Security Analysis and Portfolio Management
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Lecture - 03
Introduction (Derivatives - I)

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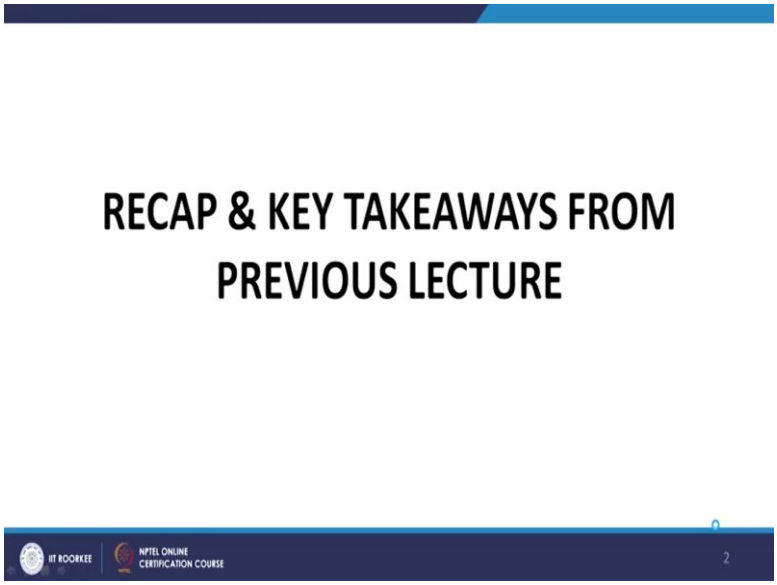

Welcome back. So, let us continue from where we left off yesterday. Before we do that, a quick recap of what we had discussed in the previous lecture.

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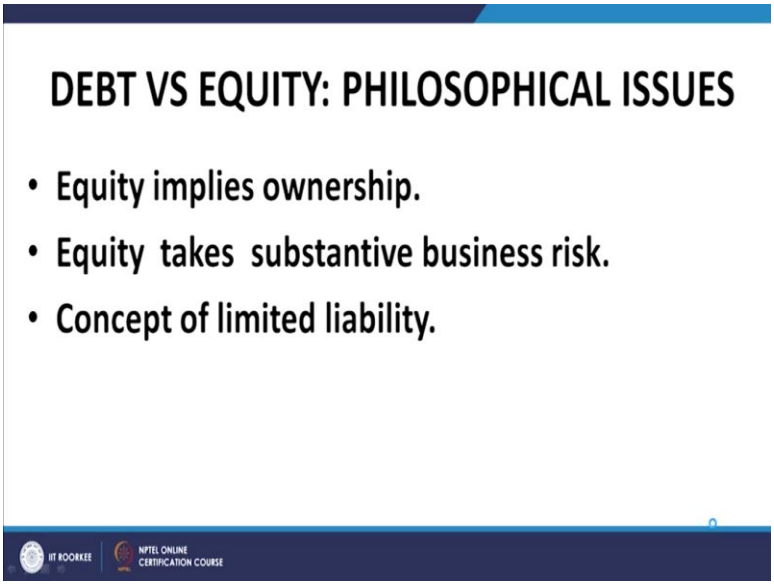

A large portion of yesterday's lecture was devoted to, to examining the philosophical issues associated with the distinction between debt and equity. As I mentioned, equity implies ownership. An equity shareholder, even if he holds one share in the company, is a part owner of the company. However, debt implies lending. There is a contract of lending and borrowing between the issuer of debt and the holder of debt instruments/debt securities. An underlying contract of lending and borrowing i.e. a loan agreement or an indenture subsists between the two parties.

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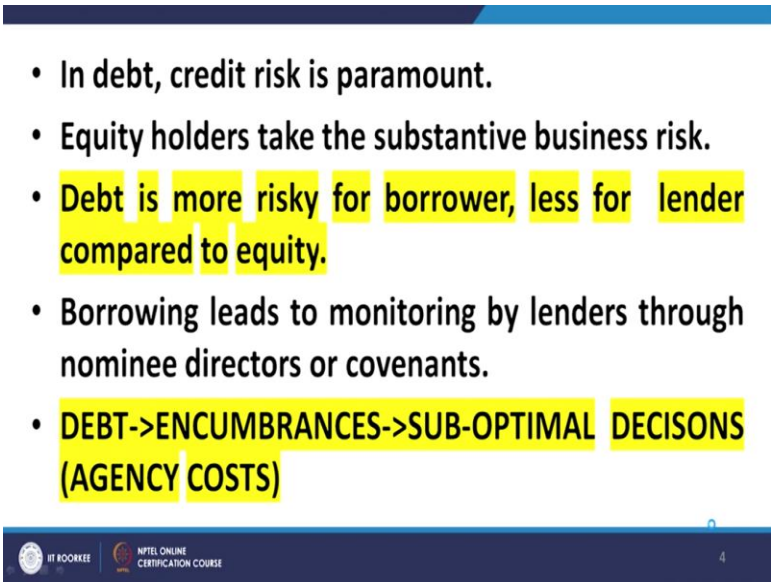

However, this is the technical distinction between debt and equity. At the philosophical level, we need to note that it is the equity shareholder who takes the substantive business risk, whereas the risk of lenders is confined to the possibility of default in the recovery of the principal and interest thereon. From the point of view of the lenders, repayment of debt and interest enjoy the pre-emptive right over payments of equity dividends or of equity capital.

The risk associated with lending is less for the lender compared to that faced by the equity holder. From the borrower's perspective, of course, borrowing is more risky than equity capital, because, as I mentioned, the interest on debt is a charge against the profits, it has to be arranged for and it has to be debited to the profit and loss account irrespective of whether the company is in profit or loss.

Then we also discussed the issue of agency costs, the costs that arise out of taking sub-optimal decisions and due to the conflict of interest between the lenders and the equity shareholders.

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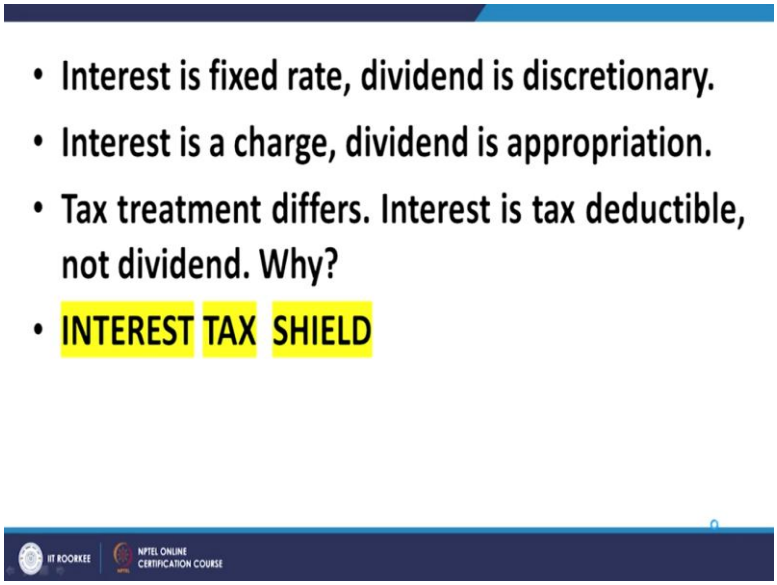

Further, interest is usually, though not essentially, a fixed rate payment. In most cases, it is fixed rate although we have innovative instruments which carry interest at rates which are tagged to certain other underlying instruments. We will talk about them later on in this course. Dividend is discretionary. Dividend is an appropriation of profits while interest is a charge against the profit.

This is the fundamental philosophical distinction between debt and equity. Interest is charged against the profits, it has to be debited to the profit and loss account like all other expenses, irrespective of whether the company ends up in profit or loss. Dividend is a distribution of profits. You would normally distribute dividends only when the company has earned profits for the year. Of course, if there are accumulated reserves, they can also be used for dividend payments. Uncommitted reserves can be used for the payment of dividends. Nevertheless, dividends are essentially an appropriation of profits. Because they are an appropriation of profits, the income tax legislations do not treat them at parity with expenses, while interest is treated at parity with other expenses and is allowed as a deduction when we compute taxable income, thereby resulting in a lower tax liability. The dividends are not so allowed.

This phenomenon of the interest being allowed as a tax-deductible item gives rise to Interest Tax Shield because it results in a reduction in the tax liability of the company. This reduction in tax

liability due to the debit of interest to the profit and loss account and in the computation of taxable income is called Interest Tax Shield. This was the example that we discussed yesterday.

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	A	B
Gross Profit	60	60
Other Expenses	20	20
EBIT	40	40
Interest	0	12
PBT	40	28
Tax	12	8.40
PAT	28	19.6
Capital	100	40
ROE	0.28	0.49

But the major takeaway that emanated from the discussion yesterday was that the when a company takes debt and engages in leverage (leverage means the use of debt in lieu of equity), higher the amount of leverage, higher is the magnification of the results of the company, irrespective of whether the results are positive or negative i.e. irrespective of whether the company has earned a profit or incurred a loss.

The outcome would be magnified if the company is levered. The more the leverage of the company, the more is the magnification of the outcomes of the company's net results or the bottomline irrespective of whether it is a profit or a loss. So that is the significance of the use of the word leverage. Leverage actually arises from the word lever, which is a mechanical device to magnify the effort at one point and its transmission to another point.

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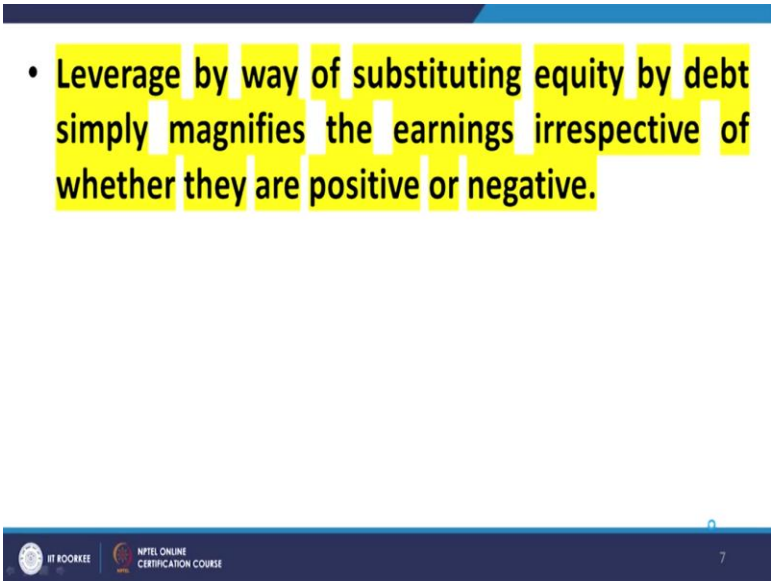

So leverage (or the substitution of equity by debt) leads to magnification of the outcomes or the performance of the company.

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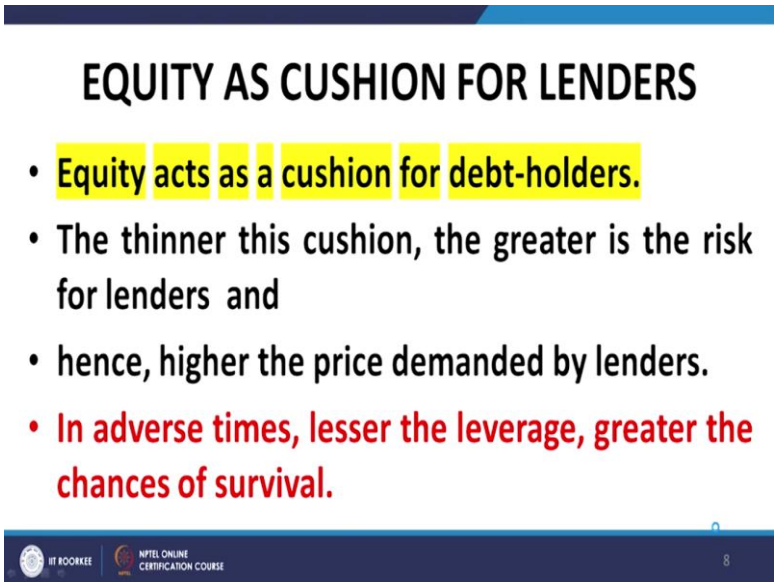

Then, we discussed the issue that equity acts as a cushion for lenders. The thicker this cushion is, the lesser is the risk faced by the lenders and the more willing the lenders would be to lend money to that company. As a result of this, the company could get debt financing at a lower cost.

However, if the cushion is thin or, in other words, if the debt equity ratio is high, there is low equity and high debt already in the company, then incremental lending would be viewed upon negatively by the lenders. Even if they do they do end up lending to the company, that lending would be at higher rates of interest, because the lenders would perceive lending to this particular company, which has a high debt equity ratio, as highly risky lending. In fact, higher the leverage higher would be the price demanded by the lenders, higher would be the interest rate demanded by the lenders when they lend money to such companies.

Another fallout of this cushion aspect is that in adverse times, the higher this cushion, the greater is the sustainability, the greater is the possibility of survival of the company. This is because when you borrow funds at fixed costs, you have to debit it to the profit and loss account irrespective of performance. So, the, the losses get magnified in adverse times.

However, if you are totally equity financed, then there is no debit on account of interest to the profit and loss account. As a result of this, the outcomes of the company are not adversely affected to that extent. For equity financed companies, the losses would be confined to operational losses and there would be no debiting of interest and magnification of those operational losses due to debt interest. So, the takeaway of what I am saying is that if a company has a low debt equity ratio, it would have greater chances of survival, greater chances of sustenance in adverse times.

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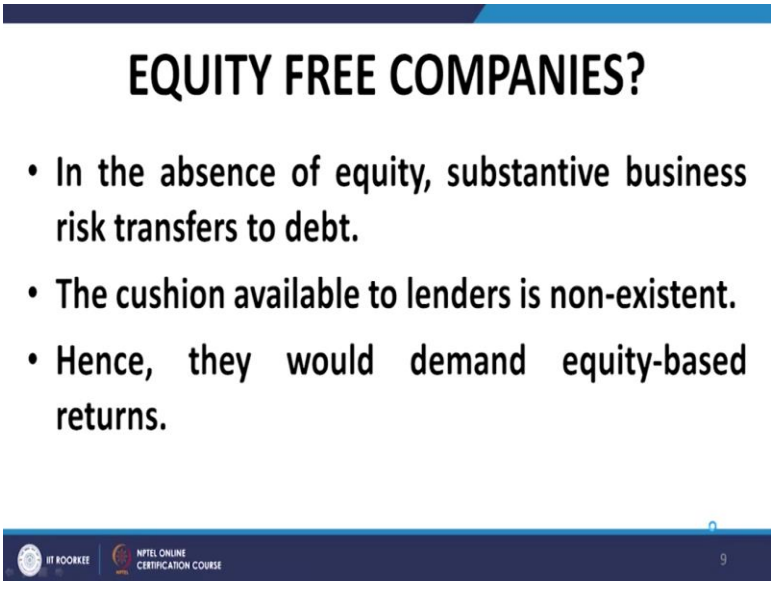

Can we have equity free companies?

Well, we have talked about debt relatively cheaper than equity, why? Because the, the risk faced by lenders is lower than the risk faced by equity holders. This is because of the pre-emptive rights of lenders. So, the issue arises, can we have totally debt financed companies? Well, obviously we cannot for one reason that you need equity to float a company, but this is a trivial reason.

At a philosopher level, at a deeper level, you cannot have a totally debt financed company for the simple reason that nobody would be willing to lend you money if you do not have any equity cushion, because lending money to a company which does not have equity, tantamounts to debt holders taking the substantive business risk.

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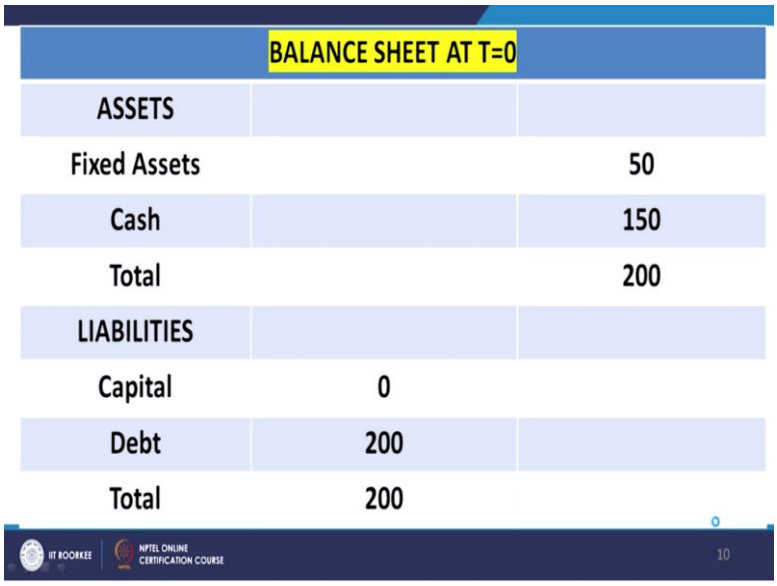

You can see that from this particular example, which is a carry forward of the discussion that we had yesterday. Let us say, a company starts with a capital of 0 and the company is totally debt financed or it has an infinitesimally small equity capital and a large debt capital. Then what will happen in the event of any loss of the company? Because there is no equity capital to back up those lossesm, to absorb those losses, the entire loss would be transferred to the debt holders.The business loss as it is, would then be faced by the debt holders because they would not be able to recover their principal and interest.

You would like to recall here the issue of Limited Liability. If the equity capital is small, then the lenders have to face the risk. Why they have to face the risk? Because the equity shareholders cannot be asked to bring in more than what they have taken up in terms of shares, in companies which are limited by shares.

So, if the company is limited by shares, as indeed most of the companies in the commercial arena are, the liability of shareholders is confined to the nominal value of shares that they have taken up. So, they cannot be asked to bring in any more money. Because they cannot be asked to bring in any more money, if there is a shortfall on the liquidation of assets of the company, then that shortfall has to be naturally borne by the lenders. So, smaller the amount of equity capital, the more risky is the lending to that company and the more reluctant the lenders would be to lend money to that company. Therefore, the issue of equity free companies does not really arise.

And what about Limited Liability?

We discussed this concept in detail. The liability of shareholders, who invested money in the company is confined to the nominal value of shares that they have taken up. If they have taken up fully paid shares then their liability is completely extinguished, they cannot be asked to bring in any more money in relation to their shareholding, irrespective of the performance of the company.

Why this is necessary?

This is necessary for the simple reason that shares are normally traded. If the liability of shareholders i.e. the liability of people who have invested in shares of a company was not limited, then there would hardly be people willing to take up shares or willing to buy shares in the market. Because if their liability is unlimited, they would be extremely reluctant to invest in the company, particularly at small numbers, when they do not have any significant say in the decision-making process of the company.

So, in order that shares are traded without any inhibitions, without any impediments, it is very necessary that the liability of those who are investing in the company is clearly defined and is known in advance and this is the backdrop of why the concept of Limited Liability came into existence. Well, while we do not have equity free companies, and we indeed cannot have equity

free companies, for reasons which we have just explained, we do have several reputed companies with very little debt or negligible debt on their balance sheets. The reasons arise from our discussions on this topic, which we have carried forward from the last lecture. Normally, debt is associated with debt covenants, and there are managements who have the philosophy of total freedom on operations and who are not willing to accept any covenants, any restrictions, which may be imposed by lenders. If a company is doing well, then obviously, it would rather prefer going for an equity issue to fund future operations if the need be rather than taking up debt for the simple reason that the management may not want to be bound by covenants by encumbrances arising from the indentures in relation to debts.

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Then there is the issue of agency costs, which we also discussed, i.e. the possibility of conflict between the motives and interests of lenders vis a vis the owners of the company. If a company has lendings and the lenders have some say in the company, for example, through nominee directors, there could be conflict of views of those nominee directors compared to those of the promoters of the company and as a result of which sub optimal decisions may be taken.

Costs of bank bankruptcy may be significant in some cases. If a debt financed company goes bankrupt, then the costs of liquidation become an issue. As I mentioned just now, the survival prospects of debt ridden companies in adversity are lesser compared to a company that has equity financing. Because the equity firm has a lower fixed charge, it can go through or pass

through times of lower production and poor economic conditions compared to companies which have debt financing that necessarily to pay interest to that lenders.

So, companies which are equity financed may not have to face those types of bankruptcy costs as companies that are having significant debt capital if the firm gets liquidated at the instance of the creditors. Then of course, there is that intangible perception, latent perception, that debt free companies are viewed upon positively by the market. There is a positive image attached to companies that have lower debt. For example, we can take the case of Infosys, which has a very low debt, negligible amount of debt on the balance sheet and this contributes significantly to the high esteem in which Infosys as viewed by the investing public.

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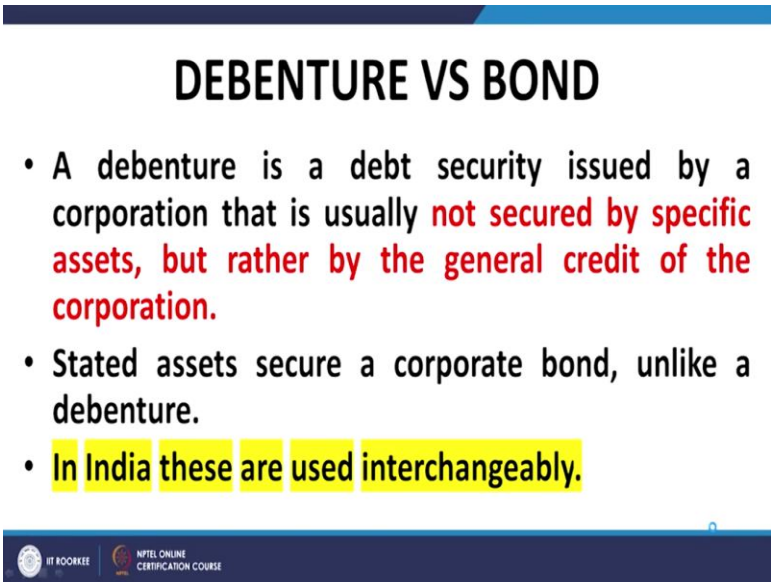

Now, before we move forward some items of nomenclature that we normally use. A ‘debenture’ is one such term compared to a ‘bond’. Bond is obviously more common. Although in India they are used interchangeably, debenture usually refers to debt offerings by companies, whereas bond is a broader term which can refer to debt offerings by the government, state governments and by municipal corporations as well as by bodies corporate and trusts. So debt instruments which are offered by a wider class of organizations are termed as bonds. Debenture is a slightly narrow term which applies to in debt offerings by companies.

The second important difference, which is normally not well known, is that bonds are usually secured by some assets of the company or are secured by some sort of security in the form of

either a fixed charge or a floating charge on the assets of the issuer. Debentures are usually unsecured and the marketability of the debentures is associated with the creditworthiness of the issuer as a whole (as an enterprise) rather than being tagged to any particular set of assets of the company. So bonds are usually secured by the assets of the issuer, debentures are usually unsecured, although we do have secured debentures also, but usually debentures are in the nature of unsecured debt instruments. So that is the basic difference between these two instruments. A debenture is usually unsecured while a bond is secured.

In India, of course, they are used interchangeably. Debenture usually refers to debt offerings by corporates, companies that is, whereas bonds refer to a broader class of debt instruments, which include offerings from the government, state governments, municipal corporations and so on.

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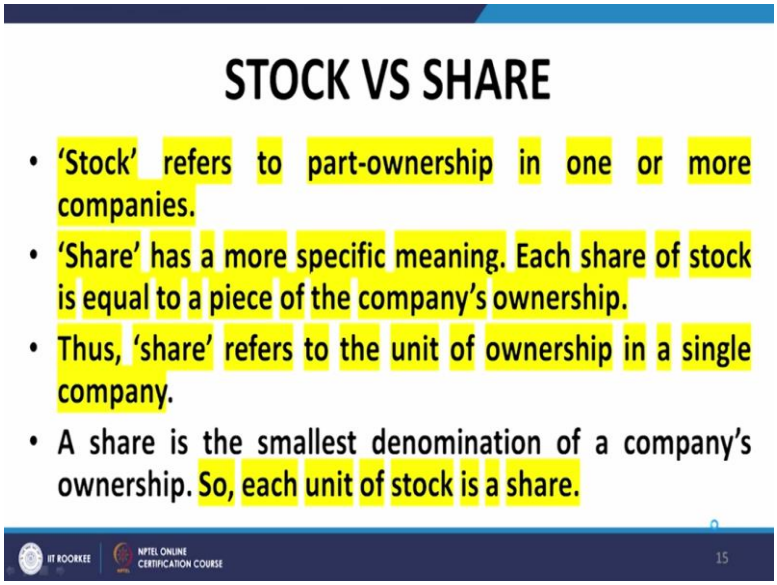

Now, there is another point that which I would like to discuss, the difference between stock and shares. This is another term which is not really very well understood. So, I will devote a minute to discussing this point. As far as stock and shares are concerned, a stock is a collection of shares. For example, if somebody holds a number of shares in a company or a number of shares in different companies, he would be set to be invested in stocks. A share is the lowest denomination in which the ownership of the company is split up and in which trading is done or in which the share capital of the company is denominated. So share represents the smallest fraction of the ownership of the company which can be transferred or which can be given to a

particular investor. So, in some sense stock is a collection of shares. Those shares may, of course, may be of a particular company or of a number of companies taken together. So, share refers to a unit of ownership in a single company. It is seen as the smallest unit of ownership in a single company. So, in other words, we can also say that each unit of stock is a share.

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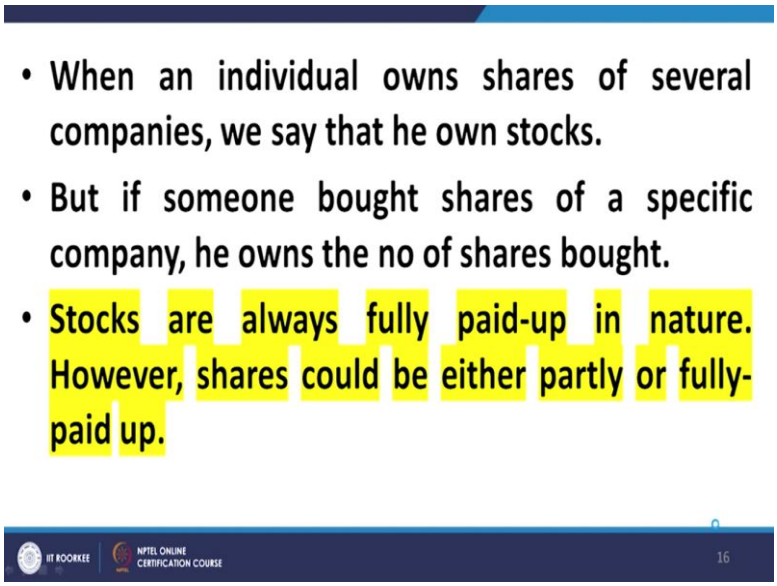

Now, usually, stock represents to fully paid-up shares, whereas in the case of shares, the shares may be fully paid up or the shares may be partly paid up.

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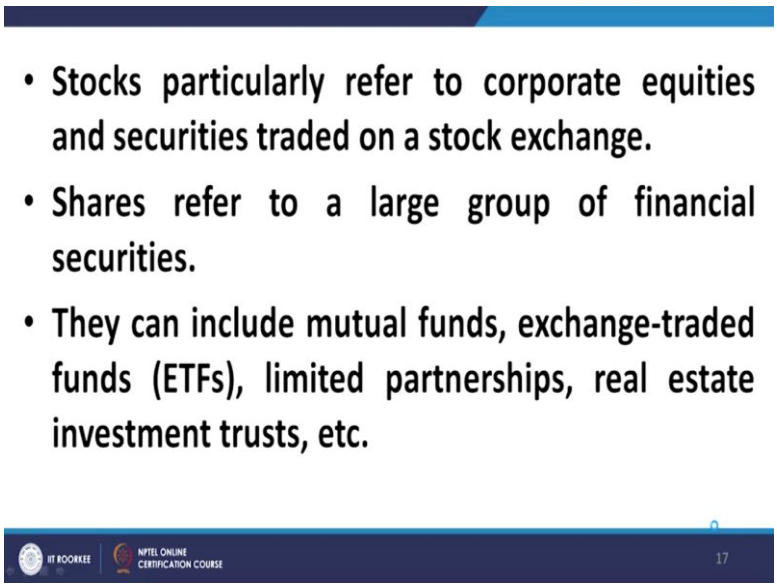

Thus, as I mentioned, share is a part of the ownership, but ‘share’ also allows for a much wider interpretation in the sense that when we talk about shares, not only do we talk about the ownership of companies or the smallest denomination of ownership of companies, we also talk about shares in a mutual fund, an investment scheme, a limited partnership or real estate and so on. So, shares have a wider connotation, but the basic thing is that they are the smallest units of those wider investment avenues, whereas stocks represent collections of shares. In fact, shares are the smallest fraction of a stock. Stocks could be a collection of shares in many companies, not necessarily one company and stocks are normally viewed as shares of limited companies that are listed on the exchange.

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Now, having discussed the concept of debt and equity in some detail, I come to an exciting new area, which is ‘derivatives’. At this point, I will not go into a lot of detail in talking about derivatives. The objective now is to simply introduce you to this field, which is the buzzword of modern finance, and which forms the most important, I may say, the most attractive segment from the investor perspective of various investment avenues.

So, what are derivatives? What are the various fundamental types of derivatives? What are their applications? Why are they so special?

These are some very interesting questions which I will briefly touch upon in today's lecture. But, of course, I propose to devote about one third of this course to a detailed study of derivatives, but that will be coming after I talk about bonds and equities in detail.

So, starting with derivatives. I will give you a backdrop. Derivatives are very appropriately known as the “wild beast of finance”. Why they are termed as the “wild beast of finance”? Because derivatives have been attributed to or have been held responsible for numerous massive scandals in the financial market, scandals which have wiped out billions of dollars of investor wealth in very small intervals of time. For example, you can talk about Enron, Lehmann Brothers, Kidder Peabody, etc. There are so many others as well. Even Enron, as I mentioned, is attributed partly to the to the mispricing or the misreporting of derivatives or mis-provisioning rather, of the losses that may possibly arise out of derivatives. But the point is that several scandals that have rocked the financial world have been attributed to the use or misuse, the abuse, of derivatives.

So, let us see what derivatives are. Well, a derivative, as the name signifies, is a financial instrument that derives its value from another instrument. ‘Derivative’ comes from the word ‘derive’ and ‘derive’ relates to the derivation of value of the financial instrument from another instrument, and that another instrument is known as the underlying.

So, a derivative is a financial instrument that derives its value from the value or the price or the worth of another underlying instrument. Now, what these underlying instruments can be. Well these underlying instruments can be equity stock, stock indices, interest rates, real estate, commodities, bonds, treasury bills, government bonds as well.

So, there is a multitude of instruments, not only instruments but other underlyings, that can form the underlying of a derivative instrument, and the derivative could be written on any of these instruments, and it could be treated accordingly. If it is listed, we will talk about that as well. There are 4 fundamental types of derivatives that we normally encounter, that we normally study at this level.

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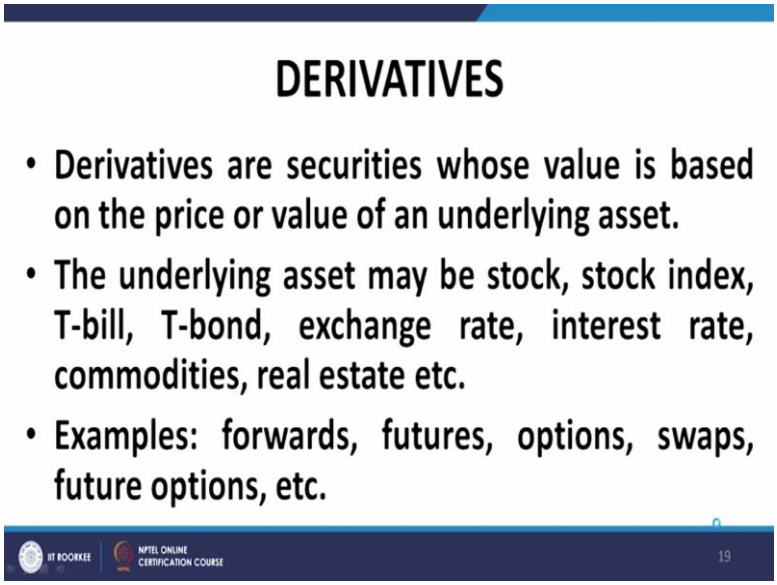

They are forwards, futures, options and swaps. So, these are the four fundamental types of instruments that are usually present in the derivatives market.

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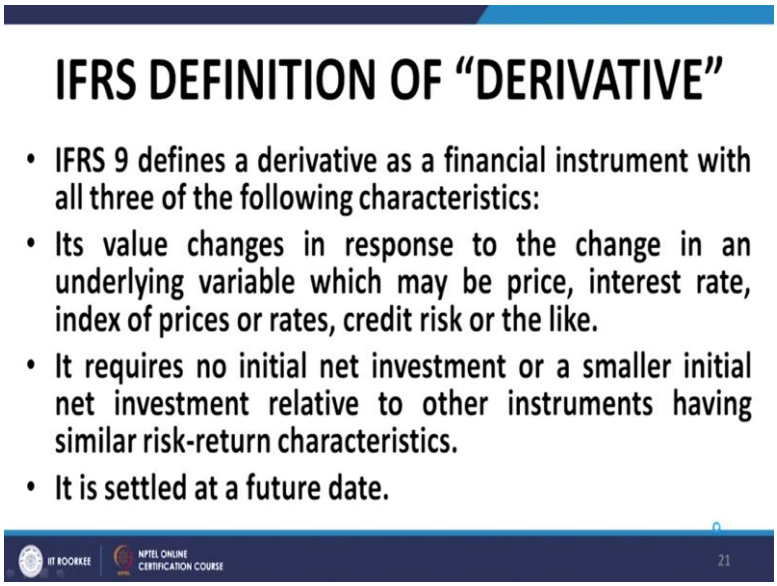

Now, talking about derivatives at a more formal level, we can discuss the definition of derivative in the IFRS, the International Financial Reporting Standards. IFRS, Standard 9 defines a derivative as a financial instrument with all the three of the following characteristics (that means it needs to have each and every one of the following characteristics):

(i) its value changes in response to the change in an underlying variable. So, it is dependent on an underlying variable. The value of the derivative is dependent on the value of an underlying variable. That underlying variable may be price, interest rate, index of prices or rates or credit risk as well. Innovative derivative instruments are being created using credit risk as the underlying factor.

(ii) The second point that IFRS 9 requires is that derivatives require no initial net investment or a very small initial net investment when compared to the other instruments that have similar risk return characteristics. In order to take a position in a derivative instrument, for example a forward or a future, you need to make very little investment compared to other instruments like spot instruments i.e. if you have to take similar position in spot instruments, or instruments that have similar risk return characteristics.

(iii) Derivatives are invariably settled at a future date. So, in the context of derivatives, we need to take account of two dates (a) the date on which the derivative contract is initiated or the date on which the investor takes a position in the derivative contract and (b) the date on which the contract is actually settled. So, I reiterate the there are two important dates in relation to derivative contracts. First, the date on which the contract is negotiated, the date on which the contract is agreed upon or the date on which the investor takes a position in the contract. Second, the date on which the contract is actually settled or the contract matures. This date is called the maturity date. The date on which the contract is settled, the date on which the contract matures for settlement is called the maturity date.

So, now as far as the price of the derivative is concerned, I just mentioned that the price or the value of a derivative depends on the price or value of the underlying asset.

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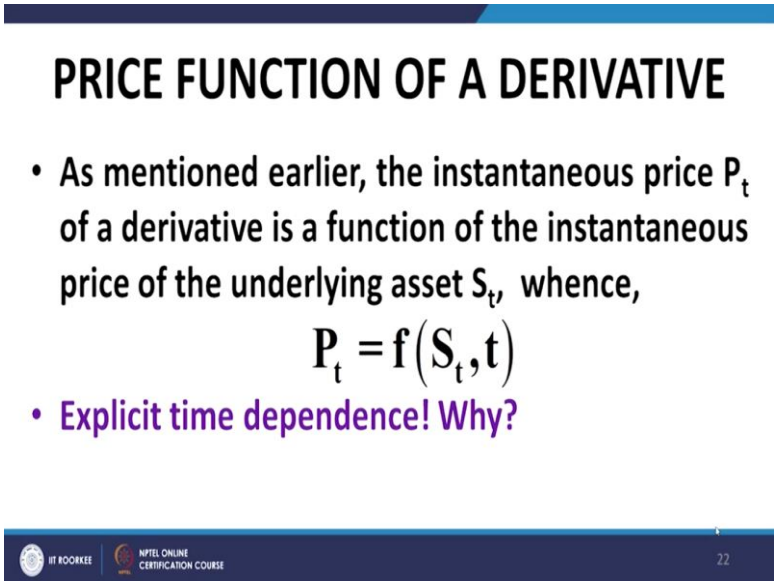

So, the price of the derivative at any point in time, say t, where t is in any arbitrary point in time, can be written as a function of S_t. These symbols are commonly used. So, they shall be used throughout this course. S_t is the instantaneous price of the underlying asset at time t and t is an arbitrary point in time, at which we are trying to price the derivative.

So, the price of the derivative P_t is a function of the price of the underlying at that point in time and it is also an explicit function of time. I will come back to this point. Why this explicit functionality of time is included in the definition of the price. Well, there is a reason for this and the reason for this is here.

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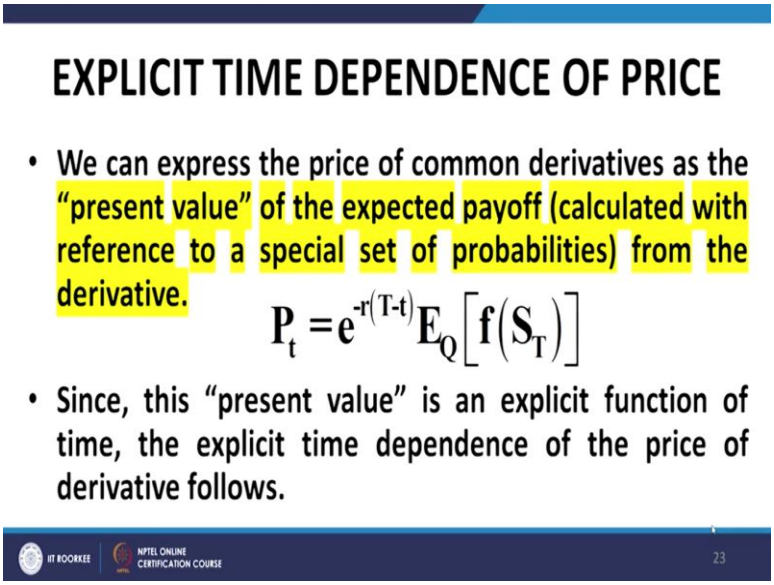

We obtain the value of the derivative by discounting (that is working out the present value) of the expected future cash flow arising at the maturity of the derivative contract. That expectation value is calculated with respect to a set of probabilities, which are known as Risk Neutral Probabilities. A slightly technical definition let me repeat. The price of a derivative at a given point in time is the present value of expected future cash flows that arise from the derivative on the date of maturity of the derivative, that expected value being calculated on the basis of a special set of probabilities, that special set of probabilities is known as the Risk Neutral Probabilities.

Now, because, when we calculate present value, we always use time (we have to come backwards from a future date to the present date by discounting i.e. by the process of bringing back the cash flows from a future time point to the current point in time, which involves obviously, the use of time) and therefore, we have to use time explicitly while defining the price of a derivative contract.

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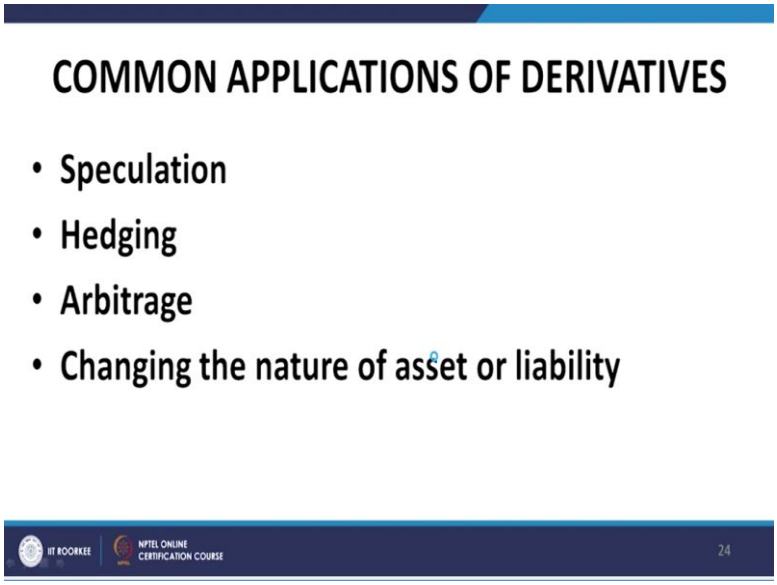

So, common applications of derivatives are speculation, hedging, arbitrage, changing the nature of asset and liability. I will explain them briefly but after the break. Thank you.