

How Banks Create Money: The Balance Sheets

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1. Types of money

There are three types of money in the economy:

Cash:

Physical money, or cash, is created under the authority of the Bank of England, with coins manufactured by the Royal mint, and notes printed by specialist printer De La Rue. The profits from the creation of cash (known as seigniorage) go directly to the government. Of course, it is inconvenient and risky to use cash for larger transactions. This is one of the reasons why today cash makes up less than 3% of the total money supply. Nowadays people use credit and debit cards, which allow money to be transferred electronically between bank accounts. But who gets to create electronic money?

Central bank reserves

Central bank reserves are a type of electronic money, created by the central bank and used by banks to make payments between themselves. In some respects they are like an electronic version of cash. However, members of the public and normal businesses cannot access central bank reserves, they are only available to those organisations who have accounts at the Bank of England, i.e. banks. Central bank reserves are not usually counted as part of the money supply for the economy, due to the fact they are only used by banks to make payments between themselves.

Commercial bank money

The third type of money accounts for approximately 97% of the money supply. However, unlike central bank reserves and cash, it is not created by the central bank or any other part of government. Instead, commercial bank money is created by private, high-street or ‘commercial’ banks, usually in the process of making loans (as described below). While this money is electronic in form, it need not be – before computers, banks could still ‘create money’ by simply adding deposits to their balance sheets.

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2. A Quick Word on Balance Sheets

Because all money exists as accounting entries on the books of either high-street banks or the Bank of England, we have to understand some basic accounting so that we can understand how money is created.

The key to understanding banking is the ‘balance sheet’. This is essentially a record of:

- a) Everything the bank owns
- b) Everything that other people owe to the bank (eg. mortgages, loans, etc)
- c) Everything the bank owes to other people
- d) Whatever’s left over for the shareholders.

What the bank owns, and what people owe to the bank, is recorded as an asset of the bank:

BALANCE SHEET	
ASSETS	
What the bank owns (Branch buildings, computers, cash in their tills, government bonds, other financial assets etc)	
+	
What people owe to the bank (Loans, mortgages, overdrafts etc)	

(In fact, if you

lend £100 to a friend, your friend’s agreement to repay you can be recorded as an asset on your own personal balance sheet.) You may find it counterintuitive that a loan made by the bank is recorded as an asset; after all, once you’ve lent money, you no longer have the money, so how can you record it as an asset? However, when a loan is made, the borrower signs a contract committing to repay the full loan, plus interest. This legally binding contract is worth as much as the borrower commits to repay (assuming they will repay), and so can be considered an asset in accounting terms.

What about the other half of the balance sheet? This side is called the ‘liabilities’ of the bank.

BALANCE SHEET	
ASSETS	LIABILITIES
What the bank owns (Branch buildings, computers, cash in their tills, government bonds, other financial assets etc) + What people owe to the bank (Loans, mortgages, overdrafts etc)	Everything the bank owes to other people (or other banks) + Whatever's left for the shareholders (Shareholder equity)

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3. How Central Banks Create Money

Creating Central Bank Reserves

Let's start by seeing how the Bank of England creates the electronic money that banks use to make payments to other banks. As outlined above, *central bank reserves* are created by the central bank in order to facilitate payments between private banks.

In the following example we will show how the central bank creates central bank reserves for use by a private bank, in this case RBS. Initially the bank of England's balance sheet appears as so (this is a simplified example where we've ignored everything except this particular transaction):

BANK OF ENGLAND BALANCE SHEET - CREATING CENTRAL BANK RESERVES (STEP 1)	
ASSETS	LIABILITIES
What the bank is owed + what it owns	What the bank owes to others
£0	RBS reserve account: £0

And RBS's balance sheet is:

RBS BALANCE SHEET - CREATING CENTRAL BANK RESERVES (STEP 1)

ASSETS What the bank is owed + what it owns	LIABILITIES What the bank owes to others
Gilts: £10,000	Shareholder equity: £10,000

As a customer of the central bank, RBS contacts the central bank and informs them that they would like £10,000 in central bank reserves.

The standard method by which the Bank of England facilitates such a request is through what is known as a sale and repurchase agreement (a repo), which is essentially the same concept as a collateralised loan. Essentially RBS sells an asset to the central bank (usually a gilt) in exchange for central bank reserves, while agreeing to repurchase said asset for a specific (higher) price on a specific (future) date. If the repurchase price is 10% higher than the purchase price (i.e. £11,000) then the 'repo rate' is said to be 10%. Once the sale is completed the Bank of England has gained £10,000 of gilts, but it now has a liability to RBS of £10,000, which represents the balance of RBS's reserve account, as so:

BANK OF ENGLAND BALANCE SHEET - CREATING CENTRAL BANK RESERVES (STEP 2)

ASSETS What the bank is owed + what it owns	LIABILITIES What the bank owes to others
Gilts: £10,000	RBS reserve account: £10,000

The Bank of England's balance sheet has 'expanded' by £10,000, and £10,000 of new *central bank reserves* have been created, effectively out of nothing, in order to pay for the £10,000 in gilts.

However, from the point of view of RBSs balance sheet it has simply swapped £10,000 in gilts for £10,000 in reserves:

RBS BALANCE SHEET - CREATING CENTRAL BANK RESERVES (STEP 2)

ASSETS What the bank is owed + what it owns	LIABILITIES What the bank owes to others
Central bank reserves: £10,000	Shareholder equity: £10,000

RBS's balance sheet has not expanded at all; it has simply swapped one asset for another, without affecting its liabilities.

RBS can now use these reserves to make payments to other banks, as described below.

NB: While the above creation of currency occurred using a repo transaction, the central bank could also lend RBS the reserves (in this case the assets side of the central bank's balance sheet would show a £10,000 loan to RBS rather than £10,000 of gilts).

The Bank of England could also purchase the assets from the private bank outright – indeed, this is how the Quantitative Easing programme was conducted.

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How Central Banks Create Money (as Cash)

The process by which the central bank sells cash to banks is similar to that used for reserves. Initially the Bank of England's balance sheet appears as so:

BANK OF ENGLAND BALANCE SHEET - CREATING CASH (STEP 1)	
ASSETS What the bank is owed + what it owns	LIABILITIES What the bank owes
Gilts: £10,000	RBS reserve account: £10,000

And RBS's balance sheet appears as:

RBS BALANCE SHEET - CREATING CASH (STEP I)	
ASSETS <small>What the bank is owed + what it owns</small>	LIABILITIES <small>What the bank owes</small>
Central bank reserves: £10,000	Shareholder Equity: £10,000

If RBS decides it is expecting an increase in demand for cash – for example before a bank holiday weekend – then it may wish to exchange some of its (electronic) central bank reserves for (physical) cash. The process by which it does so is very simple – RBS simply exchanges £10,000 of its central bank reserves for £10,000 cash with the central bank.

The Bank of England’s liabilities change from £10,000 in RBS’s central reserve account, to £10,000 of ‘cash outstanding’. (The Bank of England records cash as a liability on its balance sheet, for historical reasons that we won’t go into here):

BANK OF ENGLAND BALANCE SHEET - CREATING CASH (STEP I)	
ASSETS <small>What the bank is owed + what it owns</small>	LIABILITIES <small>What the bank owes</small>
Gilts: £10,000	RBS reserve account: £0 Cash outstanding: £10,000

Meanwhile, RBS’s assets have changed from £10,000 of central bank reserves, to £10,000 in cash:

RBS BALANCE SHEET - CREATING CASH (STEP I)	
ASSETS <small>What the bank is owed + what it owns</small>	LIABILITIES <small>What the bank owes</small>
Central Bank Reserves: £0 Cash: £10,000	Shareholder Equity: £10,000

Note that neither balance sheet has expanded or contracted; it is just the nature of assets and liabilities that have changed.

When the cash is worn out, damaged, or not needed anymore, the transaction is reversed and RBS simply sells back the cash to the Bank of England at face value, receiving £10,000 in central bank reserves in return.

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4. Creating commercial bank money

Now lets look at how ‘commercial’ or high-street banks create the type of money that appears in your bank account.

Loans

A customer, who we shall call Robert, walks into RBS and asks to borrow £10,000 to buy a new car. Robert signs a contract with the bank confirming that he will repay £10,000 over a period of five years, plus interest. This legally enforceable contract represents a future income stream for the bank, and when the bank comes to draw up its balance sheet it will be included as an additional asset worth £10,000:

RBS BALANCE SHEET - LOANS (STEP 1)	
ASSETS What the bank is owed + what it owns	LIABILITIES What the bank owes
Loan to Robert: £10,000	-

Robert, having committed to pay the bank £10,000, wants to receive his ‘loan’. So RBS opens up an account for him, and types in £10,000. This is recorded as a liability on RBSs balance sheet as so:

RBS BALANCE SHEET - LOANS (STEP 2)	
ASSETS What the bank is owed + what it owns	LIABILITIES What the bank owes
Loan to Robert: £10,000	Roberts account: £10,000

Notice that no money was transferred or taken from any other account, the bank simply updated a computer database. A bank does not 'lend money' – to lend one must have money to lend in the first place. In reality a bank creates credit – money – when it advances loans.

Buying Assets

Banks also create money when they buy assets, be they real or financial. For example, say Barclays Bank wished to buy a £100 government bond from a pension fund. Initially Barclays balance sheet appears as so:

BARCLAYS BALANCE SHEET - BUYING ASSETS (STEP 1)	
ASSETS What the bank is owed + what it owns	LIABILITIES What the bank owes
£0	£0

In order to buy a bond Barclays creates an account for the pension fund, and adds £100 to the balance. In exchange the bank receives a government bond worth £100. Because Barclays owns this asset it can be placed on its balance sheet of the bank:

BARCLAYS BALANCE SHEET - BUYING ASSETS (STEP 2)

ASSETS What the bank is owed + what it owns	LIABILITIES What the bank owes
Government Bond: £100	Pension Fund's Account: £100

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5. Transferring money from one account to another

Within a bank

So far we have shown how banks create the numbers that appear in our bank accounts. These numbers are referred to as 'bank credit', 'bank deposits'. At the moment the newly-created money is simply sitting in Robert's account, but naturally Robert will want to spend the money. What happens when he does?

In the example above Robert borrowed £10,000 in order to buy a car. Once the loan was granted, Robert's bank's balance sheet appeared as so:

RBS BALANCE SHEET - INTERNAL BANK PAYMENTS (STEP 1)	
ASSETS What the bank is owed + what it owns	LIABILITIES What the bank owes
Loan to Robert: £10,000	Roberts account: £10,000

Being a fan of German engineering, Robert picks out a car which is on sale at a BMW dealership. In order to purchase the car, Robert must transfer the money from his account at RBS to BMW's bank account. If BMW also banks at RBS it is a very simple process for Robert to transfer the money to BMW. Robert simply instructs his bank to make a payment of £10,000 from his bank account to BMW's account. RBS then deducts £10,000 from Robert's account, and adds it to BMW's account, as so:

RBS BALANCE SHEET - INTERNAL BANK PAYMENTS (STEP 2)	
ASSETS What the bank is owed + what it owns	LIABILITIES What the bank owes
Loan to Robert: £10,000	Roberts account: £0 BMWS account: £10,000

However, what if Robert and BMW bank with different banks? Payments can then be made using cash or central bank reserves.

Cash Payments

If Robert and BMW bank with different banks Robert could withdraw £10,000 in cash and pay at the BMW dealership in person.

In the example balance sheets above, we've hidden everything that isn't relevant to the transaction in question. But of course, RBS doesn't only have one loan, or one customer – there will be many other assets and liabilities recorded on their balance sheet. We're going to leave most of these items hidden for now, to keep things simple, but for the next transaction, we're going to show the cash that RBS got from the Bank of England in the earlier example. We'll also reveal the shareholder equity that was there from the beginning, just so the balance sheets balance.

Any cash that the bank holds in its tills legally belongs to the bank, and therefore it appears on the asset sheet of the central bank.

RBSs balance sheet just after it has granted the £10,000 loan to Robert appears as so:

RBS BALANCE SHEET - CASH PAYMENTS (STEP 1)	
ASSETS What the bank is owed + what it owns	LIABILITIES What the bank owes
Loan to Robert: £10,000 Cash: £10,000	Roberts account: £10,000 Shareholders equity: £10,000

Robert then withdraws the £10,000 from his bank account:

RBS BALANCE SHEET - CASH PAYMENTS (STEP 2)	
ASSETS What the bank is owed + what it owns	LIABILITIES What the bank owes
Loan to Robert: £10,000 Cash: £0	Roberts account: £0 Shareholders equity: £10,000

At the point, the bank could be said to be ‘extinguishing’ its liability to Robert by repaying him in cash. Robert’s account balance of £0 shows that the bank no longer has a liability to him.

He uses the £10,000 cash to pay the BMW dealership, who banks with Lloyds. . Prior to BMW placing the £10,000 in their bank account at Lloyds, Lloyds’ balance sheet looks like this:

LLOYDS BALANCE SHEET - CASH PAYMENTS (STEP 1)	
ASSETS What the bank is owed + what it owns	LIABILITIES What the bank owes
£0	BMWs account: £0

When BMW deposit the money in their bank account they add £10,000 to their cash reserves (as they now own this cash), and increase their liabilities to BMW by £10,000:

LLOYDS BALANCE SHEET - CASH PAYMENTS (STEP 2)	
ASSETS What the bank is owed + what it owns	LIABILITIES What the bank owes
Cash: £10,000	BMWs account: £10,000

Central Bank Reserve Payments

Of course, making payments in cash is highly inconvenient not to mention potentially dangerous. As such, payments for large amounts of money tend to be made electronically, using central bank reserves.

In the same way that you or I may have a bank account with a private bank, private banks have bank accounts at the central bank, known as reserve accounts. Reserve accounts hold a special type of money known as central bank reserves, which can be thought of as being an electronic form of cash created by the central bank. Central bank reserves are used to make payments between banks electronically. So, if Robert and the BMW dealership bank with different banks, the payment could be made by electronic transfer using these reserves.

To show how banks make payments using reserves, we must first include central bank reserves on RBS's balance sheet. We'll also reveal shareholder equity so that the balance sheet balances. (Again, this is a simplified example with everything else hidden for simplicity).

RBS's balance sheet just after it has granted the £10,000 loan to Robert appears as so:

RBS BALANCE SHEET - RESERVES PAYMENTS (STEP 1)	
ASSETS What the bank is owed + what it owns	LIABILITIES What the bank owes
Loan to Robert £10,000 Central bank reserves: £10,000	Roberts account: £10,000 Shareholder equity: £10,000

Meanwhile Lloyds' Balance sheet is:

LLOYDS' BALANCE SHEET - RESERVE PAYMENTS (STEP 1)	
ASSETS What the bank is owed + what it owns	LIABILITIES What the bank owes
£0	BMW'S account: £0

Robert then instructs RBS to make a payment of £10,000 to BMW's bank account. Upon receiving this instruction, RBS reduces the balance of Robert's account, and transfers the reserves to Lloyds bank:

RBS BALANCE SHEET - RESERVES PAYMENTS (STEP 2)

ASSETS	LIABILITIES
What the bank is owed + what it owns	What the bank owes
Loan to Robert £10,000 Central bank reserves: £0	Roberts account: £0 Shareholder equity: £10,000

Upon receiving the transfer of central bank reserves, Lloyds' credits BMW's account with £10,000, finishing the transaction:

LLOYDS BALANCE SHEET - RESERVES PAYMENTS (STEP 2)

ASSETS	LIABILITIES
What the bank is owed + what it owns	What the bank owes
Central bank reserves: £10,000	BMW's account: £10,000

Let's look at the same transfer of reserves from the perspective of the Bank of England's balance sheet. With both banks banking at the Bank of England, transferring reserves between reserve accounts is the same as when two individuals at the same bank make a payment to each other; a liability to one customer becomes a liability to another customer. However, while reserves appear as an asset on the balance sheet of private banks, they are a liability of the central bank (just as your bank balance is actually a liability of the bank). Before the payment is made from RBS to Lloyds, the reserve accounts appear as so:

BANK OF ENGLAND BALANCE SHEET - RESERVES PAYMENTS (STEP 1)

ASSETS	LIABILITIES
What the bank is owed + what it owns	What the bank owes
Gilts: £10,000	RBS reserve account: £10,000 Lloyds reserve account: £0

Robert then instructs RBS to transfer £10,000 from his bank account to the BMW dealer's account at Lloyds. To do so, RBS will contact the Bank of England (electronically), asking them to transfer £10,000 from its reserve account to Lloyds bank account:

BANK OF ENGLAND BALANCE SHEET - RESERVES PAYMENTS (STEP 2)	
ASSETS What the bank is owed + what it owns	LIABILITIES What the bank owes
Gilts: £10,000	RBS reserve account: £0 Lloyds reserve account: £10,000

Once Lloyds receives confirmation that the reserves have been transferred, they will credit the BMW dealer's account, as before.

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6. Destroying money

As we have seen, when banks make loans, new money (in the form of numbers in somebody's bank account) is created.

What happens when these loans are repaid? Exactly the opposite – money is destroyed. The principle is the same for all electronic money. This section explains it in terms of commercial bank money.

In the example from before, Robert borrowed £10,000 to buy a car. Let's imagine that he now wishes to repay this loan. (To keep this example simple, we will imagine the loan being repaid in one lump sum, rather than in instalments as is usually the case.)

Recall the situation directly after Robert bought his BMW: the bank has an asset of £10,000, which is its loan to Robert, and some unspecified liabilities totalling the same amount. Robert has a debt to his bank of £10,000:

RBS BALANCE SHEET - LOAN REPAYMENT (STEP 1)	
ASSETS What the bank is owed + what it owns	LIABILITIES What the bank owes
Loan to Robert £10,000 Central bank reserves: £0	Roberts account: £0 Shareholder equity: £10,000

After working for a few months Robert is paid £11,000 by his employer (forgive the simplification for example's sake!). This payment is made from Robert's employer's bank account to Robert's account electronically – RBS gains an asset (£11,000 in reserves) and so increases Robert's account by the same amount:

RBS BALANCE SHEET - LOAN REPAYMENT (STEP 2)	
ASSETS What the bank is owed + what it owns	LIABILITIES What the bank owes
Loan to Robert £10,000 Central bank reserves: £11,000	Roberts account: £11,000 Shareholder equity: £10,000

Robert decides to use the £11,000 to repay his loan in full, with interest. With an interest rate of 10% on the loan, Robert owes £11,000 in total, £1,000 of which is interest. Robert informs RBS that he wishes to repay the loan in full, with interest. From Robert's perspective, he sees that the £11,000 is 'taken out' of his account by RBS. However, in reality, no money is moved at all. RBS simply decreases its liability to Robert (i.e. his bank balance) by £11,000, and simultaneously removes the £10,000 loan from its assets, because the loan has been 'repaid':

RBS BALANCE SHEET - LOAN REPAYMENT (STEP 3)	
ASSETS What the bank is owed + what it owns	LIABILITIES What the bank owes
Loan to Robert £0 Central bank reserves: £11,000	Roberts account: £0 Shareholder equity: £11,000

Robert now has no money in his bank account (RBS's liability to him is zero). He also has no debt. RBS's assets have increased from £10,000 when they made the loan, to £11,000 now the loan has been repaid. RBS's liabilities have also increased from £10,000 to £11,000, however. As a result, if the bank were to now close down and sell off all their assets and settle all their liabilities, the shareholders would have £1,000 more than they had before the loan was made – this is their profit.

Of course, in reality the bank doesn't close. Instead this increase in shareholder equity is likely to be used to pay dividends to shareholders, pay staff etc. For example, RBS may take the £1000 in profit and divide it equally between shareholders and staff as so:

RBS BALANCE SHEET - DISBURSING PROFITS (STEP 4)

ASSETS What the bank is owed + what it owns	LIABILITIES What the bank owes
Loan to Robert £0 Central bank reserves: £11,000	Roberts account: £0 Shareholders a/cs: £500 Staff salaries: £500 Shareholder equity: £10,000

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In Summary:

Let's review the key points that we have learnt:

- The 'money' in your bank account does not represent physical cash that you can hold in your hand; it is simply an accounting liability from the bank to you, and only exists as a number in a computer system.
- We now use these bank liabilities / accounting entries to make payments for over 99% of all transactions (by value). Therefore we could describe bank liabilities, bank credit and bank deposits (which are all the same thing) as being equivalent to money in the modern day.
- Banks create bank deposits (the money in your account) when they make loans. They add liabilities to the borrower's account, and simultaneously add an asset (the loan contract) to their balance sheet.
- The repayable principal of the loan is recorded as an asset. However, the interest payable isn't recorded as an asset on the balance sheet, but is just recorded as a profit as and when the interest is paid.
- The money that banks use to pay each other – central bank reserves – is itself created out of nothing as an accounting entry by the Bank of England. The liability that the Bank of England creates to the commercial bank is balanced out by the asset that the bank posts as 'collateral'.

In summary, what we now use as 'money' – the numbers in our account – is simply accounting entries made by banks. These accounting entries make up over 97% of all the money that we use today.