

Banking 101

https://www.youtube.com/watch?v=bE8i-4HpKIM&ab_channel=PositiveMoney

Part 1: Misconceptions around Banking

There's a lot of confusion about how banks work and where money comes from. Very few members of the public really understand it. Economics graduates have a slightly better idea, but many university economics courses still teach a model of banking that hasn't applied to the real world for decades. The worrying thing is that many policy makers and economist still work on this outdated model.

Over the next hour we'll discover how banks really work, and how money is created. But first, to clear up any confusion, we need to see what's wrong about the way that most people think banks work.

Public Perception of Banking Number 1: The 'Safe Deposit Box'

Most of us had a piggy bank when we were kids. The idea is really simple: keep putting small amounts of money into your piggy bank, and when a rainy day comes along, the money will still be sat there waiting for you.

For a lot of people, this idea of keeping your money safe sticks with them into adult life. A poll done by ICM on behalf of the Cobden Centre found that a third of the UK public still believes that this is how banks work. When they were told that actually the bank doesn't just keep your money safe waiting for you to return and collect it, they answered "This is wrong – I haven't given them my permission to do so."

So, this idea that the banks keep our money safe is a bit of an illusion. Your bank account isn't a safe deposit box. The bank doesn't take your money, carry it down to the vault and put it in a box with your name written on the front. And it doesn't store it in any digital equivalent of a safe deposit box either.

What actually happens is that, when you put money into a bank, that money becomes the property of the bank. That's right. The money that you put into the bank isn't even your money.

When your salary gets paid into your account, that money actually becomes the legal property of the bank. Because it becomes their property, the bank can use it for effectively anything it likes. But what are those numbers that appear in your account? Is that not money?

In a legal sense, no. Those numbers in your account are just a record that the bank needs to repay you some money at some point in the future.

In the accounting of the bank, this is recorded as a liability of the bank to the customer. It's a liability because the money has to be repaid at some point in the future.

This concept of a liability is actually very simple and very important if you want to understand banking. Just think of it like this: if you borrowed £50 from a friend, you might make a note in your diary to remind you to repay the £50 in the near future. In the language of accounting, this is a liability from you, to your friend. So, the balance of your bank account doesn't actually represent the money that the bank is holding on your behalf. It just shows that they have a legal obligation, or liability to repay you the money at some point in the future. Whether they will actually have that money when you ask for it is a different issue but we'll talk about that later.

Public Perception of Banking Number 2: The Middle-Man

Now the other two thirds of the UK public have a slightly better understanding of how banks really work. These people think that banks take money from savers and lend it to borrowers. The Cobden Centre poll that we mentioned earlier asked people if they were worried about this process. Around 61% of people said they didn't mind so long as they get some interest and the bank isn't too reckless.

This idea of banks as middle-men between people with spare money and people who need to borrow money is very common. In this idea, banks borrow money from people who want to save it, such as pensioners and wealthy individuals, and they then use that money to lend it to people who need to borrow, such as young families that want to buy houses or small businesses that want to invest and grow.

The banks in this model make their money by charging the borrowers slightly more than they pay to the savers. The difference between the interest rates make up their profit.

In this model, banks just provide a service by getting money from people who don't need it at the time, to people who do. This implies that if there's no-one who wants to save, then no-one will be able to borrow. After all, if nobody came to the bank with savings then the bank wouldn't be able to make any loans. It also implies that if the banks lend far too much far too quickly, then they'll eventually run out of money to lend. If that was the case, then reckless lending would only last for a short time, and then the banks would have to stop once they ran out of people's savings to invest. That means it's good for the country if we save, because it will provide more money for businesses to grow, which will lead to more jobs and a healthier economy.

This is the way that a lot of economists think as well. In fact, a lot of economics courses at university still teach that the amount of investment in the economy depends on how much we have in savings. But this is completely wrong, as we'll see shortly.

Let me point out that, so far, we haven't talked at all about where the money really comes from. Most people just assume that money comes from the government or the Bank of England, after all, that's what's written on every £5, £10 or £20 note.

Part 2: What's wrong with the textbook 'Multiplier Model'?

We've seen the two main ideas that the general public have about the way banks work. Both of them are wrong. That's not too surprising, after all, unlike the Positive Money team, most people don't spend their time obsessing about how banks work. And banking is complex, which means that most people give up trying to understand it. But what about economics or finance students? Most of these students and graduates have a slightly better understanding of banking. They get taught about something called the 'Money Multiplier'.

The money multiplier story says that banks actually create much of the money in the economy. Here's how the story goes:

A man walks into a bank and deposits his salary of £1000 in cash.

Now the bank knows that, on average, the customer won't need the whole of his £1,000 returned all at once. He's probably going to spend a little bit of his salary each day over the course of the month.

So the bank assumes that much of the money deposited is 'idle' or spare and won't be needed on any particular day.

It keeps back a small 'reserve' of say 10% of the money deposited with it (in this case £100), and lends out the other £900 to somebody who needs a loan.

So the borrower takes this £900 and spends it at a local car dealer.

The local car dealer doesn't want to keep that much cash in its office, so it takes the money back to another bank.

Now the bank again realises that it can use the bulk of the money to make another loan.

It keeps back 10% (£90) and lends out the other £810 to make another loan.

Whoever borrows the £810 spends it, and it comes back to one of the banks again.

Whichever bank receives it then keeps back 10% ie, £81 and makes a new loan of £729.

This process of relending continues, with the same money being lent over and over again but with 10% of the money being put in the reserve every time.

Note that every one of the customers who paid money into the bank still thinks that their money is there, in the bank. The numbers on their bank statement confirm that the money is still there. Even though there is still only £1000 in cash flowing around, the sum

total of everyone's bank account balances has been increasing and so has the total amount of debt.

Supposedly this process continues, until after around 200 cycles, almost all of the original money is now in reserves, and only a fraction of a penny is being lent. By now, the sum total of all bank accounts adds up to about £10,000.

So the multiplier model that is still taught in many universities implies that this repeated process of a bank taking money from a customer, putting a little bit into a reserve, and then lending out the rest can create money out of nothing, because the same money is double-counted every time it is lent.

The model says that if the reserve ratio, that's the percentage of customers' money that the banks have to keep in a reserve is 10%, then the total amount of money will grow to roughly 10 times the amount of cash in the economy.

You can imagine this model as a pyramid. The cash is the base of the pyramid, and then depending on the reserve ratio, the banks multiply up the total amount of money by relending it over and over again. The fact is that what we've just shown you is completely wrong. It's an inaccurate and outdated way of describing how the banking system works. In fact, banks in the UK haven't worked like this for years. But despite that, this model is still used most of the time whenever people talk about how money is created, whether in universities or on videos on the internet. Before we spent 5 months researching exactly how the system worked, we used to think it worked like this too. The fact that this pyramid model is still used is a problem for three reasons:

Firstly, this model implies that banks have to wait until someone puts money into a bank before they can start making loans. This implies that banks just react passively to what customers do, and that they wait for people with savings to come along before they start lending. This is not how it really works, as we'll see later.

Secondly, it implies that the central bank has ultimate control over the total amount of money in the economy. They can control the amount of money by changing either the reserve ratio, that's the percentage of customers' money that banks have to keep in reserve, or the amount of 'base money' (cash) at the bottom of the pyramid. For example, if the Bank of England sets a legal reserve ratio and this reserve ratio is 10%, then the total money supply can grow to 10 times the amount of cash in the economy. If the Bank of England then increases the reserve ratio to 20%, then the money supply can only grow to 5 times the amount of cash in the economy. If the reserve ratio was dropped to 5%, then the money supply would grow 20 times the amount of cash in the economy. Alternatively, the Bank of England could change how much cash there was in the economy in the first place. If it printed another £1,000 and put that into the economy, and the reserve ratio is still 10%, then the theory says that the money supply will increase by a total of £10,000, after the banks have gone through the process of repeatedly re-

lending that money. This process is described as altering the amount of 'base money' in the economy. But the most significant implication of this model is that the Bank of England, or the Federal Reserve or European Central Bank, has complete control over how much money there really is in the economy. If they change the size of the base by pumping more 'base money' into the system, then the total amount of money should increase. If they change the reserve ratio, then the steepness of the sides of the pyramid will change. But eventually, the reserve ratio stops the money supply growing any further. At some point we reach the top of the pyramid and the money supply stops growing. So there's absolutely no possibility that the money supply can get out of control.

There's just one small problem. Almost everything about this description of banking is wrong. In fact, Professor Charles Goodhart, of the London School of Economics and an advisor to the Bank of England for over 30 years, described this model as "such an incomplete way of describing the process of the determination of the stock of money that it amounts to mis-instruction." It might be forgivable for textbooks to be out of date if the rules had changed in the last couple of years, after all, a lot of rules and regulations changed during the financial crisis. But, Professor Goodhart actually said this in 1984, 27 years later university students are still learning a description of banking that is completely inaccurate.

This is a big problem. If these students then go on to become economists and advisors to the government, and they don't even really understand how money works, then our economy could end up in a real mess. Oh wait.... It already is!

Now, I have to point out that these videos do apply to the UK, and we haven't had time to confirm exactly how things work in the USA and Europe. But for those of you in the US, a paper published in 1992 refers to a textbook still used in universities today and states that the "multiplier model... is at best a misleading and incomplete model, and at worst a completely mis-specified model."

Here's the bottom line when it comes to the 'money multiplier':

1. There's no reserve ratio in the UK anymore, and there hasn't been for a long time.
2. The Bank of England doesn't have any real control over the amount of cash, or even electronic 'base money' (which we'll talk about later).
3. The Bank of England certainly doesn't have control over how much money there is in the economy in total.

It's not just economics graduates who have the wrong information. Even people working in the Treasury still believe it works according to the textbook. We've had letters from the Treasury saying things like this:

"In relation to the point about the control of money, it is the Bank of England alone which has control over the monetary base. This consists of currency (bank notes and

coins) and reserves held by commercial banks at the Bank of England. Commercial banks are responsible for extending credit to individuals and businesses and have no authority to create or print money, digital or otherwise.”

Allowing people with an incomplete understanding of how money works to manage our economy is very dangerous. It’s like allowing engineering students who don’t understand gravity to build skyscrapers.

Part 3: How is money really created by banks?

Before we start looking at how money is really created, we need to have a quick look at what types of money we actually use in the economy. There’s actually three types of money that we use in the economy. As a member of the public, you will only have ever used two of them. The simplest form is cash, the £5, £10, £20 and £50 bank notes and the metal coins that most of us will have in our wallets at any point in time. As you probably know, only the government via the Royal Mint and the Bank of England, is allowed to create these. If you try to make your own at home, pretty soon you’ll get the police kicking down your door at 2 in the morning.

Now imagine that you need to pay your rent, and your landlord has an account with a different bank to you. When you log into your internet banking and make the payment to your landlord, your bank has to send some money to your landlord’s bank to settle and complete the transaction. Of course, the banks don’t want to make these payments to each other in physical cash because carrying all this money around is dangerous, even if they use protected security vans and guards with bullet proof vests and helmets. So, instead they use a type of electronic money, which is called ‘central bank reserves.’ Remember that name because we’ll be using it a lot in this video.

Central bank reserves are effectively an electronic version of cash, and banks use these electronic central bank reserves to make payments to each other. The central bank reserves are created by the Bank of England, we’ll cover how later on, and they can only be ‘stored’ in accounts that the big banks have with the Bank of England. To get one of these accounts at the Bank of England, you have to be a bank. So, as members of the public, we can’t get our hands on any central bank reserve. We just have to use the physical cash.

So the first two types of money are:

1. Cash
2. Central Bank Reserves

Remember that central bank reserves are like an electronic version of cash that only the banks can use to make payments between themselves.

The third type of money is a type of money that isn't created by the Bank of England, the Royal Mint or any other part of government. This third type of money is the type of money that's in your bank account right now. This money is just numbers in a computer system. Bankers and economists refer to this type of money with jargon such as 'bank deposits', 'demand deposits', 'sight deposits' or 'bank credit'. These terms all pretty much mean the same thing and are used interchangeably. They might also be referred to as bank liabilities. This is the accountant term because this money is a liability of the bank to you ie. it's what the bank needs to repay you at some point in the future.

Now in a legal sense the numbers in your account aren't really money at all. But despite that they serve exactly the same purpose as the £10 and £20 notes that you might hold in your wallet. It's this type of electronic, bank-deposit money that now makes up over 97% of all the money used in the UK economy. Less than 3% of the money supply is cash created by the government. And all this electronic bank-money is created by the banks, as we'll explain now.

The Balloon Model

Let's revisit the multiplier model that we saw in the last video. Remember that it describes the money system as having a base of 'base money'. In the simplified version, the base is made up of cash. In reality, it's not just cash in this base, it's also the electronic central bank reserves that banks keep in their accounts at the Bank of England. But it's true that this base is made up of money, either cash or electronic, that was created by either the Bank of England or the Royal Mint.

Now let's look at the top of the pyramid. The rest of the pyramid is made up of the third type of money, the electronic bank-created money. So the pyramid is split up into a base of government created money and a tower of bank-created money at the top.

Remember that we said that this pyramid, in theory, is limited by the reserve ratio? Well, there is no reserve ration and there hasn't been for years. This means that the total amount of money in the economy isn't really limited. It can keep expanding without coming to a point at the top. So, the pyramid is actually the wrong shape to describe the money system. In reality its closer to a balloon of bank-created money, wrapped around a smaller balloon of base money. In this case, the base money is the electronic central bank reserves and cash. As we'll see in this video the Bank of England has relatively little control over the total size of the balloon of bank-created money. They can't really control how much money is in the economy, even if they claim to be able to.

The outer balloon of bank created money could expand out of control and the Bank of England wouldn't be able to stop it, at least not within the current monetary system. We

saw this happen before the crisis. In 2006, the outer balloon of bank-created money was 80 times bigger than the inner balloon of base money. The multiplier wasn't 10 times, like the textbook model suggest; it was actually 80 times. And then when banks panicked during the crisis and refused to lend, the Bank of England pumped a load of extra base money into the inner balloon, through the scheme known as Quantitative Easing. But this didn't lead to a massive increase in the size of the outer balloon. Right now the outer balloon, the amount of bank-created money, is only 14 times bigger than the inner balloon. This shows that there is no real connection between the amount of central bank reserves or base money and how much money that the banks are able to create.

So what actually effects the ratio between bank-created money in the outer balloon and government-created cash and central bank reserves in the inner balloon? What determines how much money is created for the economy?

The research that we have done suggests that the amount of money that banks can create is not determined by reserve ratios or by regulation, or by the control of the bank of England. The reality is that the total amount of money depends on the confidence of the banks. If they're feeling confident banks will create new money by lending more. And when they're scared, they limit their lending which limits the creation of money. So, the size of the outer balloon really depends on the confidence and incentives of the banks. Or to put it another way, the amount of money in the economy depends on the mood swings of bankers. Given that the amount of money in the economy can determine the health of the economy, does it sound like a good idea to have such an important thing decided by the mood swings of bankers? Probably not!

Exactly how banks create money out of nothing

Ok, back to the numbers in your bank account. These numbers are all created by the banks. The vast majority of these numbers were created when somebody took out a loan from a bank. Let's see how this happens:

A customer, who we'll call Robert walks into a Barclays Bank and asks to borrow £10,000 for home improvements. Barclays run a quick automated credit check and decides that the customer can be relied on to keep up repayments on the loan. The customer signs a loan contract promising to repay the £10,000 plus the interest over the next 4 years, according to an agreed monthly schedule. This loan contract is a legal contract that binds the customer to make repayments to the bank. This means that it is a legal contract that is considered to be worth £10,000 (plus the interest). Because it's an asset, Barclays can record the loan on its balance sheet. Now if you haven't come across a balance sheet before, don't worry, it's pretty simple. There's two parts to a balance sheet. One half records all the things that the bank owns, this could be money, other financial products like bonds and derivatives, bank buildings, computers and most importantly the loans that it has made.

How can you own a loan? Well, if someone signs a contract promising to pay you money, then that contract is worth something. It's considered an asset of the bank. In the case of Robert, the contract that he signs promising to pay the bank £10,000 plus interest over the next few years is worth at least £10,000 to the bank, and therefore it is an asset to the bank. So the bank puts an extra £10,000 on its balance sheet, like this:

Balance Sheet

ASSETS	LIABILITIES
The bank's money + what borrowers owe	The bank's net worth + what is owes to depositors
Loan to Robert £10,000	Robert's new account: £10,000

Now what about the other half of the balance sheet?

The other half of the balance sheet is what's called liabilities. This is a record of everything the bank owes to other people. On this side, you'll find a record of money that the bank has borrowed from other banks or large pension funds. You'll also find all the customers' accounts, because if you remember, the balance of your account is just a number showing what the bank promises to pay you when you ask for your money back.

When Robert signed the contract promising to pay the bank £10,000 plus interest over the next few years, he did it because he wanted some money from the bank. So the bank creates a new account for Robert, which is linked to his debit card, and types in £10,000 into their computer records. This £10,000 is a liability from the bank to Robert and it shows up on the other half of the balance sheet.

Now when Robert goes to the cash machine to check his balance, he'll see £10,000 which he didn't have before.

All the bank has done to create this new money is type some numbers into an account. It hasn't reduced the balance of anyone else's account and it hasn't taken any money from some pensioners and moved it into Robert's account.

So the process of creating commercial bank money, that's the money that the general public use, is as simple as:

1. A customer signing a loan contract
2. The bank typing numbers into a new account set up for that customer

This new bank-created money represents new spending power, or money, in the economy.

Robert can now go and spend his money anywhere in the economy, using his debit card, cheque book, internet banking transfers, or even by taking the cash out of the ATM.

Inter-Bank Settlement: One Payment

But there's a small complication. What happens if Robert goes and spends the new bank-created money with a shop that has a bank account with a different bank, say Lloyds?

If this happens, then Lloyds will want to see £10,000 of real money from Barclays. Barclays would then need to transfer £10,000 of central bank reserves to Lloyds to settle the transaction. Note that from the point of view of Lloyds, receiving a transfer £10,000 in central bank reserves into its account at the Bank of England is just as good as Barclays pulling up in a truck and dropping off £10,000 in cash, although it's much more convenient for the banks to have the electronic central bank reserves than to carry around all that cash.

This process of banks making payments between themselves is called inter-bank settlement and it's really important to understand it, because it's crucial to the way that banks have been able to gain control of the entire money supply.

First, let's look at the simplest example of inter-bank settlement, with just two banks and two customers.

Robert, when he receives his loan goes straight into a DIY store and spends £10,000 on everything he needs. He gets to the checkout and pays using his visa debit card. Here's a simplified version of what happens behind the scenes:

First, the DIY Store's debit card machine automatically contacts visa and says "Please charge £10,000 to this card number xxxxxxxx."

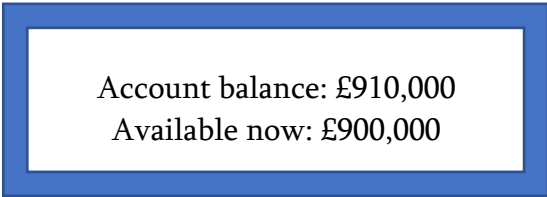
Visa's computer systems then dial up Barclay's computer systems and says "Robert's trying to spend £10,000 on his debit card. Is that ok?"

Barclays computer system check the balance of the account and says "Yes" Barclays computer system then reduces the balance of Robert's account by £10,000.

Now, visa's computer system contacts Lloyds and says "I'm sending you £10,000 for the DIY store's account" Lloyds then updates the balance of the DIY store by £10,000.

However, importantly, when the owners of the DIY store log into their internet banking they see two figures.

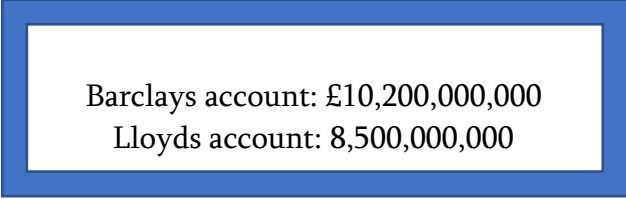
One says "Account balance and the other says Available now."



Account balance: £910,000
Available now: £900,000

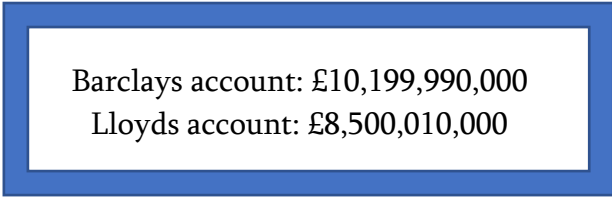
For the next couple of days after Robert has come into the shop, the account balance will be £10,000 higher than the available now balance. The £10,000 that Robert has spent isn't available to the DIY store for them to spend just yet. Why?

Well, behind the scenes, Barclays need to settle with Lloyds. When Lloyds get the message that someone has spent £10,000 in the DIY store, it updates their account balance and then calls Barclays to say "Send me the money..." Barclays could settle with Lloyds by delivering the £10,000 in cash, but in reality this is just a hassle for both banks. They'd have to find somewhere to store all the cash and a van with security to transport it. So instead, Barclays will settle by making a £10,000 transfer from its reserve account at the Bank of England, to Lloyds reserve account at the Bank of England.



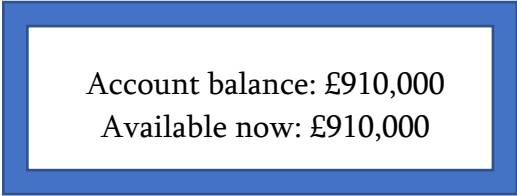
Barclays account: £10,200,000,000
Lloyds account: 8,500,000,000

Once Lloyds gets the £10,000 in its account at the Bank of England,



Barclays account: £10,199,990,000
Lloyds account: £8,500,010,000

then it will update the available balance in the DIY store's account.



Account balance: £910,000
Available now: £910,000

Inter-Bank Settlement: Multiple Payments

Now this was a simple example that involved just one payment between two bank customers (Robert and the DIY store) Only two banks are involved.

But in the UK right now there are around 50 million people with bank accounts. Some of these people make more than one electronic payment a day. And they bank with over 50 different banks. In fact, every day over 60 million transactions are made between bank accounts in the UK through a number of different payment systems including visa, Mastercard, direct debit and online bank transfers. If banks had to go through the whole hassle in the example with Robert every time someone bought a sandwich from a supermarket using their debit card, it would get very messy very quickly. But there's a

clever way of simplifying the whole thing massively. It's called multi-lateral net settlement.

When you have a lot of individuals and businesses making payments to each other, that's a lot of money flowing between the different banks. So, what the banks do, especially with systems like BACS (which manages direct debits and the type of bank transfers that you make via internet banking, is this. First, they put all the payments into a big computer database without actually moving any real money, cash or central bank reserve about. Then, at the end of the day or every few hours, they run a process to cancel out as many of the payment flows as possible. For example, imagine a customer at Lloyds sends his rent, £350, to his landlord's account at Barclays. But on the same day a customer at Barclays sends his own rent, £400, to his own landlord who happens to be a Lloyds. The two payments almost cancel each other out, so after cancelling out, or 'netting' in the official jargon, the only money that really needs to be moved is £50 from Barclays to Lloyds.

Because there are millions of payments being cancelled out by this system, the amounts that actually need to be transferred between the banks at the end of the day are usually just a tiny fraction of the total value of the payments made.

This is why, even though in 2007 RBS customers had nearly £700 billion in its customer accounts, RBS itself only had £17 billion that it could actually use to make payments on behalf of those customers. This £17 billion was more than enough for the total netted payments that it would need to make at the end of each day.

Fractional Reserve Banking

This netting out effect means that a bank only needs to have a very small amount of available money compared to the total amount that they owe to customers at any particular time. They know that any payments they make to other banks are likely to be cancelled out by payments coming back to it.

On some days the banks customers will spend more than they receive, and at the end of the day the bank must pay some of its money across to other banks to settle these payments. But on other days, customers will receive more, in salaries and other income, than they pay out, and the bank will end up receiving money from other banks at the end of the day.

Over time, the total amount of money needed by the bank doesn't change much. The only time that they would actually need all the money that they owe to their customers is if customers were to panic and ask for all their money back at the same time. This is what happened to Northern Rock in the UK and Wachovia in the US, and it can destroy a bank very quickly. This process is what gave rise to the term fractional reserve banking,

because banks only need to keep enough money to repay a fraction of their customers at any time.

Reserve Accounts & Real Time Gross Settlement

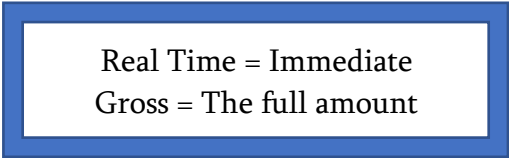
We've talked about the central bank reserves that banks keep in their accounts at the Bank of England. These 'reserve accounts' don't store cash, just electronic central bank reserves. It's important to appreciate that, although central bank reserves are created by the Bank of England, they're still just numbers in a computer system. These numbers are just stored on a file very similar to an Excel spreadsheet, and we could create a billion of them in the time it takes to type out £1,000,000,000.

The £150 billion of central bank reserves are no more tangible than the numbers on this screen, and in fact, the entire record of balances of the central bank reserves scheme will take up less space on the Bank of England's computer hard drive than the average song on an MP3 player.

Now the computer system that records all these central bank reserves is referred to by the Bank of England as the Real Time Gross Settlement Processor, or RTGS Processor. Now real-time gross settlement isn't as complicated as it sounds.

Settlement simply means that it's a system that banks can use to settle their payments to each other, in other words, it's a way for them to transfer money to each other.

'Real Time Gross Settlement' means that any payment instruction sent to the computer system is processed immediately. If a payment of £100,000 is sent to the system, £100,000 will be transferred automatically.



Real Time = Immediate
Gross = The full amount

This is in contrast to multi-lateral net settlement that we discussed just before, in which all the payments are queued up, cancelled out against each other, and only the final net difference is transferred.

When a payment is put through the RTGS processor it's considered to be final. It's also considered to be risk-free: If one bank owes money to another bank, there's always a small chance that it won't be able to pay the other bank. But once the money has arrived in the central bank reserve account, then the deal is finished, because holding central bank reserves is just like holding cash, it's the safest asset you can have.

So, at the end of the day, the multi-lateral net settlement payment systems will cancel out all the smaller payments between different banks, and then they'll tell the Real Time Gross Settlement Processor how much the net difference owed between the banks should be. The RTGS system will then transfer the central bank reserves from the banks that owe money to the banks that are owed money.

RECAP

So, let's recap everything we've covered so far, before we look into what actually determines how much money the banks can create.

We've seen that the textbook model of money creation suggests that there's a base of central-bank or government created money, on top of which the commercial banks can blow up the total money supply by re-lending the same money over and over again.

We saw that this model is actually completely inaccurate. There's no natural limit to how big the money supply can grow, so it's actually better to think about this as two balloons rather than a pyramid.

We saw that banks can create money by simply typing numbers into a customers' account when they make a loan. When you sign the contract, the bank gets an asset that balances out the new liability they create when they type numbers into your account.

When a customer spends the money the bank has just created, and those payments go to the customers of other banks, then the other banks will call the bank that created the money and ask for them to settle in central bank reserves. But before this happens, payment systems like BACS and visa debit will cancel out the payments against each other, so that the net difference at the end of the day has to be settled ie, transferred between the banks. This netting out significantly reduces how much money banks really need to keep at any particular time.

In a few minutes, we'll see what actually limits how much money the banks can create. But first, it's worth asking whether the numbers that banks create can really be considered money.

Part 4: What determines how much money the banks can create?

So, what actually limits how much money the banks can create?

You've probably seen the standard multiplier explanation of fractional reserve banking that we discussed in an earlier video. In this model, the banks have to keep a percentage of their customers' money in a 'reserve'. The reserve ratio given is usually 10%, which means that for every £100 paid into a bank by customers, the bank must keep £10 in a

reserve somewhere. This means that the banks can only expand the money supply up to 10 times the amount of real, government created money.

We said that this model of banking is completely inaccurate, at least in the UK. For a start, the required reserve ratio in the UK isn't 10%, it's zero. But more fundamentally, the reserve ratio would only actually limit the amount of money that banks can create if the 'reserve' money was actually taken out of circulation and put into a safe deposit box, or an electronic equivalent. If the Bank of England actually required banks to hold £10 of cash or central bank reserves for every £100 that they typed into their customers' bank accounts, then that would limit the money supply to around 10 times the amount of base money (the cash and central bank reserves). The pyramid model would then actually apply. But this is almost never what happens.

Liquidity Ratio

When there was a reserve ratio in the UK, it was what's called a liquidity ration. A liquidity ratio is deceptively similar to a reserve ratio, but fundamentally different. A liquidity ratio requires banks to hold liquid assets equal to a percentage of the deposits. So, if a liquidity ratio was set at 10%, then a bank with £100 in a customers' account would need to hold £10 of liquid assets. Now you're probably thinking, what's the difference between this and the normal reserve ratio?

Well the key point is the term 'liquid assets'. Liquid assets include cash and central bank reserves, but they also include other things, in particular government bonds. While the reserve ratio used in the textbook model of banking requires banks to hold cash and central bank reserves in proportion to the total balances of their customers' bank accounts, a liquidity ratio actually allows the banks to use that cash and central bank reserves to buy bonds. The bonds also count towards the liquidity ratio, meaning that the bank could not hold any cash or central bank reserves and still meet the ratio. But the key detail here is that when a bank uses central bank reserves to buy bonds, the central bank reserves then belong to another bank. In other words, they're not removed from circulation, they're still circulating through the system.

This means that a liquidity ratio, as opposed to a proper cash-and-central-bank-reserves ratio, has no limiting effect on the total amount of money that the banking sector as a whole can create.

So a liquidity reserve ratio will not limit the banking sector's total ability to create money.

We did used to have liquidity reserve ratios in the UK. In fact, from the mid 19th century banks tended to keep an average of 60% of liquid assets as a proportion of their total liabilities. This was actually a self-imposed reserve requirement, it's what the banks knew they needed to keep back in order to avoid the risk of a run on the bank.

In 1866 there was a banking crisis, and the Bank of England then took on the role of 'lender of last resort', committing to lend to banks if they ran out of money to make their payments.

Once this safety net was in place, banks reduced their liquid reserves to around 30%.

In 1947, when the Bank of England was nationalised, they imposed a formal liquidity reserve ratio of 32%. This reserve ratio required banks to hold £32 of cash, central bank reserves and government bonds for every £100 balance in customers' accounts. Of course, because government bonds would earn the bank some interest, unlike reserves and cash, the banks would try to hold as much of this 32% as possible in the form of bonds.

In 1963 this liquidity ratio was dropped to 28%, then, in the words of the Bank of England

"Before 1971, the clearing banks had been required to hold liquid assets equivalent to 28% of deposits. From 1971, this was relaxed and extended, requiring all banks to hold reserve assets equivalent to 12.5 % of eligible liabilities... This combination of regulatory and economic factors coincided with one of the most rapid periods of credit growth in the 20th century (Chart 10). It also contributed to an ongoing decline in banks' liquidity holdings, ultimately to below 5% of total assets by the end of 1970."

Credit Growth

In this phrase 'credit growth' really means a massive expansion in the amount of bank-created money and consequently a massive rise in debt.

Finally in 1981, the liquidity reserve ratios were abolished all together. So, if the Bank of England no longer sets a liquidity reserve ratio, is there a natural requirement for banks to keep liquid reserves in proportion to their total customer accounts?

In other words, is the system naturally limited?

Well let's look at the central bank clearing system again. Remember that there are 46 banks with reserve accounts at the Bank of England. At the end of the day when all payments are cancelled out against each other, these banks have to settle between themselves by transferring money between these reserve accounts.

Now, the important thing is that this system of central bank reserve accounts is a closed loop. It's technically impossible for any central bank reserves to leave the loop, because central bank reserves are by definition numbers in accounts at the central bank, and only the Bank of England is able to actually create or destroy central bank reserves. So, when all the payments are cleared at the end of the day and the banks find out how much they

actually need to transfer to settle up, some banks will end up having to pay money to other banks, and other banks will end up receiving money from other banks.

What happens if one bank doesn't have enough central bank reserves at the end of the day to make its payments to other banks? Well because it's a closed loop system it's mathematically certain that one of the other banks will have more money than it needs to make its payments. What happens then is that the bank that has more central bank reserves than it needs lends some of them to the bank that doesn't have enough.

This lending of central bank reserves between commercial banks is called the inter-bank lending market. And as long as the banks that end up with more reserves than they need are happy to lend it to banks that have less reserves than they need, then all banks will be able to make their payments and there's nothing to worry about.

So a bank can actually make a loan, creating new money in the hands of the public, even if it doesn't have the reserves because it knows that at the end of the day, when all payments are netted out against each other, another bank will be there willing to lend it some reserves to settle its own payments.

So as long as all banks are increasing their lending at roughly the same rate, the money supply can keep increasing without the need for additional reserves. So, banks don't really depend on having reserves before they can create money. They can make the loan first and find the reserves to settle the payment by borrowing them from another bank. And collectively banks can increase the money supply, almost indefinitely without being restrained by the amount of central bank reserves. In fact, before the financial crisis the ratio between the bank created money in the hands of the public, and the central bank reserves was 80:1. Of course, this only works if the banks are willing to lend to each other. If they think the other banks might not repay them then they'll refuse to lend. If some of the banks decide to sit on their reserves and refuse to engage in the inter-bank lending market, it becomes a mathematical certainty that one of the other banks will struggle to make its payments. If this happens then the entire payment system could very quickly fall apart. This is what happened during the financial crisis.

The only way to avoid this is for the central bank to pump in such a huge quantity of reserves that every single bank has more reserves than they need. This would mean that they no longer need to lend to each other. This is effectively what the Quantitative Easing scheme did, by pumping reserves into the banks and making it unnecessary for them to lend to each other.

So far we've seen that there is no liquidity reserve ratio, and that banks don't really need to have central bank reserves in order to lend. But what about the capital adequacy ratios or Basel accords that everyone is talking about?

Well the capital adequacy ratios relate to something quite different, but to understand why we need to look at the balance sheets again.

Remember that the assets side of the balance sheets shows everything that the banks owns, including all its loans and mortgages and the liabilities side shows everything that the bank owes to other people or companies. There's a third party of the balance sheet, which is something called shareholder equity. Shareholder equity is very simply what's left for the owners of the company when all the assets are sold and all the liabilities are paid off.

ASSETS	LIABILITIES	EQUITY
The bank's money + what borrowers owe	What it owes to depositors	What's left for the shareholders

To avoid going bankrupt, a bank needs to make sure that its assets are greater than its liabilities. When somebody defaults on a loan and stops making repayments, then the bank has to repossess the house and sell it off, usually at an auction.

The bank will usually get less at the auction than the original value of the loan. That means that it loses money by repossessing the house. The mortgages on the balance sheet that was originally quarter of a million has turned into a house that will be sold for less than a quarter of a million.

So, when loans and mortgages go bad, it reduces the assets of the bank. Now if only a small percentage of the loans go bad, there's no problem. The bank already expects at least one or two out of every 100 mortgages to go bad, that's just part of the risk, and besides the interest payments from the loans that don't go bad should cover these losses.

But, if everyone starts defaulting at the same time, then the bank's assets can start shrinking rapidly. If the assets shrink so much that the bank's assets are less than their liabilities, then the bank is insolvent and should be liquidated and shut down.

The problem is that while the bank is being liquidated, most customers will be unable to access their money. This can cause big problems in the economy, and could even trigger a panic that leads to people trying to get money out of their other accounts and causing those banks to have difficulties too.

So, to try and prevent this from happening there is something called the 'Basel accords' or capital adequacy ratios.

Capital adequacy ratios basically require the banks to keep a buffer that's big enough to absorb any losses by the banks. The bigger the buffer, the more of a bank's loans can go bad before it becomes insolvent.

BANK'S BALANCE SHEET

ASSETS	LIABILITIES
Loans	Deposits (customer accounts)
Own funds + other assets	Equity (buffer)

We won't go into too much details on how this scheme works here, but the key thing you need to know is this. When the bank makes a profit on its loans, then this profit increases the size of the capital buffer. If its capital buffer is bigger then it can afford to make more loans. So when the economy is improving, the ability of banks to lend will also increase. This leads to them lending more, making more profits, and further increasing their ability to lend.

In other words, capital adequacy requirements don't limit the ability of banks to create money when the economy is doing well. However, they do limit the ability of banks to create money when the economy is doing badly. And as we've seen, the money supply of the nation is dependent on the lending of banks which means that the capital buffers make the instability in the money supply even worse.

But the important thing is that the capital adequacy reserves are not, and never have been, intended to limit how much money the banks can create, or how much reckless lending they can do. It's simply about trying to ensure that when things do go wrong and loans start going bad, the banks have enough of a buffer to avoid going bankrupt.

So to sum up, what does actually limit the ability of banks to increase the money supply?

We've seen that the type of reserve ratio that's discussed in the textbooks has never even existed in the UK.

We've seen that the liquidity ratios that did exist have been reduced and eventually abolished, and that even when they did exist, they only limited the speed that the money supply could increase, but put no limit on the total size that it could grow to.

We've also seen that the Capital Adequacy Ratios and Basel accords are about preventing banks from going bust when loans go bad, rather than limiting their dangerous lending or limiting how much money they create through lending. And although the capital adequacy requirements can restrain lending after a banking crisis, it doesn't do anything to restrain lending in a boom.

We've also seen that there is no natural limit on how quickly the banks can create money. They know that even if they don't have the actual central bank reserves to make payments, they'll be able to borrow those reserves from other banks, or even the central banks.

All this comes together to imply that the only thing that truly limits the creation of money, is the willingness of banks to lend. And their willingness to lend depends on their confidence.

In other words, the money supply of the nation depends on the mood swings of banks and the senior bankers that run them. This is surely an insane way to run an economy.

These videos are based on the book 'Where does money come from?' by the New Economic Foundation. For more details on how the monetary system works, get your copy from www.positivemoney.org/book

Part 5: Is it really money, or just credit?

You might hear some people say that banks don't create money, they just create credit. This response often comes from civil servants and people trying to deny that banks now create the nation's entire money supply.

So let me show you why the numbers that banks create are money, and not just credit.

The key thing about credit is that it has something called Credit Risk.

Credit Risk is the risk that a person or company that owes you money won't pay you back.

If you lend £50 to an unreliable friend who still owes you money from the last time you lent to him, then there's a lot of credit risk attached to that loan, because it's fairly likely that he won't repay you on time. So, if the numbers that banks add to your bank account are not money but just credit then there must be some credit risk attached to that money.

In other words, there must be a risk that the bank won't be able to repay you. And of course, as we saw with Northern Rock, Wachovia and the Iceland banks there is a pretty good chance that your bank won't be able to repay you.

In fact, in a legal sense, the numbers in your bank account aren't money. They're just a promise to pay from the bank. The promise is that the bank will either give you cash when you ask for it or will electronically make payments to other banks when you ask them to.

So, that would suggest that there is credit risk attached to the numbers in your bank account because the bank may not be able to repay you. And that would suggest that the numbers banks create are not money, but just credit.

In fact, the Bank of England actually follows this argument and points out a distinction between cash and bank-created money. In their 2010 Q3 Quarterly Bulletin they say that,

“Bank of England notes ie. the cash in your pocket, are a form of central bank money which the public holds without incurring credit risk. This is because the central bank is backed by the government.”

Interesting! So, cash has no credit risk, because it is backed by the central bank, which is backed by the government. But the commercial banks aren't backed by the government. So that implies that the numbers they type into people's accounts must be credit, and not money. But hang on a minute!

The government has a scheme called the Financial Services Compensation Scheme, or FSCS. This scheme promises to repay you up to £85,000 if your bank goes bust and loses all your money. In fact, you might have seen them advertising this scheme in the tube or buses. This guarantee is supposed to be funded by contributions pooled across the banks, but if the contributions from the banks aren't enough, as happened during the financial crisis then taxpayers have to make up the rest of the money. Just think about what this means for a second.

This guarantee scheme amounts to the government saying,

“you give your money to a bank, let them do whatever they like with it, and if they lose it all, we'll just use other people's money to reimburse you and make sure you don't lose a penny.”

In what way, does this not count as the banks being backed by the government?

Here's the bottom line.

The numbers that banks type into customers' accounts would be credit and not money if and only if, there was a credible risk that you might not get all that money back. If that was the case, then bank deposits, the numbers in your account, would actually be a risky investment. Anyone putting their money into the bank would have to accept that they might lose some or all of their money. If this was the case, then banks would just be extending credit, even though their payment systems would allow you to use that credit to make payments. But because the government steps in and guarantees all this bank credit, it completely removes all the risk. In effect, the numbers that the banks create are fully backed by the government guarantee, and therefore, they don't have any credit risk.

There is absolutely no difference in the riskiness of a banknote created by the Bank of England and a number typed into a bank account by one of the high street banks.

So, to sum up, the numbers in your account are just as good, and just as safe as the cash created by the Bank of England because the numbers in your bank account are guaranteed by the government.

In other words, what banks create when they type numbers into bank accounts is money not credit.

When the government steps in to guarantee that you won't lose a penny even if your bank does something stupid, and is unable to repay you then it effectively converts the risky credit of the bank into a risk-free form of money backed up with taxpayers' funds but which the government permits private companies to create out of nothing.

By the way, probably the main reason why civil servants in the Treasury and the Banking Commission try to argue that banks can't create money is that if they acknowledge that banks had acquired the power to create money then they'd have to deal with the serious implications of giving one of the greatest powers that government has to a private short-term profit-seeking collection of corporations.

PART 6: How money gets destroyed

Remember how new money is created when a bank makes a loan.

Well, when someone repays the loan, the opposite process happens and money is actually destroyed. It effectively disappears from the economy entirely.

This is vitally important, because it means that if we, the public, start reducing our debt, by collectively borrowing less and repaying more, then the amount of money in the economy will actually start to shrink. If we all collectively reduced our debt by £1 billion, then the money supply of the economy would actually fall by £1 billion. There will be £1 billion less money changing hands in the economy.

If we significantly reduce the debt, then the shrinkage in the money supply could actually cause the economy to slow down or grind to a halt. Just think of the problems caused when banks refuse to lend during a credit crunch. So, although we all think it's a good idea to get out of debt and most of us are trying to get out of debt, as long as we keep the current system, it will be impossible to reduce our collective debt without slowing down and potentially destroying the economy.

So let's see exactly how money is destroyed when a loan is repaid.

Let's start with Robert, who still owes £10,000 to Barclays, but has spent the money leaving his bank balance at zero.

BALANCE SHEET

ASSETS The bank's money + what borrowers owe	LIABILITIES The bank's net worth + what it owes to depositors
Loan to Robert: £10,000	Robert's account: £0

After a few months, Robert decides to pay down £1,000 of the loan. He transfers the money from a bank account with another bank, to his bank account at Barclays.

We won't show you the central bank reserves in this process, because as we saw with the clearing process any change in the reserves would probably be cancelled out by payments going in the opposite direction. It won't change things in any significant way.

Now, Robert still owes £10,000 to Barclays, but also has an account with Barclays that now has a balance of £1,000. As a result, Barclays has a liability to Robert of £1,000. That's the numbers in Robert's bank balance. And Robert has a liability to Barclays of £10,000.

BALANCE SHEET

ASSETS The bank's money + what borrowers owe	LIABILITIES The bank's net worth + what it owes to depositors
Loan to Robert: £10,000	Robert's account: £1,000

When Robert calls Barclays and says that he wants to pay off £1,000 of the loan, all Barclays does is reduce Robert's bank balance to zero and reduce the outstanding loan by £1,000.

BALANCE SHEET

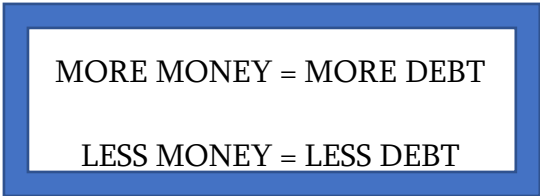
ASSETS The bank's money + what borrowers owe	LIABILITIES The bank's net worth + what it owes to depositors
Loan to Robert: £9,000	Robert's account: £0

In effect, both the assets and the liabilities are cancelled out against each other. Because the money supply in the hands of the public is made up of bank created numbers in peoples bank accounts, repaying loans in this way actually reduces the amount of money in the economy.

Money, the type of money that the public use, has been destroyed in the act of repaying the loan. Of course, now that Roberts loan has been partly repaid, Barclays might go

hunting for another lending opportunity, and make a new loan to replace this, in which case new money will be created, and the money supply will grow again. But, if banks are scared to lend, for example, following a major financial crisis, and the public are trying to reduce their debts, then the money supply of the economy will shrink.

Here it is in the simplest form. If we want more money in the economy, we need to go into more debt. And if we want less debt in the economy, we have to have less money.



MORE MONEY = MORE DEBT

LESS MONEY = LESS DEBT