Money and Banking
Prof. Dr. Surajit Sinha
Department of Humanities and Social Sciences
Indian Institute of Technology, Kanpur

Lecture - 5

We are coming to the end of topic 1 what is money? We started out with an definition of money, what money is, how it can be an effective medium of exchange, when talk about historical development of money, coins, paper currency then banking, checking accounts, etcetera. Then went to modern money which you use, you will have lots of them. Then I went into discussion of interest rate, interest rate is kind of considered to be the price of money, because what money has a price (( )).

So, usually we think about interest but the problem is, there are so many kinds of interest rates in the economy, so many kinds of interest rates. So, we need to discuss interest rates and I have been doing that then I came to present discounted value, which requires an interest rate as a discount factor. So, something will happen in future, I will get some income from a share in future, I will get some income from a bond in future, whether I should put money in the bond, how to decide.

So, I went into the secondary market also the price of a bond, in the primary market also there is a price and I told you, how a very special type of interest rate, that develops as a variable in an economy with respect to these dead instruments called yield to maturity, which is essentially a variable, as an unknown in an equation which is a polynomial. If you solve, you get the number which equates the price today of a death instrument which equates the price with to the present discounted value of the series of return, that I will get if I buy it.

So, if I buy a bond or invest money in a bond using your language, is it worth investing, what kind of a return do I get, there you get the concept of yield to maturity which I told you, which is also an interest rate. So, you get into the concept of yield to maturity and yield to maturity is a like solving an equation, that gives you yield to maturity. Now, let me ask you a simple question, now suppose, I give you a problem like a arithmetical problem say, I buy a discount bond which has zero coupon bonds, I buy a discount bond which is sold at a discount and it lasts only one period, it is a very short term bond.

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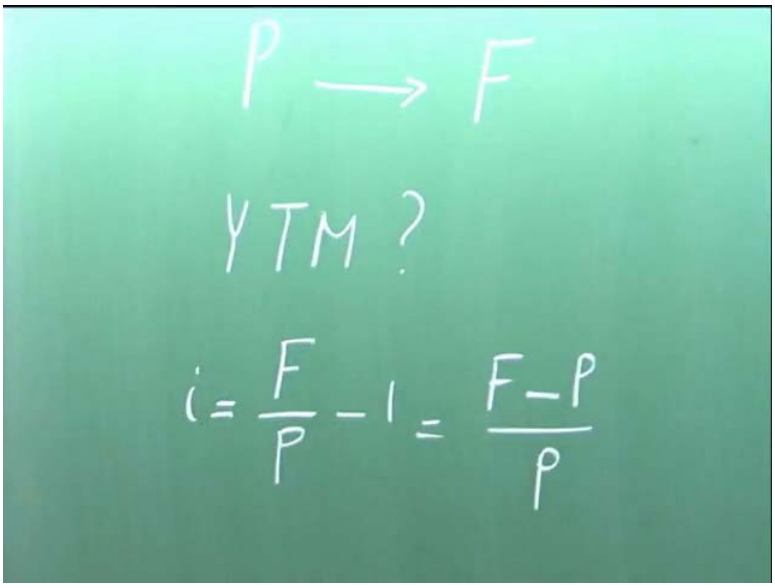

So, I buy the bond suppose, I buy the bond a discount bond at I buy a discount bond at price P right then after one period, I get the face value of the bond back say, 100 rupees after one period one period bond. What is the yield to maturity, somebody asks you what is YTM, how would you get the YTM, what I taught you so far, I am asking you to solve a simple problem, I buy a bond at P, F is the face value you get after one period…

Student: (( ))

F minus F by P minus 1 very good, that is the yield to maturity so it is F minus P over P it is very simple to calculate. Now, I get into something which is I am coming to the end of topic 1, I get into something I do not want to get angry but sometimes I feel angry. Now, I get into coming to the end, there is a concept of there is a concept of something called return on a death instrument like a bond a return on a death instrument there is a concept called return on a debt instrument.

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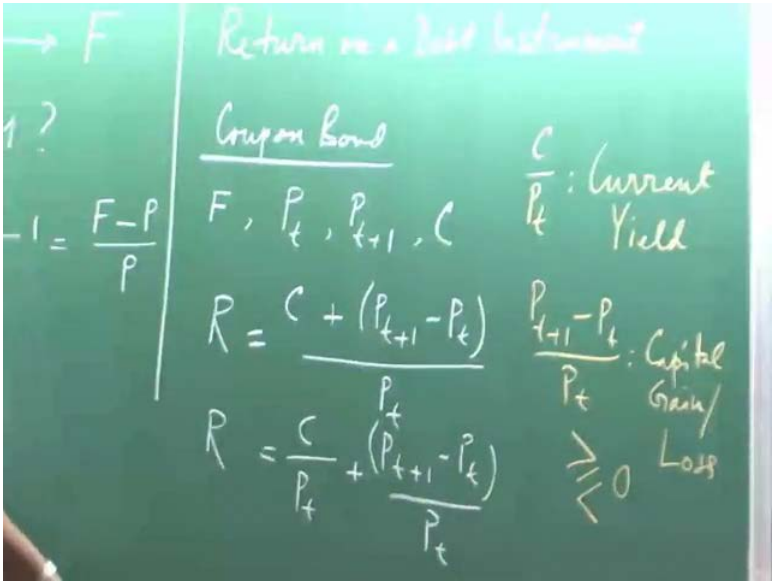

Now, how to calculate that, return on a debt instrument return on a death instrument, now this is looked at from the point of view of an investor. Tomorrow, you buy a certificate, a bond certificate it can also be true with respect to, you can calculate similar things with respect to a share. Tomorrow you invest a money some money bond certificate, which clearly says a coupon bond which says, how much it pays you every year, the coupon rate, what is the face value of it, it says all those things.

And it talks about the maturity say, 10 year bond or something or 5 year bond, 10 year bond but after 1 year, you hold it after 1 year suppose and you want to sell it off now, question may arise, after 1 year, he wants to sell it off ao, what kind of a return does he get. Of course, he will get the coupon payment suppose, 1000 rupee bond, 10 percent is the interest rate so he will get the coupon payment after 1 year say, for government bond so I get it from the government.

And then when he is selling it off, often the incentive is, the demand for this kind of an instrument has gone up so much in 1 year, that the market price at which it is being sold presently, the secondary market price is higher than the price at which he brought. So, this is the incentive for him to sell it off and not wait for 10 years to get all the return so the return on bond this I this I found in mishkin, the return on bond is as follows. The return on bond is as follows suppose, the consider a coupon bond now, there is a face value of the bond, there is a market price of the bond.

Now, consider to be two time periods, P t and P t plus 1 or I bought it at P t minus 1, I am selling it at P t whatever, two time periods, there is a coupon value of the bond depending upon the coupon rate, which is the interest rate, that it promises 10 percent or whatever. So, the return on bond is calculated as, let us see whether it makes sense to you, the coupon value plus the difference in the price, at which you bought the bond divided by P t with respect to the price, that you bought.

This is defined as the coupon, the rate of return on the bond which is essentially C over P t plus P t plus 1 minus P t divided by P t this is what, it works out to be R. Now, no big deal here but there are technical names as associated with it, which I am trying to tell you a few names which terminologies. The terminologies are, that this return on that bond after 1 year when I am selling it off, I got the coupon payment for 1 year C, 1 C, C over P t C over P t is called current yield and P t plus 1 minus P t over P t is called capital gain.

But, whenever we talk about capital gain, we also mention with a slash, they can also be capital loss, not necessarily it will be a gain. Suppose, the market is going down and you are trying to minimize the loss, market is going down, prices are falling, you want to sell it off as quickly as possible. Even if there is a loss, no capital gain or zero capital gain or loss, negative numbers there P t plus 1 minus P t over P t negative number. I am going to go for a minimization of loss, return may still be positive because the coupon payment is good.

But, the capital gain term has been replaced by a capital loss, P t plus 1 minus P t over P t is negative so this fellow here can be greater than equal to less than 0 remember that, there is always a possibility.

Student: (( ))

Does the rate of return is…

Student: (( ))

No, no no he cannot rebuy or purchase it, you have sold it for 10 years.

Student: (( ))

After maturity period (( )) after 1 year, he is selling it off, I do not want to hold it anymore, I am going to the secondary market that is why, the all he gets is one period return. Depending upon the coupon rate, the bond promises to pay an interest rate of 10 percent say, he gets the 10 percent income C, and which is time invariant because C is the constant and every period you will get C if he holds for 10 years, 10 years long you want, holds for 10 years every year, he gets C at the 10 th year, after a 10 th year he gets the face value back.

And now, if he sells it there is an additional return, the return is the capital gain this is what, he gambles essentially and he finds, if the capital gain is good, prices have gone up sufficiently. It can happen after 1 year, it can happen after 2 years, it can happen after 3 years who knows and he offloads that bond in the secondary market and not only earns a coupon payment from the issuer of the bond say the government but also, when he offloads he gets a capital gain.

But, it can so happen he offloads not to make a gain but to minimize loss remember because if the market is falling, he just wants to go into something else, he does not want to hold on to the bond anymore, he would minimize the loss. Although the return R can be positive, the capital gain the capital loss is small compare to C over current yields C over P t. You will find that in mishkin, there are many such relationships that can develop with respect to an instrument, I am just mentioning a few interest rate, yield to maturity, present discounted value, now I am talking about return on a bond.

Now finally, I have already spoke about it, I I have already spoken about it that is called the interest rate, the interest rates are of two types in a economics. The nominal interest rate is the one you see and the real interest rate is the one, which you can calculate. Nominal interest rate minus inflation rate is the real interest rate and I told you in one class one of these lectures, that it can so happen, that the real interest rate can be negative because nominal interest rate i is equal to real interest rate R plus pi.

If pi is too high say, pi is 10 percent and i is 7 percent so the real interest rate is minus 3 percent, real interest rate can be negative in an economy it is possible, which is in some sense also return on an investor. I put money in the bank fixed deposit, what do I get, I get the nominal interest payment but inflation rate is higher than the interest rate. My real

return that is also measure of return, the real return is which is more popular in macroeconomics than monetary economics or financial economics.

The real return is negative actually, I lost money by putting money in the bank so at times of high inflation, often if the interest rates are not high, people prefer to spend it because you give accumulate goods, it may not lose that amount of value. When the economy revise, I can sell of the goods say, people buy property, because know they know that there is a slum may be, prices are low.

So, buy them instead of putting money in the bank or a bond market or something put it in a property or jewelry or gold, whose price they expect to appreciate again when the economy is revive and that is how, they gamble that is why, what you have is a wealth, a basket of items. People have to decide, where to put the money, which you understand intuitively quite well I think, there is nothing. There is no knows, no extra message that an economist can you give you or an economics profession can give you, I am just giving you some technical things here.

Now, the problem as I told you, that the real it return or real interest rate can become negative creates a problem, these bonds have promised an interest rate. Now, if the inflation is going up and up, and I am going to hold the bond for 10 years because it has the maturity period of 10 years, length of the time of the bond to mature is 10 years, my return can become negative.

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So, many countries have now that developed something called indexed bonds, this is a language you have to learn indexed bonds, this is indexed to the inflation rate. That is, if the inflation goes up too much beyond a critical value then the issuer of the bond announces that the, that interest rate will become not 10 percent anymore but say, 11 percent or 10.5 percent or 12 percent. So that, the time you get the return, you do not lose value in real terms, you have a real income, real rate in some sense, does not become negative alright.

Even here, R has a possibility of becoming negative you can see that or 0 who has stopped you, if you allow even C over P, even if you say C over P can never be negative, even if you say C over P that is always positive, even if you say C over P is always positive but this fellow here can create help for you, when the stock market is crashing for instance, can create help for you. So, that R is not a nice thing that you come home with, you lose money from the stock market or the bond market or whatever alright clear.

Student: (( ))

Please read mishkin, he use an intuitive expression, they use that to calculate return, how do you come up with nominal interest rate is equal to real interest rate plus pi, it says some logic that you use to develop that relationship. It is not algebraically obtained from something, economics is largely based on intuition, it is a very intuitive subject (( )) now is that alright.

So, there I have given you an introduction to money and price of money and very important things I have touched upon, yield to maturity, interest rates, return on papers, bonds, etcetera various kinds of bonds, consol, discount bond, zero coupon bond, coupon bond. Coupon bonds are you know, they are very common treasury bills, etcetera I have told that (( )) treasury bills are also zero coupon bond, consol. Then you have this various kinds of loans, that you can fixed payment loan, which is very common you pay EMI.

You talk to anybody taken a loan from a bank to buy a car or purchase a house, they will tell you about the EMI thing, EMI is a fixed payment loan, it is very simple it is not you pay the interest every month and only the principle at the end. The entire amount for the entire span of the loan, 10 year loan is divided into 12 equal parts by the bank, they calculate it and you say, 10 equal parts and every part they subdivide into monthly basis by dividing it by 12 and then they ask you to give an EMI.

The problem is, banks are very smart, they may that make that EMI of an indexed to inflation but when you buy a fixed deposit certificate from a bank, interest rate is not indexed to inflation, I have not seen that at least with Indian banks. But, the EMI is an indexed to inflation, suddenly a paper comes to your home, you come home from office, you know this is the EMI you pay, you budget your family expenses this creates a scare among borrowers, middle income group borrowers, they have been many interesting cases, criminal cases and all sorts of things.

Then, he fails to pay the EMI on a simple scooter or a motor cycle, a person took loan in Delhi a few years back, he failed to pay the EMI and ICICI bank send their muscle man to recover the money. And then they drive him up the wall and then he commits suicide on a simple motor cycle loan, how do bank recover, they can go to court and they are finding court proceedings very lengthy so they send muscle men, they hire these muscle people may be, wrestlers from or something (( )). I am not joking at all, this is true with Indian banks, the famous ones also ICICI, I read on the or in the newspaper, on the TV my source of knowledge unless they are lying, I do not know, I never met these families (( )) so now, I go to topic 2.

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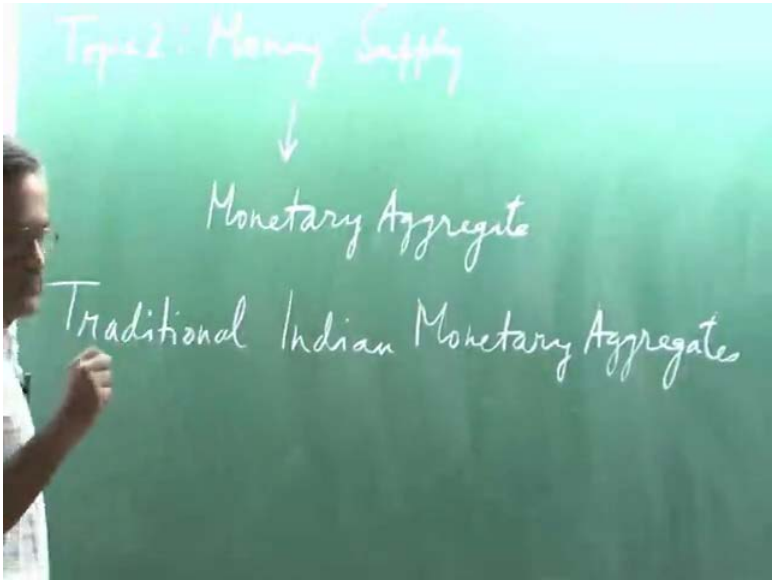

Topic 2 now, I am getting into core of money and banking, this was an introductory part initially, I call that the money supply process because money supply is a process. But, I drop the word process because it bothers people probably, you can call that money

supply. Now, I am going to define money supply, which you have seen in ISLA model some M now, what that M is, I am going to talk about that M.

So, this is topic 2 now, money supply which we call in macroeconomics the money supply, in monetary economics, this is often referred to as, there are various kinds of definition of money supply. So, they refer to that as a monetary aggregate, they call that a monetary aggregate, aggregate is what, when you sum up add things. So, when you when you when I will now give you the definitions of money supply you will see, there is is an arithmetical sum going on and you change items, you get another monetary aggregate, another definition of money supply.

You drop something, add something else you get another one or you drop add a few more items, arithmetical sum you get another monetary aggregate, which is another definition of money supply. Now, traditionally, Indian monetary aggregates that is what I need to talk about first, traditional Indian monetary aggregates. Traditional Indian monetary aggregates, before I talk about the traditional Indian monetary aggregates, I need to talk about one very important which is also monetary aggregate but it is not considered to be money supply.

It is also an aggregate, it adds up a few things item a, item b, item c, item d are added and you get that, this is not what is part of a traditional money supply in any country. But, it exists in every country this is like, you look at this building, it has a foundation, you dig into the earth and you have this concrete platforms created, on which this building is erected. So, every structure that you see like a building has a base, not the floor I am talking about, floor which you can see but the base you do not see, base is underneath that floor, on which the superstructure is built. So, every monetary aggregate or money supply, which we know as money supply is actually built on this one base and this is called…

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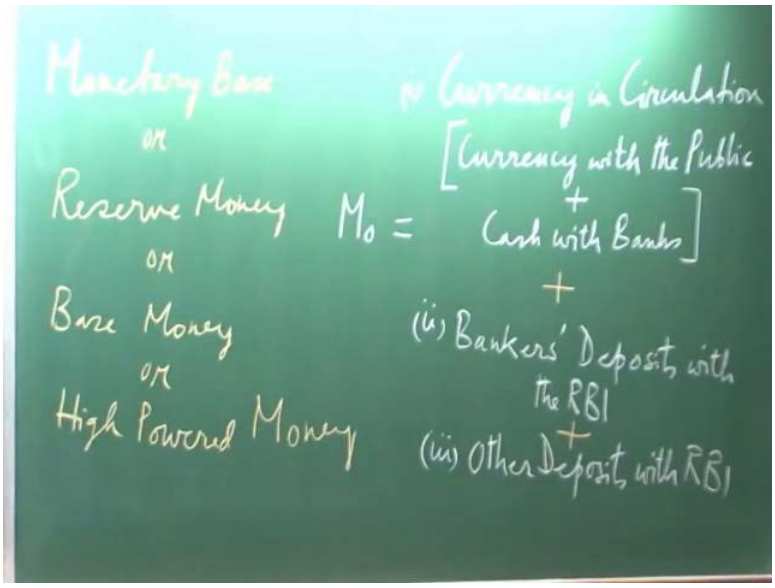

So, I need to talk about that first, this is called monetary monetary base, it is called monetary base, the base I use the word it is also called monetary base. So, I need to define the base first and it has other names also or reserved money, some books use the word reserve money or base money or high powered money, high powered money. So many names are there, I define this money or indicate this money, wherever you will see me and I have seen that in books also.

Either they use the term, sometimes the notation they use, either R or since monetary argregate, it is kind of a monetary aggregate, though not called money supply because it adds up things which is the base, they use the notation M naught. So, in this most in most places it is M naught, I am going to use M naught, some places they use the initial it is very acceptable like R. You know Y stands for output or income, M stands for money supply, i or R stands for interest rate, capital I is investment, G is government expenses, these are known things notations in macro economics or economics, pi for profit, C for cost, W for wage, this is very standard.

So, I am giving you a notation, which I would use is M naught and the money supply I would use M definition M 1, M 2, M 3, M 4, etcetera. The word is reserved or base money, consists of three items M naught, M naught is equal to number 1 called currency in circulation so currency that is circulating, money in your pocket, at in your hostel room, in you in your parents (( )) cash but it has two parts currency in circulation, one is

called it has two parts one is called currency with the public plus cash with banks, two parts are there.

So, this is number 1 first item then you have I would explain what are they, plus you have bankers deposits with the RBI. Item number 2, bankers deposits with the RBI Reserve Bank of India then it has the 3rd item, which is not very clear to me are other deposits with the RBI other deposits with RBI, so this is the 3rd item. So, essentially, you add them up, 3 items so it is a monetary aggregate but it is not called money supply, money supply is very different, money supply is something related to this.

Now, I would explain these items, this reserved money items, a monetary base items, currency in circulation usually central bank in India and in other countries, may they may also do the same thing. They consider currency that is there with the people, the public and what is public I need to explain, what is currency first of all, you know notes and coins.

Currency is notes and coins very simple, public is much more complex the definition, public in includes the entire economy except government, except government the central bank. And the entire banking system, which consist of commercial banks in India, cooperative banks and at the head is the central bank, which I have already mentioned. Public does not include government treasuries where, they keep cash for government use, whatever use paying the salary may be, paying whatever or other kind of expenses, whatever. Public does not include the entire banking system including the commercial banks like the State Bank of India and the Canara Bank and the Punjab National Bank and the Sindh bank then the Bank of Maharashtra.

And then you know you go on Bank of Baroda, United Bank of India, United Commercial Bank, whatever it used to be about 28, the number has come down 28 public sector banks in India, which are nationalized by the government. But, in addition to the public sector banks including 7 subsidiaries of SBI, SBI has subsidiaries also, add also private banks and it can all private banks either Indian private banks or foreign private banks.

So, City Bank, HongKong Bank, Deutsche Bank, (( )) all that the entire banking system but we also have cooperative banks, which does not exists in other countries. I would need to talk about that at the end of the course, cooperative banks the age old, early 20 th

century they were founded cooperative banks in India, very interesting. So, I would exclude that so the I talk about that later so the entire banking system, commercial banks like SBI, etcetera the cooperative banks and the boss, central bank RBI, excluded.

Interestingly enough, there are some non govern government departments, which deal with cash on a day to day basis, which are not really part of the government ministry like government companies are there. You have seen many government companies Indian Airlines, Air India (( )) the currency lying with them is part of public but not the traditional government treasuries, which ministry of finance has for instance, that is the headquarter of money in government.

Government treasuries are not part of public like the banking system is not a part of public, remember. So, you would ask me, sir non banks, there are lots of non banks you just mentioned ICICI, it has also commercial bank, ICICI bank it is called but I am talking about the mother organization ICICI, it is a non bank IDBI, SIDBI you name it. There are so many NABAD, non banks so many non banks are there in India, state financial corporations, infrastructure development bank.

What will happen to the non banks, they are all part of public, public includes them only basically two things are excluded, government treasuries and the banking system are excluded, remember public that is the definition. Since banking system is excluded, currency in circulation has just not currency with the public, plus cash with banks. Banks keep cash for your and my withdrawal, for their expenses, they keep cash for instant teller machines, they have now automatic teller machines, they also have to give cash there. At the end of the day, they do that probably or may be twice a day they do that, they have a routine to do that, put cash there, so banks carry cash.

Student: (( ))

Beg your pardon beg your pardon.

This is I am talking about currency, this is I am talking about currency only, this is nothing else, no goods there, no gold no ornament, nothing. Currency means, in some sense, cash what we call, we have two types of currency in India, notes and coins that is all. There should not be any confusion about it, yes.

Student: (( ))

Indian Railways will be part of the public, the cash they handle, it is like a government department, it has a Ministry of Railway of course but the cash it handles is not part of the government of India exchequer. Government of India exchequer would be lying with the finance ministry, both at the state level it is their department. So, Indian railway after it earns can contribute to the exchequer, when it goes to the exchequer, it is not part of , so long cash is lying with Indian Airlines or Air India or Railways, they are like government companies in some sense, that is part of public.

When I was young just now, the Railways, the Airlines was also monopolized in India, India never had a private airlines, foreign if private airlines or national airlines, flights use to come. I remember, my friends used to go abroad for studies would travel by foreign airlines because often they would offer cheap rates to the students. So, they were pickup a bundle of students from South East Asia somewhere, they stop in India somewhere Delhi, Calcutta, Bombay anywhere, they pick up again another bundle of students, they are going to US may be.

Then, they give them a halt may be, European airlines some give them a halt 3, 4 hours in Europe somewhere and then put them or again on another flight across Atlantic to US. It used to be a regular affair, not everybody Air India used to be very expensive and they are so competitive, their prices when also the student would go, take those flights Thai Airlines, they had a tie up with SAS candy winner service I remember so they used to start in Bangkok somewhere, first stop original then they would stop in Calcutta or Mumbai or Delhi go to may be Pakistan in Karachi and straight to Europe then cross the Atlantic.

But, no private Indian Airlines (( )) in fact, those days, the service used to be better, I do not know what has happened with it, service used to be quiet good but it used to be expensive a little bit compare to these foreign airlines, anyway that is a different thing. Now, bankers deposits with the RBI, this is a very important item number 2, let me conclude this three monetary base and then I will come back day after tomorrow and talk about proper money supply definitions in India, four are very popular.

So, I will talk about the four and you can access data in fact, I will show you some data, you can access data also to the with respect to these four variables. Now, bankers

deposits are very compulsory in India, there are one very compulsory aspect of banking deposit is, after the great depression in the western world 1929 to 1933, when banks failed lots of banks failed, they decided to put a regulation, a regulatory measure from the central bank on all commercial banks, that you have to deposit a percentage of the deposits, that you mobilize with us this is known as Cash Reserve Ratio, CRR.

Now, large large chunk of bankers deposit with the RBI is the CRR money of commercial banks that lie with the RBI. So, a large chunk of that bankers deposits with the RBI there can be more cash, there can be more cash too, it is called CRR Cash Reserve Ratio.

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This developed after the great depression of the 1930's, it was not there before, funny thing is you know, this time when the financial crisis came in the western world, I was teaching money and banking course on the 6 th floor. I said you would not believe me, this financial crisis would not have happened and banks would not have been in trouble if they had listened to their own rules, which they set 40, 60 years back. They have now made in those countries CRR values 0 but India is a very traditional conservative country, it is following CRR.

And Indian banks never got into any trouble, lots of cash always lies with the RBI, those guys, those countries who invented CRR do not follow CRR. When I open my some books, when I first found in one book, that the CRR value in Bank of Canada is nearly 0,

I could not believe this, I said what it this is nonsense. Then I found yes, it is true, they do not have CRR Cash Reserve Ratio, which is called CRR is a very important thing, that deposits they mobilize to the savings account and the fixed deposits, etcetera.

The money that goes from the public to the banks, a percentage on a weekly basis have to be kept, cash not shown kept with RBI, it will lie with RBI and they give the banks these days for CRR are fortnight. So, within a fortnight, 2 weeks back, the weekend the cash you had deposits to give us the number and then deposit that amount. The depositing of that actual cash they give banks a fortnight time, 15 days this is how, it is working now CRR.

I will talk about in topic 4 all these things so CRR Cash Reserve Ratio is the main contributor to that bankers deposit with RBI but banks also keep their own money there. Banks also keep money, you know why because they have a centralized checking facilities now, clearing facilities, cheque clearing facilities. (( )) alright it is done through RBI very easily because RBI has accounts of all banks (( )) centralized clearing facility.

am like the main central room sitting with a person like an account, a person representing an account of one particular bank, not particular branch a bank. So, what the good thing is that, the cheque did not have to go through postal service or manually from his to him and the cash to be carried, it is simply centralized it is done here, I just debit this account, I credit this account.

So, what the centralized clearing facility, banks are required to keep accounts and cash also with RBI. What I have understood, I have never worked for RBI, if you work for RBI, you would know more what I have understood by looking at the very minimal literature that is available this is what, they are doing. The references I have given you are also my references, I have no extra new reference to give to you in the course outline, that I have given you.

I have not read anything extra and found anything extra relevant significant yet so all my knowledge is based on, without working in a bank, without working in RBI, looking up the material, opening the RBI site which is available online and whatever, I could understand clear, so that is the bankers deposit. Now, the other deposits, this is a very little amount less than 1 percent even of monetary base, other deposits. I have looked at

the numbers, I think other deposits are consists of mainly foreign central banks, foreign banks deposits with RBI, they are allowed to open accounts.

RBI is a central bank, I and you as public cannot open account there but they give respect and give the freedom to a government, to a foreign government, to a international organization may be IMF, World Bank, Asian development bank, whatever or a foreign central bank to open an account. But, this money is very little compare to the total money because the value I have seen is less than 1 percent.

So, in my diagram, the slides I will show you on the on the variables, you will see other deposits are line is coincide with the x axis, it does not come above the x axis, is always sleeping there, it loves the bed, the x axis bed. It never came up because it is insignificant, over time over year it does not go up at all as a percentage, even the absolute value is little, so little. Even the absolute value compared to the magnitude of bankers deposits with RBI and currency in circulation alright so little, it does not show but I need to tell you about it, the importance. So, I will come up with slides at the end of the topic, many important slides and data unfortunately, in my course, like this applied course, I have to show you slides. Theory course I do not show slides but in a applied course, I do, so that is it for today.