Money and Banking
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Lecture - 24

Now, what we had is we went till CP, I think we went till commercial paper and I showed you a first diagram of CD and CP how different it is today.

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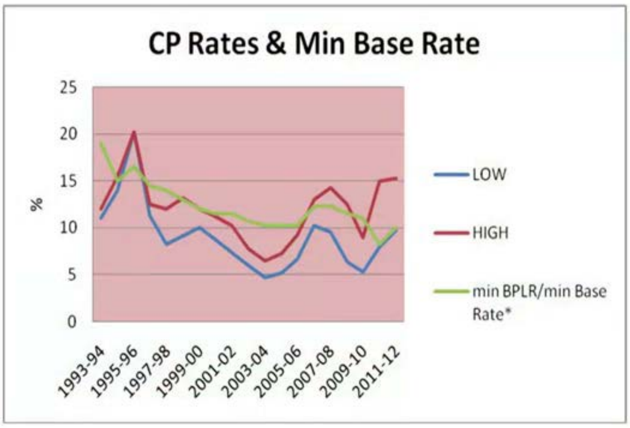

Figure III.5

After that, I went to CP rates there is a low rate and high rate every day; there is a low rate and high rate at then of every month and you can calculate that and then at end of every year creating a base price or whatever on average. Now, I come to CD now. Look at the CP rates they had a hump there is a hump around 94, 95. Hump 94 95 hump then it came down 95 96 it has been coming down, recently past few years again it has a tendency to go up, it is a one year it fell, one or two year it fell. Two years it fell from 2007 8, 9, 9, 10 again 10, 11, 11, 12 they are going up, this is a CP rate

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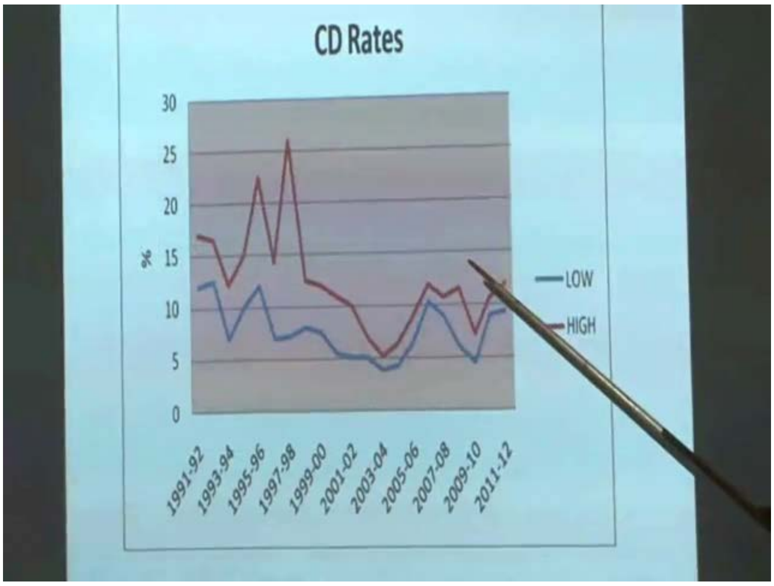

Now, look at the CD rate, there are few spikes right in the beginning of this data period around 95 96 then 97 98. Two spikes are there CD and they have come down and what you see is the low and the high are nearly equal, and they are going up this part is similar to the CP go back to the previous diagram it is very similar to the CP going up and down again. So, the markets are behaving more or less same in the recent years all right there is one down swing and then going up like a business cycle.

The point why I am making this is that often it is said the CP and the CD markets are very similar they were, they have a similar features if you look open your note you will see that. The reserve bank guide lines are very similar not if not exactly saying similar the main important the most important difference is the CP is the sold by one group of we cannot make what difference from the CD sellers CDs are mainly banks and some non banks the CPs are companies and financial companies also there, yes non banks can be there.

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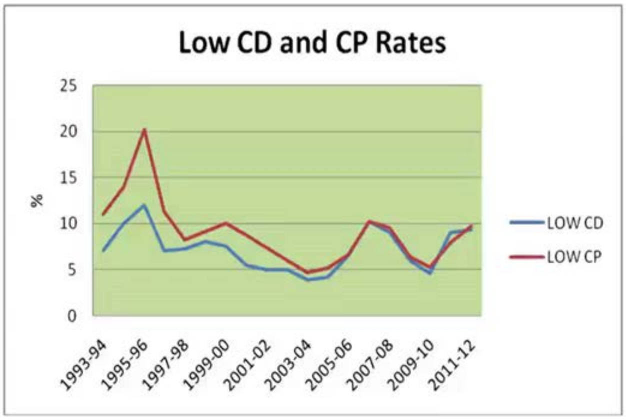

Figure III.7

Now, often they are compared with each other. So, the rates are like this. So, what I did if there are compare now I did individual comparison. First, I took the low CD compare it with low CP do you see one thing the last few years they wherever they are moving like you know the twin brothers the very closed to each other. Low low values the keep people say they are similar they are two markets they are similar which is did not clear for the previous diagrams.

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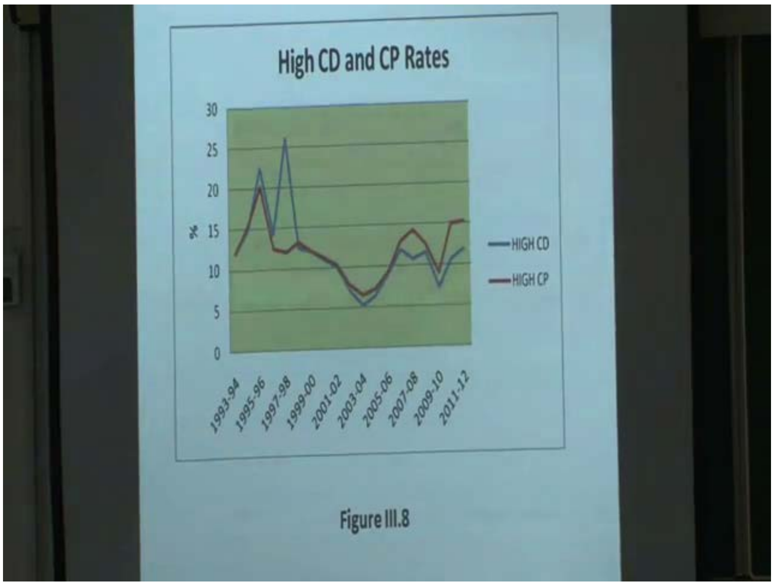

Now, look at this plot the next plot the high very similar except there is a reference coming in the CD rate sorry the CP rate CP rate is higher than CD, which says that, the companies are finding it costlier to borrow money and this is way the criticism is presently that you are chocking of investment with the kind of the policy you are having in the country. You have your chocking of investment and companies are finding it very difficult to they talk about subdued private corporate based or what we called business investment then they talk about rather kinds of investment in substitute like residential investment, then you have these banks interest rates are generally being very high and you have high CRR.

So, naturally if high CRR is there banks would automatically charge a high loan rates because high CRR means what if banks are profit maximizes if you are going to take away their money base and put in the reserve bank they would try to make as much as possible from the remaining amount. So, this supplies reduction creates the higher interest rates also the loan rates are often high.

So, there is a complaint presently in Indian economy the context of Indian economy the micro economic policies particularly Monterey policy the way they have been persuaded by RBI is not good for private investment. Now, here you can see the last few years the high CP has remain above CD is not the low values so much. The low values are like really very close to each other, but the high values a slightly different. Next is the blue line is the CD line, red line is the CP line is that clear.

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Table III.7
(Year End) Outstanding Amount of 91-Day TBs and
Year End Implicit Yield at Cut-off

Year	RBI	Banks	State Gov	Others	Foreign CBs	Total	Implicit Yield
1996-97	1468	2365	1262	605	0	5700	7.9551
1997-98	627	29	530	95	319	1600	7.332
1998-99	224	827	0	249	200	1500	8.7472
1999-00	288	557	0	455	220	1520	9.1653
2000-01	67	868	0	153	630	1718	8.4967
2001-02	154	2292	450	360	1301	4557	6.1326
2002-03	0	6427	800	780	700	8707	5.8853
2003-04	0	3948	600	1452	39	6039	4.2446
2004-05	0	21176	1755	4829	32	27792	5.3653
2005-06	0	5943	9762	576	37	16318	6.1081
2006-07	0	12684	24250	6743	5	43682	7.977
2007-08	0	6057	23825	10075	0	39957	7.2274
2008-09	0	49914	544	25092	0	75550	4.9538
2009-10	0	30875	0	40628	0	71503	4.3792
2010-11	0	23560	11590	34450	0	69600	7.3105
2011-12	0	48820	21590	50050	4160	124620	9.0227

Now, let see what are the diagram? Now I come to treasure equals now this is the table and the last is the called the implicit yield. Yield is yield to maturity kind of number at the selling point of these bills. Yield is the implicit yield is a way is formula is slightly complex then the formula I have shown you yield to maturity YTM. It is the yield that cut off at which these bills discounts bills are sold. Treasury bills are discounts bills essentially they sold at a discount. Now, if when I look at RBI tables they are saying the price at cut off, cut off means when they are optioning there is a point where they says that is it, this is the price you are going to accepts when you are going to buy or invest in treasury bills I am RBI selling treasury bills you banks are have come to buy them treasury bills.

And other is an auction going on I explained this into you in class there is an auction going on, and then there is a cut off when we finally, accept the price. As soon as you accept the price you can also calculate given the life of the treasury bill the yield, implicit yield because you remember that formula price is equal to the written; the coupon payments on a bond divided by the yield to maturity the discounts factor.

So, immediately using an equation like that you can find out, the yield equation RBI uses for governments bonds or government uses is slightly different is much more complex I have seen that expression algebra at one place I just do not have it here. Broadly, that concept is a same thing the yield. Now, what you see here when if significant why have this table instead of a diagram I will show the diagrams this is the ninety one date treasury bill you are talking about I have data here form 96 97 to 2011, 12 which is how many years it will be 15 years roughly, 15 years or so.

Now, initially early 90s mid 90s until the century beginning of the century 2001-02 the first the second column you see a number of zeros values persisting. This is very significant; that means, what is happening when government is announcing sale of 91 day treasury bill and buyers if those bills who are called investor are coming which are banks and some state governments you can see what the buyers, banks, state governments, others. They can be other institutions, non banks, foreign central bank, they also can buy china banks US Treasury bill this is the common practice you in you can buy one government or one central bank or bank of a country can buy other governments treasury bills.

Same thing is happening with respect to Indian treasury bills and then you have the total. What do you see here is very interesting, that the RBI column is showing zero values and some foreign central banks also shows some zero values you can see there number of zero values in one zero values in case of state government which is the year 2009-10 as a zero value two thousand eight nine decision came state government did not have any funds probably they hate them. So, within the year what do you find state governments did not invest anything in state government, central government treasury bill. They do not have surplus cash, many state government rather than deficit some state government have surplus.

Now, RBI zero column is very important. This talk about this essentially implies that the RBI has no devolvement issue any more with 91 day treasury bill. Because, 91 day treasury bill would come with a total package in terms of the value or amount that the government needs cash for that amount of cash they are going to sell treasury bills. Now, devolvement issue came, use to come earlier when the buyers have come and they have bought whatever they want to, but still it is not sufficient from the point of view of what government wanted the amount of cash.

So, what would happen with the remainder, the balance. The balance used to be RBI revilement meaning RBI will have to buy it. No choice. All right is like this is very, very unfortunate it is like say, there is some work in office all right, now there are five people who are given to freedom to do work whatever they want to do and after they have worked they have gone. They have done their work, their share or whatever there is not fixed share probably there is something that remains ultimately is the somebody's headache some manager or a boss who will have to sit if require the entire night and finish that work.

This devolvement is now gone meaning what the market is more free, more open the banking system, the monetary system has more cash and whenever government is selling ninety one day treasury bill RBI has no devolvement issue. Everything is sold off. So, suppose I open my shop selling something, all right I need not worry like a vegetable market seller. He has pluck those vegetable he has a devolvement issue there. He is a very, very difficult situation can arise vegetables are perishable goods.

So, he comes to the market, but he cannot sell the entire amount what will you do with it. He cannot eat the entire amount, he will try to sell them off at a throw away price because they would lost this often happens. So, in case of devolvement RBI revolves us to mop-up the remaining ones that is why I have the table. Now, (( )) no it was earlier sold on tap yes that has been converted into adopt wheels to the fixed return I told you they were converted on tap this this was converted into a fixed premium console, like saying where RBI has not promised or government has not promised when they would redeem them. Redeem means what, redeem means buy them back end the term they are become console on tap is not there anymore.

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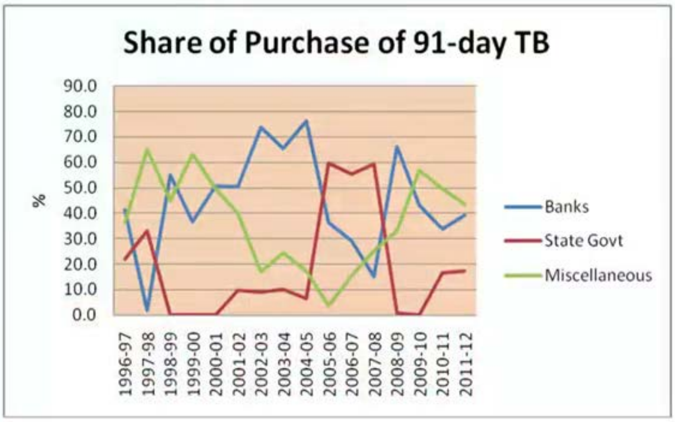

Figure III.9

Now, here I have this line which of course, is very messy it does not say anything the the most dominant ones, what do you see here is essentially the blue line the bank line is important in terms of percentage buying of government 91 day bills. And what are the other two rise the red line is the state government another important buyers and miscellaneous means everything I put there whoever outside the state government and the banks. One thing is very interesting the bank line dipped a lot when did the bank line dipped.

The bank lines started dipping in terms of percentage buying of treasury bills which is very significant because this is the captive market I would explain that of the government treasury bills. Why is the captive market, banks have some obligations like SLR which is coming up in the next topic. In SLR you have to show to the RBI just like CRR you have to show to the RBI, so much of bills you have. Now if you make a compulsion or compulsory thing for bank to show how much of you have invested in bills and treasury bills are one of them. Then like CRR which you have to report every week if SLR has to be reported every week with bills investment they are forced to invest interest.

Now, therefore, RBI or government has been very clever by making this rule whenever now government needs money it sell bill, banks would immediately come because banks know they have SLR requirement let them buy it is very safe, risk free these bills are. So, if we buy them we do not have any default or kind of possibility. Second, we will have to we require them for the SLR. So, it is not only good investment we also need them for SLR. But, very interestingly enough I don’t know why the blue line went down and the state government line went up at the same time percentage wise it is out of hundred. Around nine to 2005 2005-06 from 2005-06, 2006-07, 2007-08 and then after 2007-08 again 2008-09 it has been going up.

So, what does it signify that this four years 2005-06, 2006-07, 2007-08 it went down bank investment purchase of 91 day bill what was banks doing; that means, banks had alternative avenues to make money. And already they had enough bills other kind of bills may be enough bills. It can be also commercial paper it can be CDs whatever for commercial bills also some commercial bill, first class commercial bills like Tata’s commercial bills which can be used for SLR and they also can use semi government organization bills, bonds for instance state electricity bonds railway bonds they and use them. Here India sells some bonds tomorrow they can use that, just not government semi government organization bonds.

So, that means the economy there were more opportunities to invest. So, it went down the economy was doing well actually the banks share going down the spike been a captive market for government bill going down is a good news; that means, banks had alternative modes of investment and state government purchase means state government have surpluses. So, it make sense the economy was doing well, but then what happen in 2008-09 2008-09 doom.

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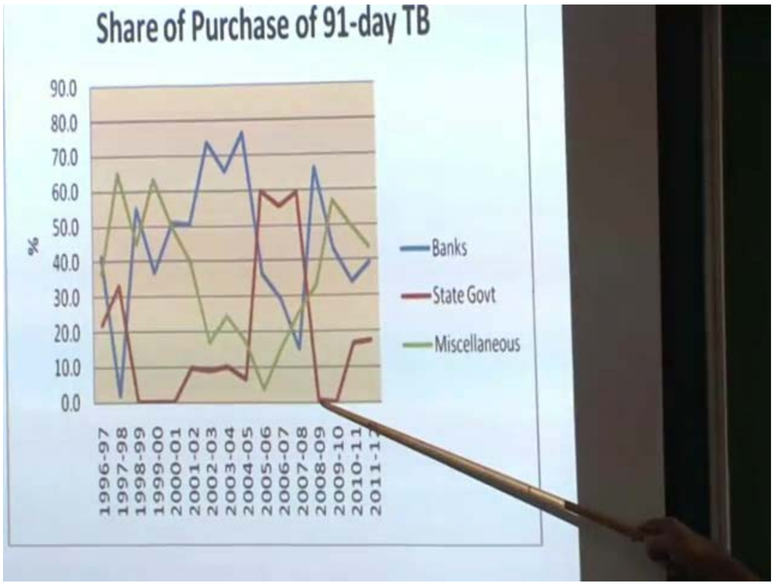

State government surplus gone wiped out who stepped in to buy bills, banks. Now, banks do not have alternative many available, not many companies are selling CPs banks are not lending much lots of cash. So what to do with the cash, go for government bills. It is complimentary it is very complementary and government also need cash economy is not doing well banks have cash a state government red line nearly zero percent.

So, now you understand the whole thing how it is working the system. You understand the system by looking at the numbers it is very clear all the system works for government bills and is also talking about speaking loudly about the micro economy. 2009-10 total amount becomes four times 2000 (( )) total amount yeah six to twenty seven thousand why is it so. Why government require so many (( )) again (( )) eleven and twelve what can happen in 2004 and 05. 2004-05 why did government had to sell so much of 91 day treasury bill. We have to go into the budget of 2004-05 and find out in 2004-05 which is the first year of the UPA government why the government required so much extra funding, although the economy was doing well then. Very good point.

They says an hunting I have to do I can explain today 2011-12 doctor man mohan singh is so panic-stricken in about excess expenditure, he has raised diesel prices he is going to raise the PDA sugar prices by doubling it that was the news yesterday. Because, subsides are costing the government a lot is just not the finance minister doing it, it is Dr. Man mohan Singh is there now, although he is a prime minister he is backed to his old job being the finance ministry economies in such a bad shape which when I started keeping track of Indian economy he was the finance ministry I knew how he acts. He goes into a forth gear mode suddenly, which he did, otherwise the all this things would not happen you cannot do it slowly that is why they have suffer so much they were not doing anything.

So, now the question is now why the government is trying to sell so much of bills I understand because the budget is huge deficit. But, why in 2004-05 I do not have an answer. We have to look into that, it may be some social sector expenses they declared a lot because if you remembered the nrega thing became very important and multiplied with their UPA government. So, the social sector may have required a huge extra amount of expenditure for which despite the economy is doing well it went into a lot of borrowing, this is called borrowing could be. But, I have to check the budget if you can open the budget if you find out the economic survey of 2000 what is the year 2000 economic survey 2004-05 you will find some explanation definitely it is there. Economic survey 2004-05 you open that you get an answer for your question.

Definitely, because economic survey two thousand four five would review the economy till December economic survey does not have the information on three moths of that financial year which is January, February, March. It will be the previous financially years three months, last three months and the nine months of the current financial years total twelve months. Because, it the all the data they get by December all analyzed assimilated and the economic survey in printed form comes out in march or February depending upon when the budget is. So, 2000 (( )) is on ministry of finance site economic survey. If you open that you would get 2004-05 economic survey we will have an answer for what happened. So, this is the situation who knows why I really do not know look at this thing this is a very another interesting information is there this is how you read data.

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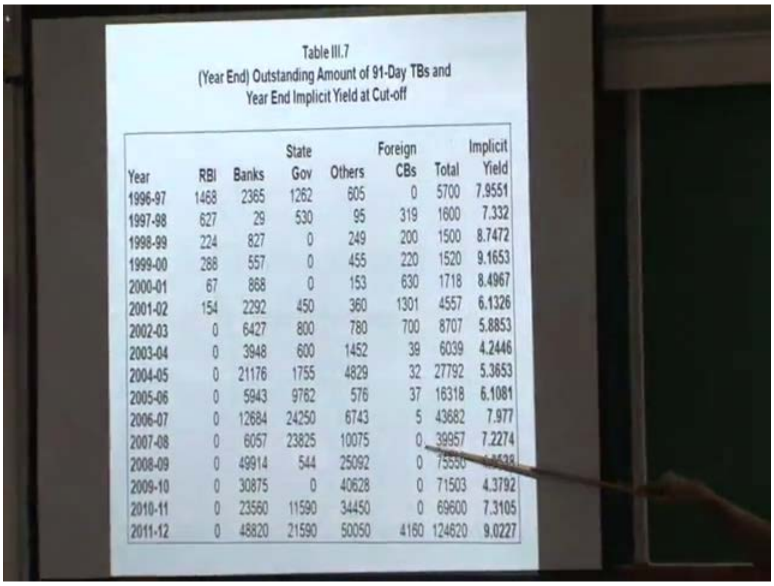

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Look at the foreign central banks since when it has become zero numbers 2007-08, 08-09, 09-10, 10-11 what is it saying, whole economy is in trouble foreign central banks do not have much surplus to invest in Indian treasury bills there is a lot of buying going on. So, some central banks have money. So, which are the economies that data is not available, that detailed data is not available to go to RBI and ask them open your data set and tell me who are the central banks buying your treasury bill now. So, we would know which are the economies in the world are reviving this is how you read the information there is a lot of information here.

I haven’t given you this table instead of a lines the lines are one kind of appreciation you can have the one I had how state bank fail the banks fail buying and the percentage of state government went up and then it reversed what does it mean, why is it reversing. Another information is foreign central banks, another information I told you about RBI zero values.

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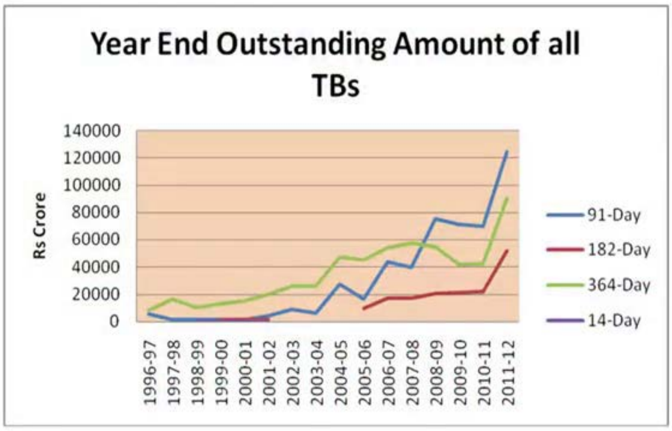

Figure III.10

So, now share are purchase of 91 day bill I have shown that to you year and outstanding amount total value of bills outstanding, means what the new one that you have sold and the old one that has still not been redeemed their life has not ended it is still lying. So, you are you still as a government you still hold public funds, which you borrowed in the past plus the fresh one you got this period in a year by selling new bills, fresh bills and some old bills which have not been redeemed. Redeemed means the life have not ended. You still holding public money you have to return the money.

So, year and outstanding amount do you see here are very significance story which one has taken over. Very important message here, 91 day bill has like a step ladder has taken over look how it has systematically taken over and the green line went down now it is going up a little bit and the red one is going up of course, government is selling a lot of bills deficits government is running at a deficit the selling of bills are going up.

Yes, yes how will it return the money I am going to that death trap this is called death trap that issue I am going to come in a second. But, do you see here the tendency of the government now. It is just not government selling more bills of course, they are going upward if you have a trend line the trend line will show they are going up, the 364 days were going down a little bit and going picking up again last year the red line which is the 182 going up the 14 day bill will not be seen anymore, because it was discontinued after few years.

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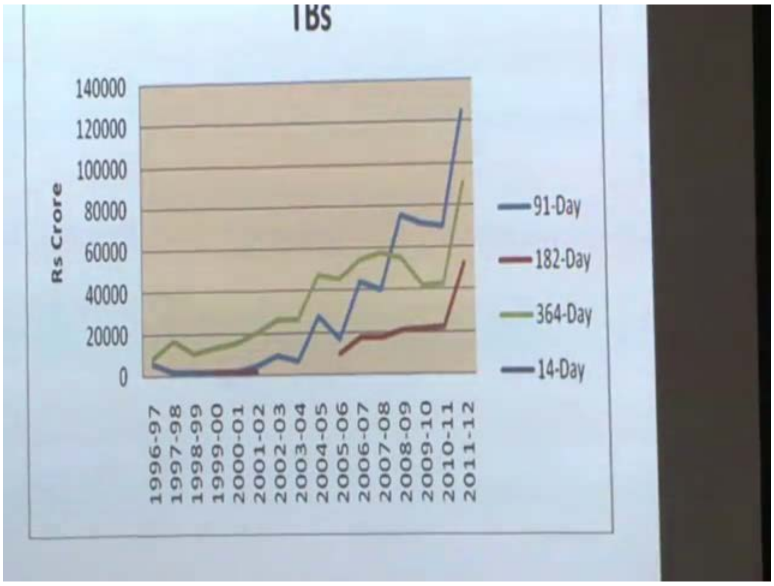

14 days bill 14 day bill the red bill do you see the red line in the discontinuous line in your notes you will find I told you that the 182 day bill was discontinued for a few years. 364 day was brought in, once that certain again the brought back 182 day in your notes you will find that I told you. So, there is a discontinuous red line here, the blue line, the the old best form of bill in India treasury bill ninety one day it is peaking up why is it so. You think the ninety one day is selling more than 364 day. There is people choice also, it is a net market result in a market the net result is the price and the quantity which is brought which is both and sold.

So, it is just not reflecting how much consumer wants to buy it also reflects how much producer want to sell. Together, you have a supply demand frame work and therefore, the net result you get. This is the net result government wants to sell bills, no devolvement RBI the 364 day by definition one eight two day they has no devolvement. Because, they come to the market without government saying how much we want to sell you sell whatever amount.

So, devolvement issue the devolvement issue was there with 91 day and you have seen the zero values there. So, what market has enough liquidity to buy them. The question is what is the net amount final result final amount they have brought what do you see here is the selling of bills in India is the shorter term doing more business the blue line is doing business, then the green line or the red line. So, longer duration bills are selling less, shorter duration bills are selling more right, clear message, why is it so you think. I think the reason is the returns are not very good. So, government or people who have cash parking them temporarily and hoping that another avenue will open up and invest them later there. So, we have to check the returns maybe, that is one of the reason. In economies down is in a recession we do not have many good avenues to invest all right stock market is already uncertain.

Now, government gilt age market is good place to go and invest, but which one should we preferred put a funds for there for one year put off funds for six months or put off funds there for three months, but the preference is among public is three months right now. You can have risk credit morals explaining it financial economics models. This is a classic case of a consumer choice for some products which it is free, but the time duration maturity matters to people. May be not the financial economics model some other model.

This is not a stock market investment, stock market all shares are risky, but which is more risky which is less risky we have (( )) is stocking over a giltage market it is zero risk and the choice is between the terms the [mat/maturity] maturity period of the bill. Should I go for one year investment, should I go for six month investment in government bills or should I go for a three month government bill. It is very interesting they are selecting three month the business is fast pick up a lot.

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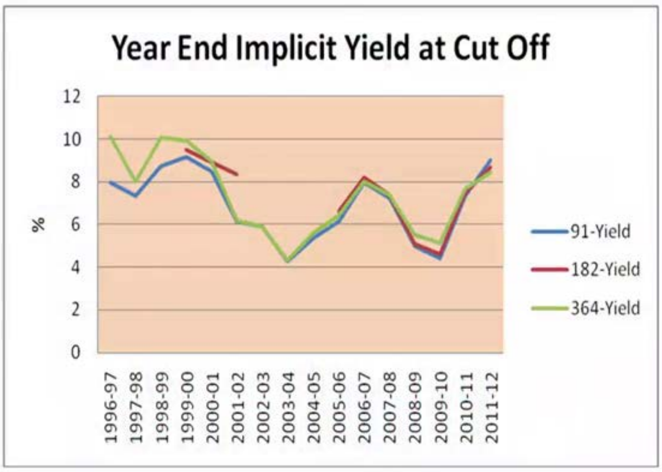

Figure III.11

So, now we need to look into the implicit yield. Let us see the yield the return at this time of at the point of selling the bill, cut off your auction override when there are been auctioned what is the cut off, when there is being option what is the cut off. Look at the implicit yield, is very interesting the implicit is not bad at all. The last few years implicit yield 2008-09 it came down 2007-08 peaked 2006-07 peaked 07-08 it is coming down 08-09 coming down 09-10 it dropped 09-10, 10-11 going up 11-12 going up, last two years going up to implicit yield. Previous to that three years it has steadily for fell last two years it is going up.

Means what, the prices of this is at one thing is two points. The yield is similar number one, very similar. (( )) Implicit yield means that yield to maturity which I told you when you are selling at a price, a instrument which has a more than one period maturity, you have a polynomial from which you can solve for an unknown in the denominator which is the i. 1 plus I, 1 plus i square, one plus i cube that is the yield, yield to maturity. It is sometimes called implicit yield.

But, government has that I definition much more complex, but that is basically the concept is. So, the left hand is p is equal to a polynomial with a fixed value in a numerator may be the phase value of the treasury bill divided by one plus I, 1 plus i square up to maturity. Say, here it would be monthly the time period would be month, three months. So, it 91 day bill would up to three months, only three components on the right hand side. Then six month 182 day will end after roughly six fractions there, on the right hand side and 364 day is roughly one year. So, it will be twelve fractions there.

Now, what do you see despite different maturity, the polynomial degree is different the yield to maturity at a cut off is very similar, unbelievable this diagram. They are moving together, moving up, now when they are moving down means at that time the price at which the cut off took place was high. Now the price is come down and yield has gone up means the investors are buying the bills at a lower price. When does it happens very simple, when the supply is more than demand the supply of this bills form the government side has increased.

Government is requiring more and more cash which is the case where diesel price are going up because government expenditure going up lot compare to the revenue. In a recession in a economy tax revenue would not be increasing so much. We have a growing economy still, s, tax revenues are increase at some rate. We do not pay taxes this the problem the an organization sector does not pay at all, the organize sector does not pay taxes, the government expenditure if they are going up though subsidies and this and that how is going to balance the budget, by borrowing.

So, it seems to be the last two year the government has been selling more, larger and larger amount of treasury bills and therefore, cut off price is becoming lower and the implicit yield is going up. But, very interesting despite three distinct preferences in terms of amounts that the public are buying and the banks are buying these bills which you saw in the previous slide, that the 91 day is selling more than 364 day.

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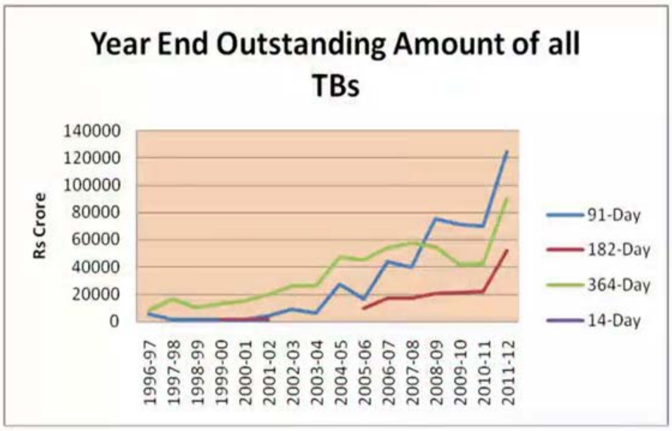

Figure III.10

The second preference is 364, and the third preference is 182 day the red line, but the implicit yield is the same. So, here I guess this is the reason if the implicit yield is same why would I keep the money for one year I I keep the money the same return I get for three month and look for another revenue. If the return from the 364 day were higher I would have brought 364, but the three I mean this kind of situation is there probably. So, this make some sense to you all right. So, it is going up look at how it has gone up.

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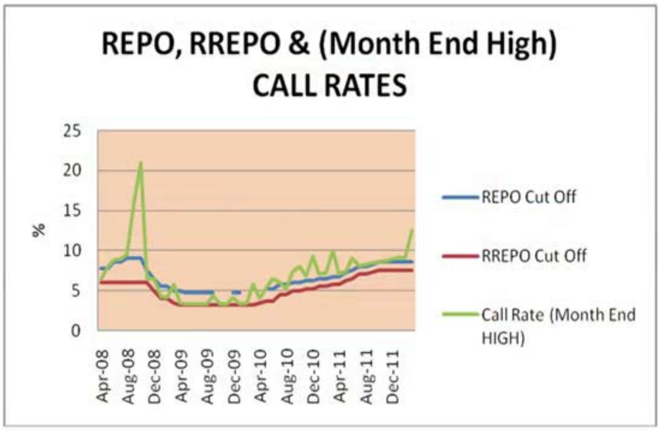

Figure III.12a

Now, I am running out of time again. Now, I am come to REPO so I will just show the REPO diagram this is the fascinating diagram I am going to come to the REPO market fantastic diagram this one. REPO market is fascinating, you can see the REPO cut off now this is the not the yield, this is the price the REPO rate all right. At government announce reverse REPO rate 4.5 percent, REPO rate 4 percent or reverse REPO rate 8.5 percent. This is RBI transaction in REPO under a scheme called liquidity adjustment facility LAF. This is not the market REPO, where banks are having a REPO transaction among themselves like the call market all right. It is the REPO market data on RBI's REPO transaction with the banks, which is announced on TV when RBI governor announces a new policy. Recently they lower the CRR just something few few weeks one week probably lower the CRR keep the REPO rates on change probably these are the things they did. I have that REPO and reverse REPO.

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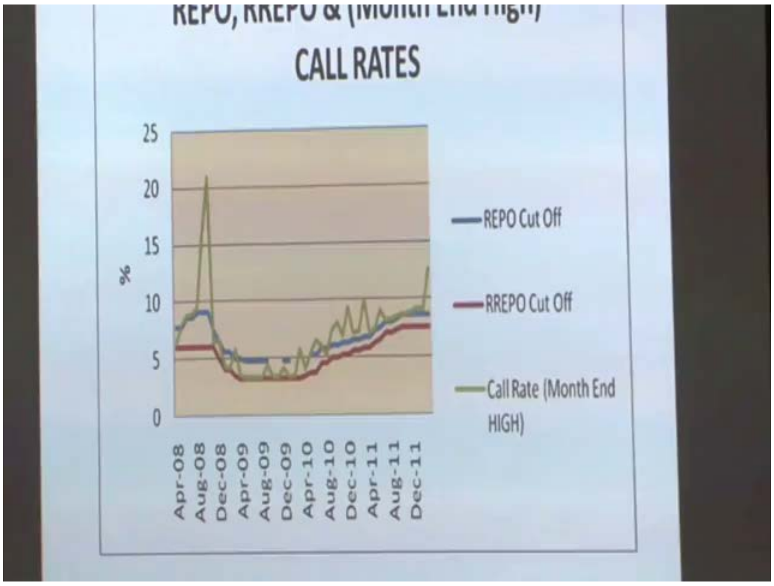

A couple of points, quick points, do you see that the there is a green interjection. So, if I remove the green interjection this diagram would be much more clean the blue line is the REPO and the red line is the reverse REPO. Do you notice that the REPO line and the reverse REPO line at distinctly different and what you see is that the rivers REPO is line bellow the REPO why is it so. Simply, because it is the RBI operated REPO market, where RBI looks at banks when they have surplus cash by doing them a favor by telling we will give you some interest give that cash to me we will hold it for a month, for a day, six months or whatever.

Banks cash the reverse REPO rate come where has the cash gone when they come to RBI for borrowing then they charge a higher interest rate favor all right it is clearly the REPO rate is above the reverse REPO rate. Look at it, REPO means injection of cash, banks wants money, they do not have, comes to RBI, REPO transaction reverse REPO bank RBI is billing them out all right.

So, there you have a different approach the interest rate is different. Now, the call market (( )) here, because often the call market is the place where the banks also go for cash, if they need cash or the lend whoever needs cash. So, people say the call market directly competes with the REPO market. So, what I done is the call market I plotted along with the two REPO rates by doing that we see a very interesting thing, there are minor (( )) more fluctuations since April 8, look at the data I have. April and this is a monthly data

April 8 to December 11 and then it has gone to march 12 which is not written there on the x axis. I have data up to March 12 financial year 11-12 from April 8.

So, I have started this data series plotted beginning of that famous financial year 08-09 month of April do you see after month of April, is there a major change right in the beginning a spike, what is the spike that you notice the green line, what is the month august, that is a famous call market rate gone up, august recession hit formally announced in the western world depression like recession. The REPO in the reverse REPO not much except the blue line has a little bit hump there, which means banks were requiring a little bit more cash. So, it did went up a few months, but then it came down and then they are two like brothers and sisters they move together.

But these are not a flat line it came down up to December 9, April 10 even after that after April 10, 10-11, 11-12 it has been steadily going up 10-11, 11-12 last two years is been going up, both are nice. So, the REPO has become more expensive reverse REPO has also become more expensive. These are month and high call rates which I have put, but one thing you see after the big bump, a spike the call market is saying well I am (( )) function nervous, I am more restless REPO guys are more steady, all right. I am more restless, but I lie very near to you, do you see that. I lie very close to you I am not very far away from you in the pre recession years data when I was using all right when I first plotted this course I used to plot the REPO reverse REPO underneath the call rate was between this gap fantastic it was.

Call rate between this gap, you can see up to some point it is between the gap and then it is having a spike up up a little bit the low may not low may still be between it the high is above it. If you do an average, if you do an average which I have for the month end no it is a month and high if I put on average it will come closer to the blue line.

This is the famous interest rate corridor government or RBI come message to RBI, RBI trying to make the short term money market competitive. So, the call market and the REPO market they all compete with each other, and they create a corridor like thing through which a short term interest rates various interest rates are here. REPO rates is an interest rate, reverse REPO rate is an interest rate, call rate is an interest rate, then the CP CDs are also interest rates. So, they wanted to create a short term corridor for short term interest rate they call it an REPO rate. This is called the corridor interest rate corridor famous.

But, one thing you see these difficulties years the corridor is wall is broken a little bit. The high is called rate have crossed or crossing going above the ceiling. But, earlier data when I used to plot they were all very close together the REPO reverse REPO call rate it was beautiful that beauty does not exist may be in the decision is difficult time when people are yield their concentration fluctuate they do not like they are not like normal person functioning so steadily etcetera. So, I guess RBI is marginally failing to keep that corridor intact, but still it is not a bad diagram.