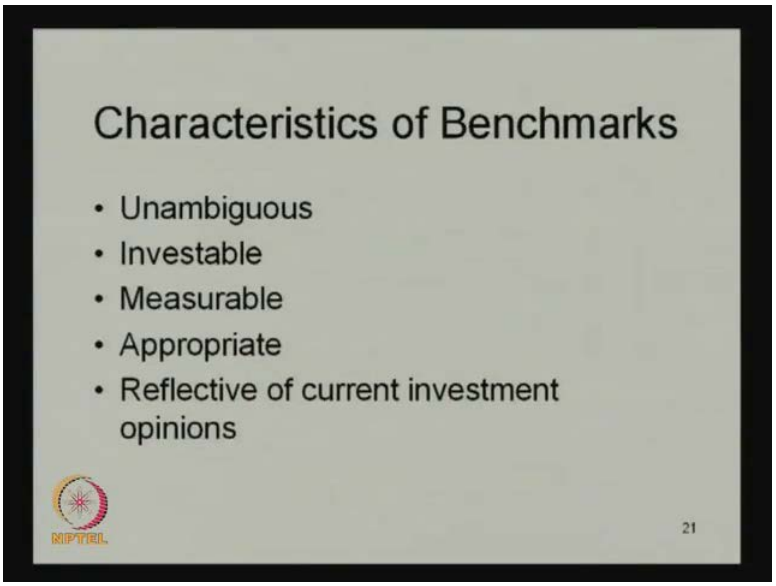

So, if you talk about a good characteristics of a benchmark portfolio, then it should be the portfolio should be an unambiguous portfolio, and it should be investable portfolio. And it should be measurable, it should be the appropriate for that particular analysis what we have taken into account.

And reflective of current investment opinions, because whatever day to day life. We can see that the market situation is changing, and depending upon the requirement of the investor, depending upon the market situation. This particular portfolio should have certain features, on which we can say that it is reflective of the current investment approach or the current investment opinions.

And it should have there should be any kind of ambiguity, whenever you talk about the characteristics of that benchmark. If there is an ambiguity then it cannot be used as a benchmark, because there is some complexity some kind of argument may be involved in that case. So, you should also take care of that thing. So, therefore, after deciding this benchmark portfolio, we can compare our portfolio with that portfolio.

So, after discussing about this part briefly about the different measures of the portfolio performance, equity portfolio more particularly; then we should know about in practice

how this tactical asset allocation is taken place in the market. And as well as also we will should know that, how this particular practically this particular performance of the portfolio can be evaluated in a general sense the. And again also third thing, we also should know that another type of instrument like bond portfolio, how the performance of the bond portfolio also should be measured.

So, after talking about this all this aspects, we can make a conclusion that in the market after making the investment. How we can reach a conclusion that the overall performance of that particular portfolio is really doing better in that particular time. So, that will be discussing in the particular next class, thank you.