Investment Management
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Lecture - 11
Equity as an Asset Class

Hi there. So, welcome back to the NPTEL MOOC course on Investment Management and we are in a 3rd week of this course. In this week we will learn about equity as an investment for investors who are looking for investment opportunities. So, to begin with let us understand the importance of Equity as an Asset Class and then try to understand different characteristics, learn tools to calculate return and understand risk and subsequently incorporate this as part of investment portfolio.

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So, in this session particularly we will talk about the return on equity assets and then we will also see how we can calculate the return and risk for an equity asset particularly from some numerical example.

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As we understand not every investor is interested in fixed income alone. We have discussed about bonds as an investment tool for investors in detail in previous sessions. And we know that bonds offer coupons or yield as a return rate of return for investors who are investing in bonds as an investment tool.

But we should know that bonds offer a fixed rate of return for bond holder, but not every investor will be comfortable or excited to have just the fixed rate of return and to risk them equity market as an investment opportunity comes in the picture.

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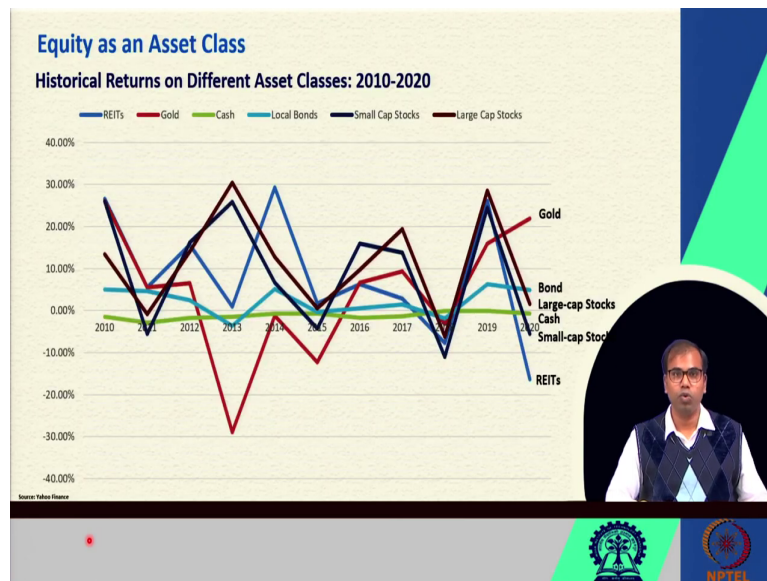
So, we will learn about the rate of return offered by the equity as an asset class and see how this is corresponding with the risk that they carry. So, to highlight the argument let us first take a look at the trend of different asset classes for let us say last 10 years. So, if we look at the rate of return on different asset classes from 2010 to 2020 we can see that different asset classes such as gold, bonds, large cap stocks, cash, small cap stocks and real estate investment trusts as asset classes have shown fluctuations in terms of rate of return over the years.

And from this graph we can see that some asset classes have been fluctuating more often compared to other asset classes and at the end of the sample period of this 10 year from 2010 to 2020 we see that golds are offering quite high return whereas, real estate investment trusts as an investment opportunity offers less return compared to other.

Cash as an asset class is offering more or less stable rate of return, but large cap stocks have been outperforming the small cap stocks, but that could not be the case all the time. Over a long period, it has been emphasized time and again that equity as an investment offers much better returns than any other asset class revealing in the market on an average.

So, looking at the importance of equity as an investment let us try to understand what are the characteristics that we must be familiar with as for equity as an asset class.

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For an investor there are different characteristics that matter to them for example, for some investors it is the return that matters more for some other investors it is the liquidity for some other investors it may be the risk that matters more. If it depends on what kind of investor we

are talking about and what kind of market scenario as well as the investment opportunities that we have in case.

So, for example, if we talk about government bonds, treasury bills, tax free bonds, national saving certificates, fixed deposits, savings bank account and recurring deposits these are financial products which offer low rate of return, but moderate liquidity. And when I talk about liquidity, I essentially mean the ease at which you can encash them. So, these assets these financial products offer moderate liquidity and they carry very little amount of risk in some cases negligible or even nil risk.

When we talk about assets of financial products such as deposit schemes of different public sector units or infrastructure companies, unit linked insurance plans or other insurance products they offer moderate rate of return they have low to high liquidity and they have moderate risk as well.

Mutual funds, debentures, corporate bonds, certificate and treasury bonds offer moderate rate of return and low to moderate level of liquidity as well as they carry moderate risk. When it comes to IPOs, FP FPOs or direct investment in equity market they do offer high rate of return they have low to moderate liquidity, but they also carry moderate to high risk.

At the end we have collective investment schemes such as hedging, derivative trading, currency swaps, credit default swap, CDOs, mortgage back securities and other similar assets, which offer substantially high rate of return they are moderate to high liquid, but they also carry huge amount of risk. So, when it comes to the choice of investment the characteristic that matters to a particular investor should be placed higher and then accordingly decision has to be taken.

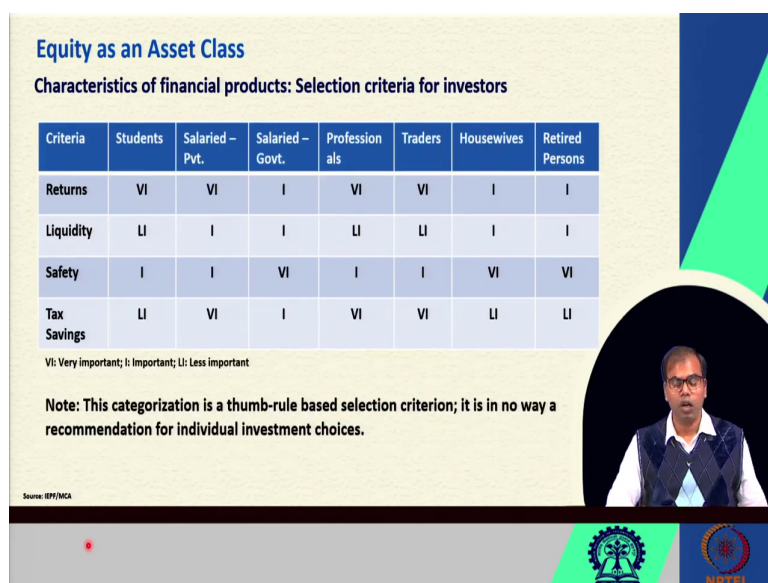(Refer Slide Time: 06:45)

Equity as an Asset Class

Characteristics of financial products: Selection criteria for investors

Criteria	Students	Salaried – Pvt.	Salaried – Govt.	Professionals	Traders	Housewives	Retired Persons
Returns	VI	VI	I	VI	VI	I	I
Liquidity	LI	I	I	LI	LI	I	I
Safety	I	I	VI	I	I	VI	VI
Tax Savings	LI	VI	I	VI	VI	LI	LI

VI: Very important; I: Important; LI: Less important

Note: This categorization is a thumb-rule based selection criterion; it is in no way a recommendation for individual investment choices.

Source: IEPF/MCA

If we look at a generic guideline with respect to the importance of each of these characteristics such as return, liquidity, safety and tax savings and I draw this inference from a published report where say which says for students return might be very important, liquidity might be very little important, safety might be important and tax saving does not matter to them at all.

For salaried particularly those who are working in private sector may be returns is something that is very important to them, liquidity would be important and safety would again be important. For people of salaried class tax savings must be very important similarly for those who are salaried in government sector returns and liquidity might be important, but safety will be very important, tax saving will be important as well.

For professionals may be returns is something that is very important, liquidity might not be as important, safety would be important, but tax saving will be very important as well. For traders essentially those who are in business profession returns and tax savings would be very important, but liquidity might not be as much important and safety would be important. For housewives as an investor returns and liquidity will be important, safety will be very important, but tax savings might not be as important.

For retired person returns and liquidity might be important, safety will be very important and tax saving might not be important at that stage. So, this is a very generic classification or characteristics of financial product that might be used as a selection criteria for investor.

But we should also be mindful that this categorization is a thumb rule based selection criteria and it is in no way a recommendation for investment choices that we make as an investor. Again, we know that different financial products, different investment opportunities offer a different combination of these characteristics such as return, liquidity, safety and tax savings.

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So, let us start with equity as an asset class. Earlier we have discussed about fixed income security particularly bonds as an asset class now we will focus on equity as an asset class. So, equity essentially is partial ownership in a company. When I hold a share of a company, I am essentially the partial owner of that particular company.

In a sense it is securitized instrument of partial ownership securitized because it can be traded with other people which means if I hold the share of a company, I can sell this share to anyone else who is willing to buy at a price that we both agree without disturbing or without directly informing the company at as such.

Most of the time equity or common shares or shares for that matter are issued for the first time through an initial public offering via an exchange such as Bombay Stock Exchange or National Stock Exchange in India and these are the these are issued in terms of either

preference shares or common equity shares which are characterized by return and risk, which means if a company is showing preference share typically it is bound to pay certain dividend, certain percentage of dividend to the preference shareholder, but that kind of commitment or obligation is not there in case of common equity share.

For common equity shareholders the dividend is paid only if the company is able to make some profit and the board of director has approved the payment of dividend to the equity shareholders. Similarly, risk characteristics might be different for different types of shares. In this case when we talk about return it implies that return could come to the investor in the form of dividends and or capital gain or capital growth.

Because return is the prime objective for any investor to make an investment in any financial product or financial security be it bond or equity because it is the motivating force and principal reward in the investment and return can be realized return as well as expected or future return.

So, realized return is something like an actual outcome of investment which means if I invest 100 rupees today and I wait for 1 year and I sell that financial product for 120 rupees after 1 year then 20 rupees on the top of 100 rupees of initial investment is my realized return. And expected return is something that I expect in future and which is provable over a future period of time. So, let us try to understand this calculation of return on equity shares in different context.

So, let us first try to understand the historical return. So, historical realized return is something that occurs over a period of time a particular period at in it includes both the return that might be occurring in the interim period as well as the capital gains, which means if we look at the financial product and suppose that financial product happens to be a stock suppose we invest in that stock on date t and we pay a price that is P t.

So, whenever we pay a price, this price has to be a negative value because it is an outflow of cash and then if the stock which we have purchased which we have bought for a price P, P is a dividend that is dividend D t plus 1 which is dividend at time t plus 1 which is next period and we also sell the stock for a price P t plus 1 at time t plus 1.

And my cash flow for from this investment is basically dividend and the price that at which I have sold that stock. So, if I sell that stock for let us say 100 rupees purchase stock at the and

the beginning of the period which is time t and I have sold the stock for 120 rupees and in the meantime, I have also got a 5 rupee of dividend.
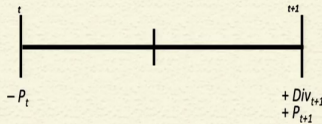
Then my total cash flow is 125, which basically is my total inflows and the return for the investor or the rate of return that we have to calculate needs to consider both these capital gain as well as the dividend that might be that might have been received in the interim period.

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So, realize return from this investment in the stock from time period t to t plus 1 which is time 0 to time 1 is total return in terms of dividend yield or dividend that is received by the investor in the interim period and the capital gain yield. So, basically, we can express this rate of return calculation or total realized rate of return in terms of the dividend that we have received plus the price changes that we have seen.

So, if we focus on this particular part this is the dividend yield part which is dividend received by the investor upon the price which was paid by the investor in the beginning and this is the capital yield part, which is basically the percentage increase in the price of the investment or price of the stock. These two combined together is basically indicated as the total realized return based on the numbers associated with a particular stock or for that matter any financial product.

Let us say if we take an example here with some hypothetical numbers let us say that the there is a company that paid a one time special dividend of 30 rupee 80 paisa on March 15. So, the dividend that is paid is 30 rupee 80 paisa and now suppose the investor has bought this particular share for 280 rupees 80 paisa on March 1st. So, this is the price at t and the investor has sold after the dividend was paid for a price of 273.90 which is price t plus 1.

So, if we have to calculate the realized return from this investment decision which was done in terms of the initial payment of 280 rupee 80 paisa in terms of the price that at which the stock was purchased a dividend that was received in terms of 30 rupee 80 paisa and a final price at which the stock was sold is 273 rupee 90 paisa. Then the realized return from this investment for this particular holding period that is March 1st to March 15 is calculated in terms of dividend yield plus capital gain.
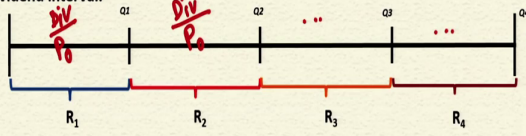
So, dividend yield is 30 rupee 80 paisa as a proportion of total price which was paid in the beginning and the capital gain that was earned in the beginning from the beginning period to the end period and some total of these two component of return is 0.851 which is 8.5 percent. So, we can say that on this investment of 280 rupees 80 paisa on March 1st if sold on March 15 after receiving the dividend for 273 rupee 90 paisa the rate of return is 8.51.

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If we have an investment that pays multiple interim income let us say instead of 1 year yearly dividend if we have quarterly dividend to be paid, then we can calculate in a very similar fashion because the value of this particular investment in and the calculation of return for this particular investment will be adjusted accordingly.

Here one basic assumption that we are working with is all dividends are immediately reinvested and they are used to purchase additional share of the same security and with this assumption if we can try to calculate the annual realized return we can use the same argument here let us say this is the timeline and these are four quarters and these four quarters have four different dividend payments.

So, we have dividend payment in terms of R 1, R 2, R 3, R 4 calculated in terms of rate of return and when we have to calculate the annual return for this particular investment, then realized annual return can be calculated by using this argument where we add all the return for individual period together and therefore, we can calculate the annual realized return on this particular investment.

Here it is to be noted that it is dividend payment divided by price 0 again dividend payment divided by price 0 for individual period. And then it is noted that these dividends are reinvested and used to purchase additional shares and that is how we get rate of return for the entire period divided into 4 quarters.

Suppose we extend the example similar example where we have a company which whose stock is purchased on December 1st 20 let us say 19 or any period for that matter and held it for one year. And if the company pays certain dividends let us say this is the dividend payment that was made by the company.

So, first period dividend was 30 rupee 80 paisa, second period like this, third period and so on and if the share is valued at 257 rupees at the end of November month then what could be the annual realized return? So, we can calculate in the same fashion first we have to compute the realized return between each individual dividend interval using the previous formula and then we determine one year return by compounding them.

Historical Return and Risk of Stocks (cont.)
Computing Realized Returns

Suppose you purchased Sinfosys Ltd.'s stock on December 1, 20x9, and held it for one year, selling it on November 30, 20x0. If the company paid the following dividends, what was your annual return?

Date	Dec. 1, 20x9	Dec. 31, 20x9	Mar. 31, 20x0	Jun. 30, 20x0	Sep. 30, 20x0	Nov. 30, 20x0
Price (Rs.)	280.80	273.90	259.30	254.90	271.30	257.00
Dividend	-	Rs.30.80	Rs.0.80	Rs.0.80	Rs.0.80	-

First, we compute the realized return between each dividend interval (using previous formula):

Date	Dec. 1, 20x9	Dec. 31, 20x9	Mar. 31, 20x0	Jun. 30, 20x0	Sep. 30, 20x0	Nov. 30, 20x0
Price (Rs.)	280.80	273.90	259.30	254.90	271.30	257.00
Dividend	-	Rs.30.80	Rs.0.80	Rs.0.80	Rs.0.80	-
Return	-	8.51%	−5.04%	−1.39%	6.75%	−5.27%

Then, we determine one-year return by compounding them:

$$1 + R_{annual} = (1 + R_1)(1 + R_2)(1 + R_3)(1 + R_4) = 1.0275; R_{annual} = 0.0275 \text{ or } 2.75\%$$

So, in a very simple way we can calculate the annual realized return for this investment in terms of first calculating the realized return for each quarter. So, first quarter this is the realized return, then realized return for each sub-period and then subsequently we can add all those returns to find a value of 1.0275, bringing this one to the right hand side we get 0.275 as the annual realized return.

So, we can say that on this particular investment the annual realized return is 2.75 percent. With this example we understand the concept of realized return from the value of historical prices.

If we try to calculate annual return which is for a an average annual return for a period we can calculate average annual return of an invest on of an investment during a sample historical period which is nothing but the average of the realized returns for each period and this period in this case could be one year or multiple years.

In this case if R t has been indicated as the realized return for a security in each year then the average annual return for from year 1 to let us say any number of year for example, year T would be the sum total of all individual returns divided by T to find the average annual return. And again the assumption here is distribution of possible return is same over time. So, average return calculated in this fashion provides an estimate of the returns that we should expect in a given year.

And if you look at the example here in a hypothetical case suppose that average return of nifty index for the last 5 years are given as following where in 1 year it was 4.9 percent in second year it was 15.8 percent in third year it was 5.5 percent in fourth year it was minus 37 percent and in fifth year it was 26.5 percent, then we can calculate the average annual return on the nifty index or any investment that is following nifty index in the same approach.

We have 1.5 1 by 5 multiplied with the sum total of all these 5 returns and the average annual return is 3.1 percent in this case. Again, for every calculation let us accept the assumption if we change the assumption the approach the value the calculation approach might change as well.

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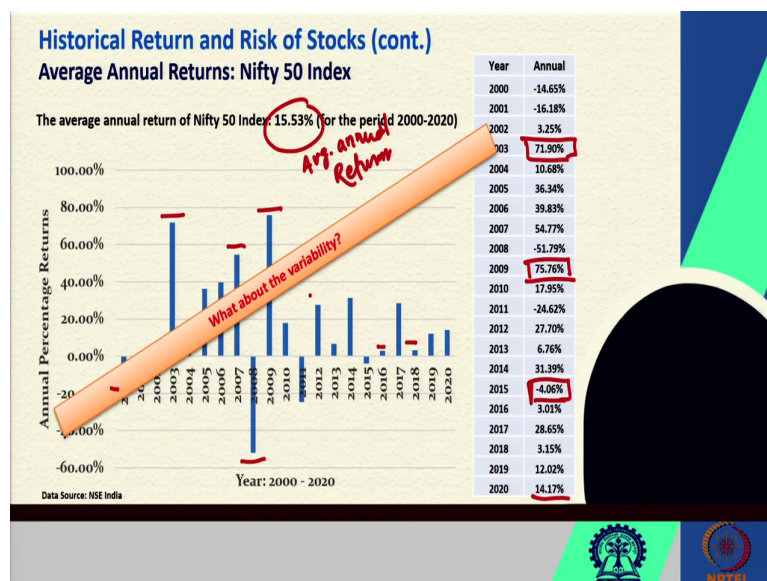
So, talking about nifty index in the context of Indian stock market let us take an example of Nifty 50 index where we can try to calculate the average annual return. Suppose that we have

the data for Nifty 50 index where we have an annual percentage change in the value of nifty index let us safely express this as annual percentage return.

So, the these are the values of annual percentage return from year 2000 to 2020 and these are the numbers. From these numbers we can just calculate the average rate of return in terms of annual return for the for Nifty 50 index and we find that it is 15.53 percent. So, all we have to do it just we have to sum all these values and divide it by 20 because it is for 20 years and we can find the average annual return.

Now, average annual return calculation is as simple as that, but what about the variability? Variability means we can see here that in some cases the return is negative in some other cases it is highly positive right. So, highly negative highly positive and then on some cases it is close to 0, right.

We can see it from the numbers here it is minus 4.06 percent in this year, but 75.76 percent in this year 71.90 percent in this year and so on. So, the variability is there. So, to capture that variability we need to consider calculation of the variance which is an indicator of risk because it is the variability that essentially indicate the uncertainty about the rate of return that an investor is expecting.

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To find the variability we use the standard deviation as an indicator of the distribution of realized return. So, the standard deviation is calculated or expressed as the square root of the variance of the distribution of realized return which means if we have a set of realized return over a sample period of time we calculate the variance which is basically calculated in terms of the deviation from the mean and squared a value.

So, square root of the variance is denoted as the standard deviation and standard deviation can be indicated as the risk measure for the stock or the financial asset for that matter. We know from our understanding of basic statistics that variance measures the variability in returns or a series of data by taking the differences of the return from the average value and then square it.

So, what we do is we first find the deviation from the average where R hat is basically the average and R 1, R 2 is individual return. We square it and then we sum it all and then find the variance. Once we have the variance in terms of variability squared variability squared root of the variability, we use standard deviation which may which can be denoted as the volatility indicator and we use the square root of variance as the standard deviation or the risk measure for that particular financial asset.

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Let us take a look at the numbers that we were just showing earlier with respect to the Nifty 50 index. Here index is a proxy portfolio we can use any other financial asset for that matter for which we have the data in terms of their prices or price changes. Here it is considered the percentage change in the value of index as the return here and we have already seen that it has

generated on an average 15.53 percent of average change in the values which is also indicated as the returns.

So, to calculate the variability what we have to do is this is the average value, we see every return this is R 1, R 2 and so on. So, we can use the deviation from the mean which is average value and then square it sum up them all and then we find the variance. So, the approach here is to calculate the risk to find the deviation from the average value.

So, as highlighted earlier average value is 15.53. So, average value being a 15.53 we find the deviation from the average. So, in first case first year it is minus 30.18 percent in second year it is 31.71 percent and so on.

So, we calculate the deviation from the average, we squared all those deviations and then we calculate the value of variance by applying this formula where R 1, R 2 is individual values of return R dash is basically the average return which is 15.53 percent and then we square the difference which is square deviation indicated here. So, R i minus average R squared.

So, this is the square deviation we sum up them all and we find the variance and when we do the standard deviation calculation, we just square root the variance which is 1.8966. So, this is the standard deviation.

So, for this particular series of numbers or the value of return indicated with respect to Nifty 50 index or any proxy portfolio of that index we have the average rate of return to be 15.53 percent and we have the standard deviation to be calculated as 0.30794. So, we have this square deviation divided by T minus 1 which is one approach to calculate the variance.

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Here earlier I was indicating as 1.8966 divided by 20 minus 1. So, that will be the accurate approach of variance and this will be the value of standard deviation given the numbers. Once we have the standard deviation calculated we can indicate the risk and return in terms of standard deviation and the average value of the price changes.

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And a that is why we that is how we get the value of risk and return with respect to any financial product or stock particularly in this case. To conclude the discussion done so far on the return and risk of an equity asset or financial product in general we must highlight that the return is something that an investor has invested in any financial product in the first place.

So, investor's prime motive for investment is financial return either in the form of periodical income which could be dividends in case of equity assets and a lump sum gain which is capital growth when the investor is willing to sell or selling the product. Returns can be calculated in terms of observed return or realized return over a sample period or it could be indicated as expected rate of return for a holding period such as annual rate of return or quarterly or monthly or even in some cases daily rate of return.

Along with return we need to also consider risk as an indicator because risk is usually denoted in terms of variance or the standard deviation of returns generated over a sample period and it is also said that if an investment carries higher risk the investor should expect higher return from such an investment.

And to quantify this we should highlight that there exist a structured relationship between return and risk of any financial security and we will discuss more about this structured relationship between risk and return in subsequent sessions. That is all for now.

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Thank you very much.