Management of Fixed Income Securities

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Module No # 06
Lecture No # 26
Short – Term Government Bond Markets

Good morning and welcome back so after the discussion on the different characteristics of the bond and as well as the bond risk we can; now discuss about the different types of the bond markets which are prevailing in the different economies. Particularly we are talking about from an emerging perspective like India, and as well as from a developed prospective or developed economy perspective like U.S. Because the importance of the bond market is already we have discussed.

But the question here is that, what are the particular type of securities, or particular type of bonds and what are the trading procedures, and how the particular bonds are issues so all kinds of things are quite important. Whenever we try to invest in the bond market or we try to minimize our risk using the bond as one of the instruments in our portfolio.

So today we will be discussing about the short-term bond markets particularly the government bond market. Then gradually we can move forward to the corporate bonds and the municipal bonds then the other type of bonds which are also traded in the different type of markets as a part of the debt market instruments.

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So today will be covering up two things; one is your treasury bills which is the most important instrument in terms of the short term government securities, then the another one is the cash management bill which is also used as one of the bond market instruments in India. So these are the broad two concepts what we are going to cover in today's class.

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Then you will come across certain keywords; like your strip bills, Treasury bill yield or the other name of that thing is also we call it the banker's discount yield which concept is used in the U.S market. But Treasury bill yield is the most common concept always we come across are always we use whenever we discuss about the treasury bills market.

So before we discuss about the characteristics of the Treasury bill and as well as the how the Treasury bill yield is calculated.

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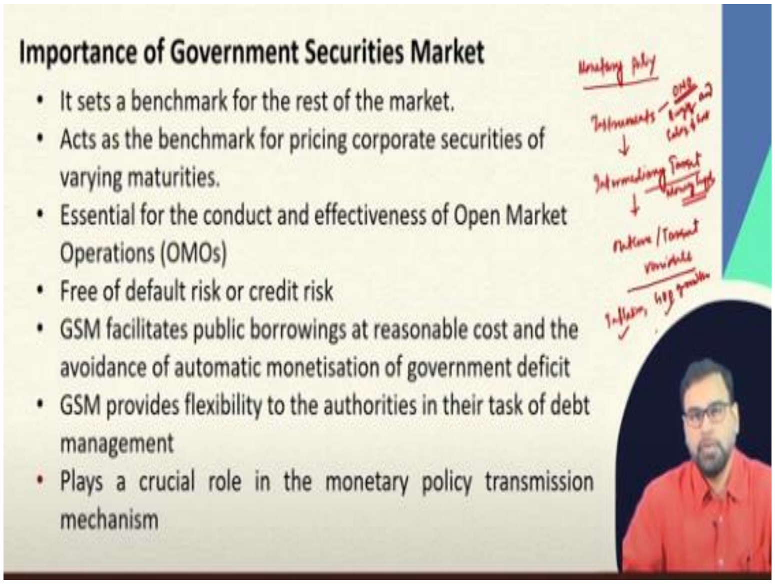

Let us see what is the importance of the government securities market, why you think that the government securities market is quite important? If you look at, the actual figures particularly from the Indian perspective. You will find that whenever we talk about the bond market, the bond market is largely dominated by the government securities market. The corporate securities market is not that developed.

Not only in India across the globe if you find that always the government securities market importance is quite more in terms of the volume or in terms of the uses, in terms of the issuance all kinds of things in comparison to the corporate bonds. But why that happens, you see first of all; all of us know that the government security market is a type of market which is a risk free market. Or we can say that whenever anybody invests in the government securities, then the return is achieved.

So in that case whatever yield we can get or whatever pricing we try to determine with respect to the government bond market that can be used as a benchmark for the rest of the market. So the yield curve whatever we are deriving in the bond market particularly in the government securities market that can be used as a benchmark yield for the other type of bonds, which are issued in other segments like the corporate debt market and the other markets.

So that's why first of all whenever we price the security we can use this particular kind of yield what basically we get it from the government securities market as a kind of benchmark. That is the most important thing what basically you have to keep in the mind that is number one. Number 2 already we have discussed about the open market operations to control the money supply.

The central bank on behalf of the government tries to use the government securities or try to sell or buy the government securities depending upon the requirements, and here if you see that the most important kind of instrument as a part of the monetary policy we can say that. That is basically, your buying and selling activities of the government securities because that is in the control of the monetary authority.

So to increase or decrease the money supply they can take the help of the different instruments which are available in the government securities market. And already I told you that it is totally free of default risk or the credit risk; because government is the backup of this particular security. Then the probability of default from the issuer perspective is completely nil in terms of the government securities; so that's why the reliance on this particular security is quite high.

And another thing you also keep in the mind it is a part of the SLR instruments. The short term government securities are part of the SLR instruments. SLR means the statutory liquidity ratio; what the commercial banks has to maintain. That means the certain amount of securities whatever they have, they have to invest in the highly liquid instruments and also to some extent we can say that the risk-free instruments.

And if you consider the risk-free instruments and in terms of liquidity always give high rating or high weightage to the securities which are issued by the government. So that's why the government securities market is quite relevant quite important from the commercial bank perspective also because; if any commercial bank wants to invest more in the government securities they fulfill the regulatory requirement in terms of the SLR requirements. So that is another importance what basically you can consider as a part of the government securities market.

The government security market also facilitates the public borrowings at a reasonable cost and avoidance of the automatic monetization of the government deficit. Although this particular automatic monetization of the government deficit has been abolished; since 1997 in India this particular automatic monetization of government deficit has been abolished. Now if the government wants to finance the deficit then they have to sell the government securities.

And whenever they are buying or selling the government securities in the market basically they are dealing with the public borrowings. So they have to raise the money from the public or they have to inject more money which can go to the public through the different financial intermediaries, and those financial intermediaries are basically the commercial banks largely.

So that’s why any kind of borrowing activities which is happening in this particular market, or any kind of activities which is related to the government borrowings that always we can say that carry through, or carried through this government securities market only. So that’s why it basically provides flexibility to the monetary authorities for the proper debt management. So the debt management office of the central bank basically manages this operation, so lot of flexibility you can get if your government securities market is quite developed.

So that is why a liquid government securities market is very much important from a country's macro-economic policy perspective. So the monetary policy operations and as well as the public debt or public borrowings what activities generally happen in the market that always down through this government securities market; that’s why it is quite important from that perspective.

Then already I have discussed with you it basically plays a crucial role in the monetary policy transmission mechanism. You know what monetary policy transmission mechanism is. You know, whenever you talk about the monetary policy. Let me tell you what exactly this transmission mechanism is, whenever you conduct this monetary policy, the monetary policy has 3 steps.

So first of all certain instruments are used and these instruments will have the impact on some intermediary target; and finally it will affect the outcome or the target variable. So here what is the instrument here the instrument is basically we talk about the open market operation in the context of the government securities market, so buying and selling of the government securities.

So that will have the impact on the money supply, so money supply is the intermediary target. So if they want to reduce the money supply they will basically use a different instrument in terms of the open market operation, or they want to increase the money supply they take the different position in terms of the open market operation. So the money supply gets affected it will have the impact on the outcome or the target variable; and the target variable is basically your inflation and GDP growth.

So whenever the central bank on behalf of the government, selling or buying the government securities it will have the impact on the money supply. So if the money supply gets affected then this increase on the decrease of the money supply will have the impact on the inflation and the GDP. So that is the one of the channels. So there are various monetary policy transmission mechanism we have an equity price channel, we have exchange rate channel, we can say that bank rate channel, or maybe the bank credit channel what we call it.

So there are different channels and this is the fundamental concept with respect to the process of the monetary policy or monetary policy operating procedure. And here the government securities markets play very significant role in terms of this particular operations. So that’s why the government securities market we can say plays a very significant role in terms of the monetary policy effectiveness; or monetary policy operations; or monetary policy transmission mechanism for any country.

So these are some of the important issues what basically how to keep in the mind to establish the relevance or the importance of the government securities market for an economy; and already we have discussed that this market is quite developed in comparison to the other debt markets or the bond markets which are prevailing in the system.

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Now let us see what are the different types of short-term securities the government basically issues? Whenever you talk about the short-term government securities in India from the emerging market perspective, already I told you that the most important instrument is the treasury bills**.** And another instrument is basically cash management bills. If you talk about the developed economy like U.S also they are also mostly relying upon the treasury bills.

So we can say that Treasury bill is the most important instrument in the short term government securities market. So what basically we have to see or we have to discuss about the characteristics of the treasury bills; how the yield of the Treasury bill is calculated. And further in the other sessions we will discuss about the issuance procedures of the treasury bills; how the treasury bills are issued, what is the mechanism basically we use whenever we try to issue this treasury bills in the market.

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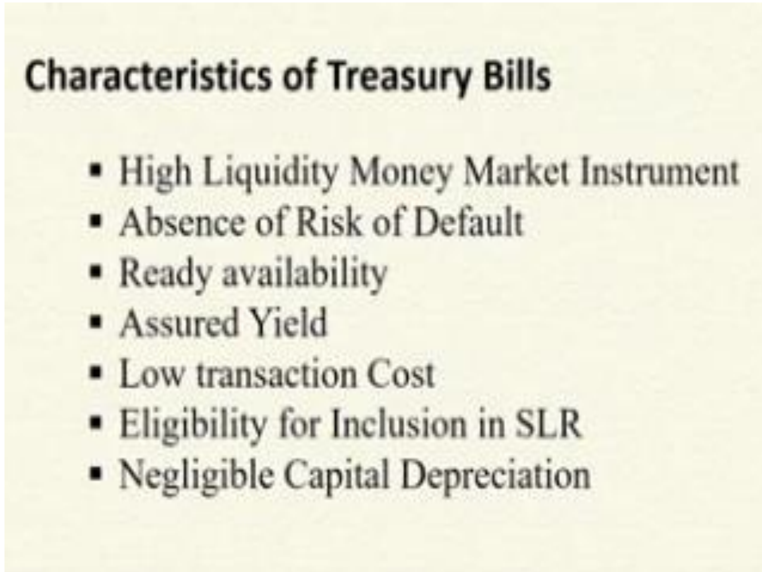

So now you see that what the characteristics of Treasury bill. Already we discussed about the importance of the government securities market from the both short-term and long-term perspective. You see already this is a highly liquid money market instrument, why we call it as a money market instrument? Because, it is very short term in nature, the term to maturity of the treasury bills is not very long.

So that’s why already all of you know that if you categorize the market in two parts in terms of the maturity period we have a money market, we have a capital market. And money market generally deals with the all those short-term securities; and this capital market generally deals with the long term securities. So the treasury bills are a highly liquid money market instrument. It has high liquidity, because it is very easy to convert the treasury bills into the cash.

Liquidity means how easily or how fast these particular assets can be converted into cash that basically measures the degree of liquidity; that’s why the money market is highly liquid number one. Number two already like other fixed income securities which are traded in the government securities market it is also there is absence of the risk of default. The credit risk of the treasury bills is basically zero.

Another importance is ready availability because there is a regular basis the monetary authorities issues the treasury bills and when they are going to issue the treasury bills there is a calendar basically they maintain, so there is a ready availability. So at any point of time the treasury bills can be available by the commercial banks, for the commercial banks, and other financial intermediaries who are eligible to borrow the money from the central bank; and finally this come to the public for the investment.

Assured yield: - the yield is basically very much assured in nature whenever we are investing in the instrument like treasury bills; and it has low transaction cost. Investment in the treasury bills in does not incur very high transaction cost that’s why it has a low transaction cost. And in the beginning I told you it has the eligibility for inclusion in the SLR. Whenever the commercial banks invest in the treasury bills this can be considered as a part of the SLR instruments.

So that’s why it has the eligibility to be part of or we can say that as a component of the SLR instruments what the government basically defines. And finally it has negligible capital depreciation, why basically it has negligible capital depreciation; because the treasury bills basically are always issued at a discount and redeemed at par.

The treasury bills are issued at discount and redeem at par so because of this you will find that you will not find much capital depreciation, if you are investing in the treasury bills. So that is another thing basically you have to keep in the mind. So these are the different characteristics you have to consider whenever we are investing in the instrument like treasury bills.

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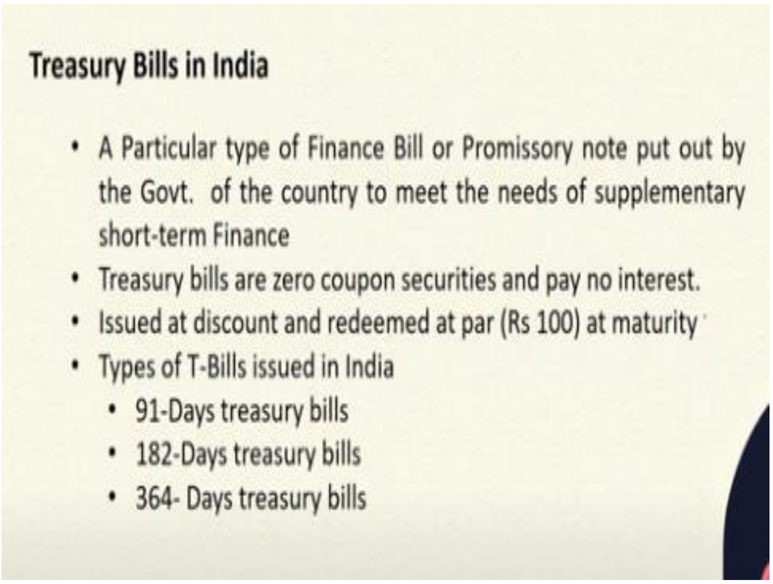

Then let us see about the treasury bills in India. So whenever we talk about the treasury bills in India already we know that what exactly the Treasury bill is; Treasury bill is a kind of finance bill or a promissory note which is put out by the government of the country to meet the needs of supplementary short-term finance. If there is any kind of deficit by the government, they can take the help of the treasury bills to financing that deficit.

So on behalf of the government generally the central bank of the country issues these treasury bills. If you talk about India the reserve bank of India basically issues this treasury bills. And already all of you have the idea that treasury bills are zero coupon bonds because it does not pay any interest in between. There is no periodic coupon involved whenever you are investing in the treasury bills, so that's why the treasury bills are zero coupon securities and pay no interest.

So it is basically issued at discount and redeems at par at the maturity, so generally the par value of the security is it those 100 rupees. Let if it is issued at discount that means the issue price should be less than the par value, so then, let it has been bought at a price of 97 and sold and the maturity basically it will pay you that 100 rupees.

Broadly there are three types of treasury bills which are traded in Indian market, treasury bills market we have 91 day treasury bills, 182 days treasury bills, and 364 treasury bills. So these treasury bills are characterized or classified on the basis of the term to maturity. So these are the 3 types of treasury bills what you will find in the Indian short term government securities market.
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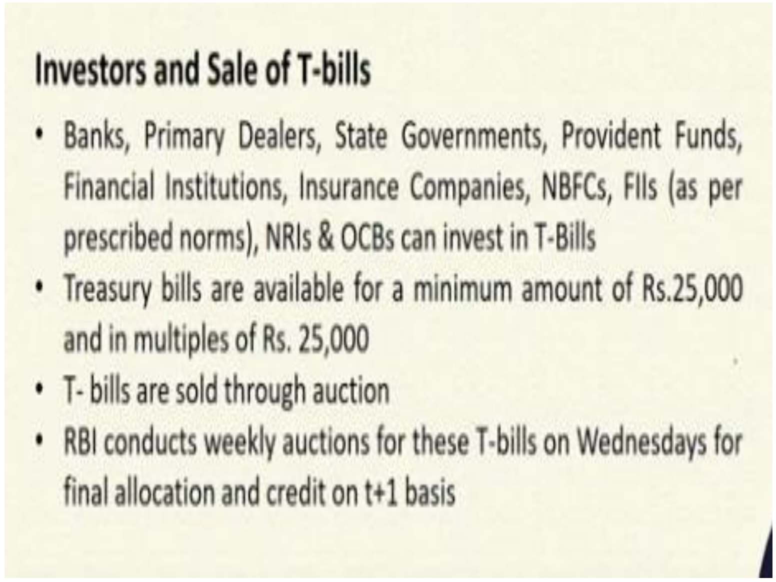

Then the question here is that, who are those investors. Generally the treasury bills are sold by the central bank on behalf of the government of India. And who are investing, who are buying it can be bought by the commercial banks, primary dealers which are basically identified by the central bank; who are those primary dealers, then you have the state governments, provident funds, other financial institutions, insurance companies, non-banking financial companies, FII or foreign institutional investors also are eligible to invest in the treasury bills.

But there are certain kinds of restrictions, certain kind of guidelines for time to time the reserve bank of India always formulates that they have to follow that. And NRI’s also can invest in the treasury bills, so these are the different investors who are available who are eligible to invest in the treasury bills market. And the treasury bills are available for a minimum amount of 25,000 or a multiple of 25,000 that actually you have to keep in the mind.

And how the treasury bills are sold or it generally these are issued; these are basically sold or issued through the auction process. We will discuss about the auction process further what basically the auction process is, what are the different types of auction process, and how the yield of that particular securities are decided through that; that basically we will discuss further,

So reserve bank of India conducts the weekly auctions for the treasury bills generally on Wednesday and the settlement or the allocation generally is done on the t + 1 basis. Generally the auctions are conducted in the Wednesday days and the final allocation journal is made on the t +

1 basis. So this is about the investors who are basically are allowed to invest in the treasury bills market in India.

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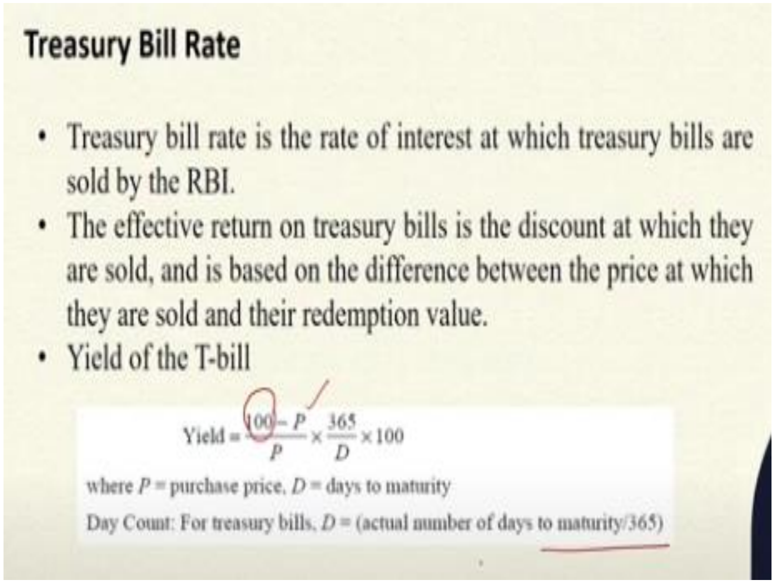

Then how do Treasury bill yield is calculated, or what we call the Treasury bill rate? Already what do you mean by this it is basically the rate of interest at which the bills are sold by the reserve bank of India. So how this particular interest rate or the return from that particular Treasury bill is calculated? So this is basically nothing but or the effective return on the Treasury bill what basically we are trying to calculate it is nothing but the, or it is calculated on the basis of the difference between the price at which they are sold and their redemption value.

At what price the particular security was sold to the investors and what is the redemption value of that particular security that will basically decide, or that will basically the basis for the calculation of the Treasury bill yield. So what is the formula here for treasury yield already you might have seen that is this 100 rupees is the maturity value or the redemption value - p divided by p into 365 by d into 100.

$$\text{Yield} = \frac{100 - P}{P} \times \frac{365}{D} \times 100$$

100 is multiplied to calculate or to convert it into the percentage, so p is the purchase price, and your d is the actual number of days to the maturity divided by 365. We are talking about the day count convention here that is actual number of days to matuity by 365.

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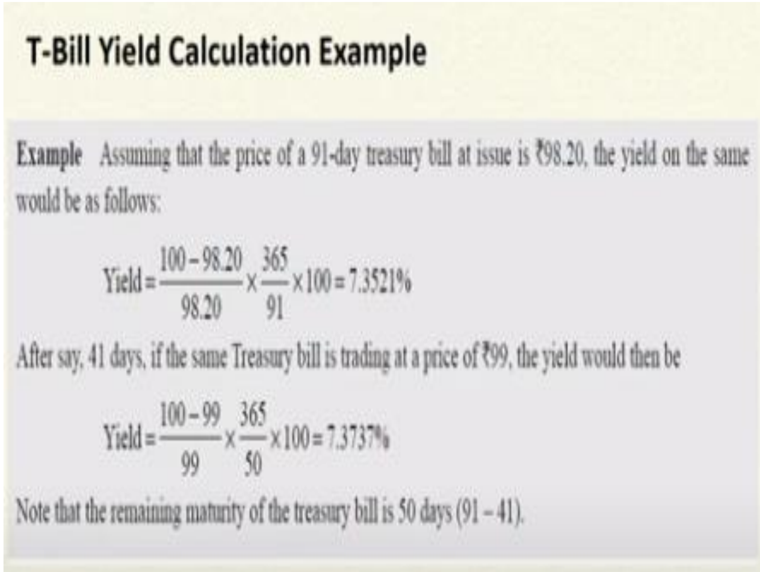

So if you if you take an example how it is calculate assume that; there is a 91 day treasury bill which is issued at let 98.20; then what is the yield then your redemption price is 100 – 98.2 divided by 98.2 into your 365 by 91; d = 91 because term to maturity is 91 into 100 that is 7.352%.

$$\text{Yield} = \frac{100 - 98.20}{98.20} \times \frac{365}{91} \times 100 = 7.3521\%$$

So in the market right after 41 days if the same treasury, bill is trading at a price of 99 then what will be the yield?

$$\text{Yield} = \frac{100 - 99}{99} \times \frac{365}{50} \times 100 = 7.3737\%$$

Yield will be already 41 days are gone so 50 days are remaining so if you are trying to calculate the yield it will be 100 - 99 divided by 99 into 365 by 50. 91 - 40 that will be 50 into 100 that has become 7.373%. So that is the way basically the yield is calculated and the day count convention is actual by 365 days.

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Let us see about U.S markets some facts about the treasury bills market in U.S. The same thing the treasury bills are short-term instruments sold on a pure discount basis in a multiple of 1000 dollar, the 1000 dollar is the par value of the treasury bills in the U.S market. And the interest on the treasury bill is the difference between the face value and the price paid. And what are the maturities available in the U.S market that is basically the 13 weeks or 91 days; or 26 weeks is 182 days.

These are the 2 major types of treasury bills which are traded in the U.S market and they are sold weekly basis, but regularly they are basically sold to the investors in the weekly basis but regularly. The treasury of the U.S market also sells some special type of t- bills on an irregular basis that is called the strip bills. The strip bills, means this is a package of the treasury bills with the different maturities in which the buyer basically agrees to buy the bills at their bills price for several weeks. So that is a kind of special type of t- bills which are issued in the U.S market that is called the strip bills.

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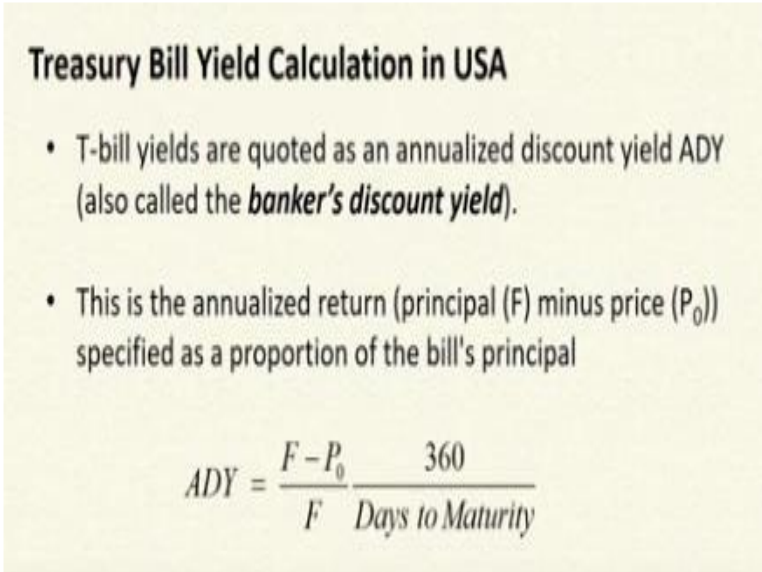

So in U.S whenever we calculate the treasury will yield it is always quoted as an annualized discount yield and it is also called the banker's discount yield. But here you if you see that is basically little bit different is that is F – P_0 divided by F into 360 by days to maturity. Here 30 by 360 day count convention is used whenever we are calculating the yield of the treasury bills in the U.S market right.

$$ADY = \frac{F - P_0}{F} \frac{360}{\text{Days to Maturity}}$$

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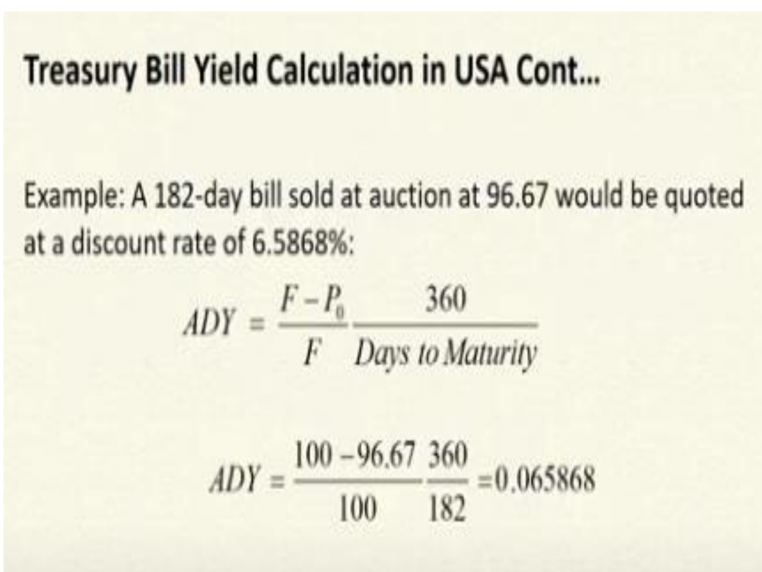

So if you see this example let a 182 days bill sold at auction at 96.67 it will be quoted as a discount rate of 6.5868%, how you got it that is 100 - 96.67 divide by 100 into 360 by 182 that is 0.065868 that means 6.5868%. So that is the only difference what you can observe between the treasury bill yield calculation in the context of U.S and in the context of India.

$$ADY = \frac{100 - 96.67}{96.67} \quad \frac{360}{182} = 0.065868$$

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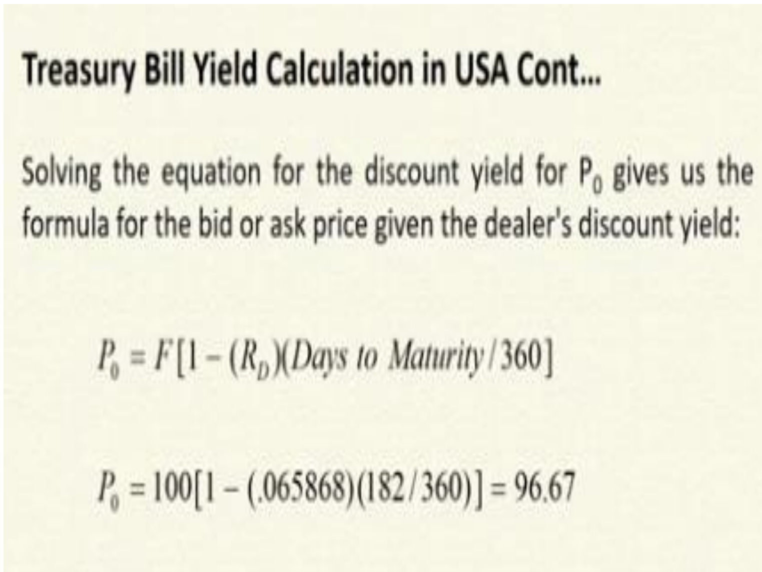

So from this you can calculate also the price if you know the yield then the price also can be calculated from this. Then your P_0 is equal to 100 into 1 - 0.065868 into 182 by 360 that means your days to the your what is the yield you are calculating that 1 - the yield that is r d into days to the maturity that is 182 divided by 360 that exactly you get it 96.67.

$P_0 = 100\ [1 – (0.65868)\ (182/360)] = 96.67$

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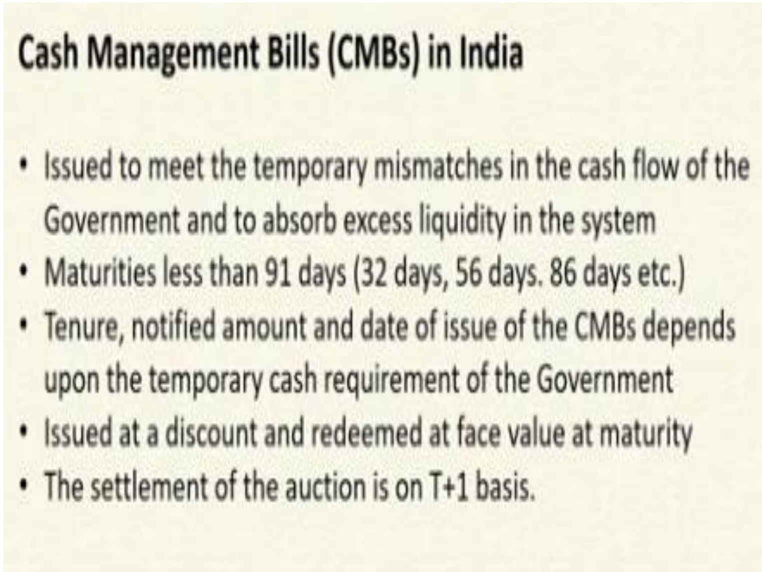

So then the cash management bill; the cash management bills in India basically it is an instrument in India this is issued to meet the temporary mismatches in the cash flow of the government and to absorb the excess liquidity in the system. And the maturity period is basically less than 91 days; that is 32 days or it can be 56 days or 86 days like that. So the tenure and the notified amount and the date of issue of the cash management bills generally depend upon the temporary cash requirement of the government.

When the government needs this they can use this cash management bill. And again it is issued at discount and redeemed at par. And the settlement of the auction of this cash management bill is basically on the basis of t + 1. So that is a basically a kind of temporary instrument, what basically used by the reserve bank of India to match this kind of cash flow of the government, whenever there is a requirement.

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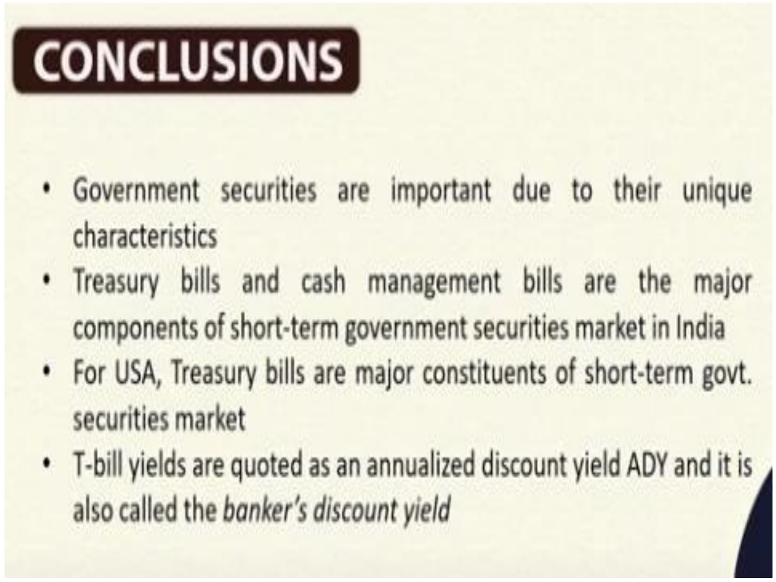

So what basically we discussed today the government securities are quite important due to the unique characteristics like risk of default, case and as well as the important instrument of the monetary policy and all kinds of thing. And treasury bills and cash management bills are the major components of the short-term government securities market in India.

For USA the treasury bills are the major constituents of the short term securities market and t-bills or t bills yields are quoted on an annualized basis and it is also called the banker's discount yield. So these are the things what basically we have or discussed in today's class.

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So you can go through this, references to know more about or the more details about the treasury bills market in India and the U.S.

Thank you.