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Money creation in the modern economy

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- This article explains how the majority of money in the modern economy is created by commercial banks making loans.
- Money creation in practice differs from some popular misconceptions — banks do not act simply as intermediaries, lending out deposits that savers place with them, and nor do they 'multiply up' central bank money to create new loans and deposits.
- The amount of money created in the economy ultimately depends on the monetary policy of the central bank. In normal times, this is carried out by setting interest rates. The central bank can also affect the amount of money directly through purchasing assets or 'quantitative easing'.

Overview

In the modern economy, most money takes the form of bank deposits. But how those bank deposits are created is often misunderstood: the principal way is through commercial banks making loans. **Whenever a bank makes a loan, it simultaneously creates a matching deposit in the borrower's bank account, thereby creating new money.**

The reality of how money is created today differs from the description found in some economics textbooks:

- Rather than banks receiving deposits when households save and then lending them out, bank lending creates deposits.
- In normal times, the central bank does not fix the amount of money in circulation, nor is central bank money 'multiplied up' into more loans and deposits.

Although commercial banks create money through lending, they cannot do so freely without limit. Banks are limited in how much they can lend if they are to remain profitable in a competitive banking system. Prudential regulation also acts as a constraint on banks' activities in order to maintain the resilience of the financial system. And the households and companies who receive the money created by new lending may take actions that affect the stock of money — they could quickly 'destroy' money by using it to repay their existing debt, for instance.

Monetary policy acts as the ultimate limit on money creation. The Bank of England aims to make sure the amount of money creation in the economy is consistent with

low and stable inflation. In normal times, the Bank of England implements monetary policy by setting the interest rate on central bank reserves. This then influences a range of interest rates in the economy, including those on bank loans.

In exceptional circumstances, when interest rates are at their effective lower bound, money creation and spending in the economy may still be too low to be consistent with the central bank's monetary policy objectives. One possible response is to undertake a series of asset purchases, or 'quantitative easing' (QE). QE is intended to boost the amount of money in the economy directly by purchasing assets, mainly from non-bank financial companies.

QE initially increases the amount of bank deposits those companies hold (in place of the assets they sell). Those companies will then wish to rebalance their portfolios of assets by buying higher-yielding assets, raising the price of those assets and stimulating spending in the economy.

As a by-product of QE, new central bank reserves are created. But these are not an important part of the transmission mechanism. This article explains how, just as in normal times, these reserves cannot be multiplied into more loans and deposits and how these reserves do not represent 'free money' for banks.

[Click here for a short video filmed in the Bank's gold vaults that discusses some of the key topics from this article.](#)

(1) The authors would like to thank Lewis Kirkham for his help in producing this article.

Introduction

'Money in the modern economy: an introduction', a companion piece to this article, provides an overview of what is meant by money and the different types of money that exist in a modern economy, briefly touching upon how each type of money is created. This article explores money creation in the modern economy in more detail.

The article begins by outlining two common misconceptions about money creation, and explaining how, in the modern economy, money is largely created by commercial banks making loans.⁽¹⁾ The article then discusses the limits to the banking system's ability to create money and the important role for central bank policies in ensuring that credit and money growth are consistent with monetary and financial stability in the economy. The final section discusses the role of money in the monetary transmission mechanism during periods of quantitative easing (QE), and dispels some myths surrounding money creation and QE. A short video explains some of the key topics covered in this article.⁽²⁾

Two misconceptions about money creation

The vast majority of money held by the public takes the form of bank deposits. But where the stock of bank deposits comes from is often misunderstood. **One common misconception is that banks act simply as intermediaries, lending out the deposits that savers place with them.** In this view deposits are typically 'created' by the saving decisions of households, and banks then 'lend out' those existing deposits to borrowers, for example to companies looking to finance investment or individuals wanting to purchase houses.

In fact, when households choose to save more money in bank accounts, those deposits come simply at the expense of deposits that would have otherwise gone to companies in payment for goods and services. Saving does not by itself increase the deposits or 'funds available' for banks to lend. Indeed, viewing banks simply as intermediaries ignores the fact that, in reality in the modern economy, commercial banks are the creators of deposit money. This article explains how, rather than banks lending out deposits that are placed with them, the act of lending creates deposits — the reverse of the sequence typically described in textbooks.⁽³⁾

Another common misconception is that the central bank determines the quantity of loans and deposits in the economy by controlling the quantity of central bank money — the so-called 'money multiplier' approach. In that view, central banks implement monetary policy by choosing a quantity of reserves. And, because there is assumed to be a constant ratio of broad money to base money, these reserves are then 'multiplied up' to a much greater change in bank

loans and deposits. For the theory to hold, the amount of reserves must be a binding constraint on lending, and the central bank must directly determine the amount of reserves. While the money multiplier theory can be a useful way of introducing money and banking in economic textbooks, it is not an accurate description of how money is created in reality. Rather than controlling the quantity of reserves, central banks today typically implement monetary policy by setting the price of reserves — that is, interest rates.

In reality, neither are reserves a binding constraint on lending, nor does the central bank fix the amount of reserves that are available. As with the relationship between deposits and loans, the relationship between reserves and loans typically operates in the reverse way to that described in some economics textbooks. Banks first decide how much to lend depending on the profitable lending opportunities available to them — which will, crucially, depend on the interest rate set by the Bank of England. It is these lending decisions that determine how many bank deposits are created by the banking system. The amount of bank deposits in turn influences how much central bank money banks want to hold in reserve (to meet withdrawals by the public, make payments to other banks, or meet regulatory liquidity requirements), which is then, in normal times, supplied on demand by the Bank of England. The rest of this article discusses these practices in more detail.

Money creation in reality

Lending creates deposits — broad money determination at the aggregate level

As explained in 'Money in the modern economy: an introduction', broad money is a measure of the total amount of money held by households and companies in the economy. Broad money is made up of bank deposits — which are essentially IOUs from commercial banks to households and companies — and currency — mostly IOUs from the central bank.⁽⁴⁾⁽⁵⁾ Of the two types of broad money, bank deposits make up the vast majority — 97% of the amount currently in circulation.⁽⁶⁾ **And in the modern economy, those bank deposits are mostly created by commercial banks themselves.**

(1) Throughout this article, 'banks' and 'commercial banks' are used to refer to banks and building societies together.

(2) See www.youtube.com/watch?v=CvRAqR2pAgw.

(3) There is a long literature that does recognise the 'endogenous' nature of money creation in practice. See, for example, Moore (1988), Howells (1995) and Palley (1996).

(4) The definition of broad money used by the Bank of England, $M4^{EX}$, also includes a wider range of bank liabilities than regular deposits; see Burgess and Janssen (2007) for more details. For simplicity, this article describes all of these liabilities as deposits. A box later in this article provides details about a range of popular monetary aggregates in the United Kingdom.

(5) Around 6% of the currency in circulation is made up of coins, which are produced by The Royal Mint. Of the banknotes that circulate in the UK economy, some are issued by some Scottish and Northern Irish commercial banks, although these are fully matched by Bank of England money held at the Bank.

(6) As of December 2013.

Commercial banks create money, in the form of bank deposits, by making new loans. When a bank makes a loan, for example to someone taking out a mortgage to buy a house, it does not typically do so by giving them thousands of pounds worth of banknotes. Instead, it credits their bank account with a bank deposit of the size of the mortgage. **At that moment, new money is created.** For this reason, some economists have referred to bank deposits as ‘fountain pen money’, created at the stroke of bankers’ pens when they approve loans.⁽¹⁾

This process is illustrated in **Figure 1**, which shows how new lending affects the balance sheets of different sectors of the economy (similar balance sheet diagrams are introduced in ‘Money in the modern economy: an introduction’). As shown in the third row of **Figure 1**, the new deposits increase the assets of the consumer (here taken to represent households and companies) — the extra red bars — and the new loan increases their liabilities — the extra white bars. New broad money has been created. Similarly, both sides of the commercial banking sector’s balance sheet increase as new money and loans are created. It is important to note that although the simplified diagram of **Figure 1** shows the amount of new money created as being identical to the amount of new lending, in practice there will be several factors that may subsequently cause the amount of deposits to be different from the amount of lending. These are discussed in detail in the next section.

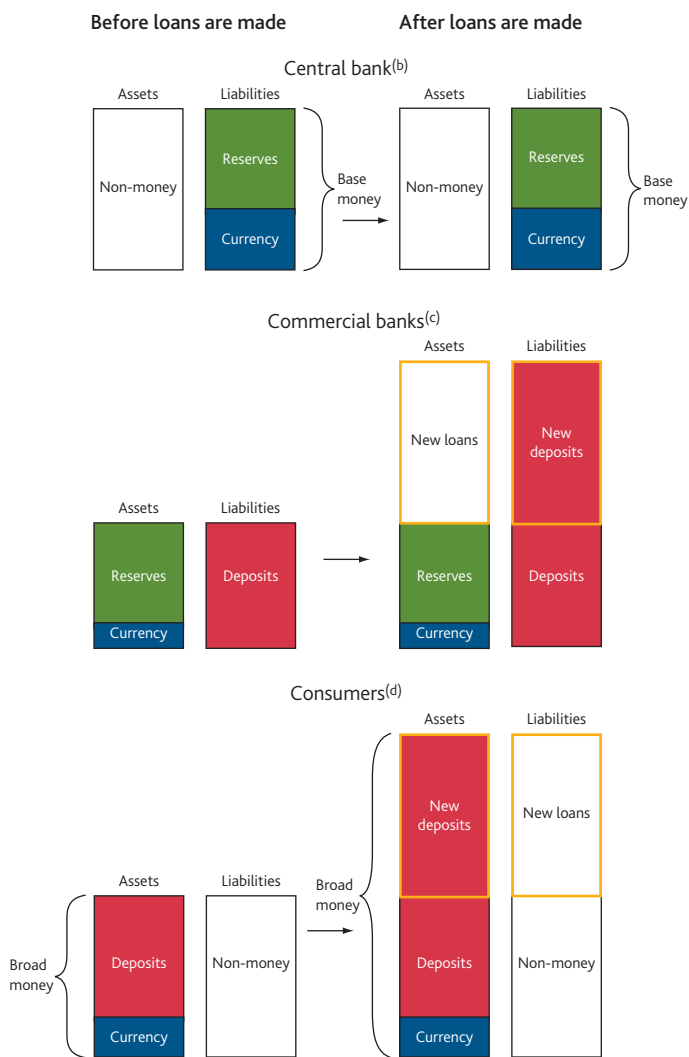
While new broad money has been created on the consumer’s balance sheet, the first row of **Figure 1** shows that this is without — in the first instance, at least — any change in the amount of central bank money or ‘base money’. As discussed earlier, the higher stock of deposits may mean that banks want, or are required, to hold more central bank money in order to meet withdrawals by the public or make payments to other banks. And reserves are, in normal times, supplied ‘on demand’ by the Bank of England to commercial banks in exchange for other assets on their balance sheets. In no way does the aggregate *quantity* of reserves directly constrain the amount of bank lending or deposit creation.

This description of money creation contrasts with the notion that banks can only lend out pre-existing money, outlined in the previous section. Bank deposits are simply a record of how much the bank itself owes its customers. So they are a *liability* of the bank, not an *asset* that could be lent out. A related misconception is that banks can lend out their reserves. Reserves can only be lent *between banks*, since consumers do not have access to reserves accounts at the Bank of England.⁽²⁾

Other ways of creating and destroying deposits

Just as taking out a new loan creates money, the repayment of bank loans destroys money.⁽³⁾ For example, suppose a consumer has spent money in the supermarket throughout the month by using a credit card. Each purchase made using the

Figure 1 Money creation by the aggregate banking sector making additional loans^(a)



- (a) Balance sheets are highly stylised for ease of exposition: the quantities of each type of money shown do not correspond to the quantities actually held on each sector’s balance sheet.
- (b) Central bank balance sheet only shows base money liabilities and the corresponding assets. In practice the central bank holds other non-money liabilities. Its non-monetary assets are mostly made up of government debt. Although that government debt is actually held by the Bank of England Asset Purchase Facility, so does not appear directly on the balance sheet.
- (c) Commercial banks’ balance sheets only show money assets and liabilities before any loans are made.
- (d) Consumers represent the private sector of households and companies. Balance sheet only shows broad money assets and corresponding liabilities — real assets such as the house being transacted are not shown. Consumers’ non-money liabilities include existing secured and unsecured loans.

credit card will have increased the outstanding loans on the consumer’s balance sheet and the deposits on the supermarket’s balance sheet (in a similar way to that shown in **Figure 1**). If the consumer were then to pay their credit card

- (1) Fountain pen money is discussed in Tobin (1963), who mentions it in the context of making an argument that banks cannot create unlimited amounts of money in practice.
- (2) Part of the confusion may stem from some economists’ use of the term ‘reserves’ when referring to ‘excess reserves’ — balances held above those required by regulatory reserve requirements. In this context, ‘lending out reserves’ could be a shorthand way of describing the process of increasing lending and deposits until the bank reaches its maximum ratio. As there are no reserve requirements in the United Kingdom the process is less relevant for UK banks.
- (3) The fall in bank lending in the United Kingdom since 2008 is an important reason why the growth of money in the economy has been so much lower than in the years leading up to the crisis, as discussed in Bridges, Rossiter and Thomas (2011) and Butt *et al* (2012).

bill in full at the end of the month, its bank would reduce the amount of deposits in the consumer's account by the value of the credit card bill, thus destroying all of the newly created money.

Banks making loans and consumers repaying them are the most significant ways in which bank deposits are created and destroyed in the modern economy. But they are far from the only ways. Deposit creation or destruction will also occur any time the banking sector (including the central bank) buys or sells existing assets from or to consumers, or, more often, from companies or the government.

Banks buying and selling government bonds is one particularly important way in which the purchase or sale of existing assets by banks creates and destroys money. Banks often buy and hold government bonds as part of their portfolio of liquid assets that can be sold on quickly for central bank money if, for example, depositors want to withdraw currency in large amounts.⁽¹⁾ When banks purchase government bonds from the non-bank private sector they credit the sellers with bank deposits.⁽²⁾ And, as discussed later in this article, central bank asset purchases, known as quantitative easing (QE), have similar implications for money creation.

Money can also be destroyed through the issuance of long-term debt and equity instruments by banks. In addition to deposits, banks hold other liabilities on their balance sheets. Banks manage their liabilities to ensure that they have at least some capital and longer-term debt liabilities to mitigate certain risks and meet regulatory requirements. Because these 'non-deposit' liabilities represent longer-term investments in the banking system by households and companies, they cannot be exchanged for currency as easily as bank deposits, and therefore increase the resilience of the bank. When banks issue these longer-term debt and equity instruments to non-bank financial companies, those companies pay for them with bank deposits. That reduces the amount of deposit, or money, liabilities on the banking sector's balance sheet and increases their non-deposit liabilities.⁽³⁾

Buying and selling of existing assets and issuing longer-term liabilities may lead to a gap between lending and deposits in a closed economy. Additionally, in an open economy such as the United Kingdom, deposits can pass from domestic residents to overseas residents, or sterling deposits could be converted into foreign currency deposits. These transactions do not destroy money *per se*, but overseas residents' deposits and foreign currency deposits are not always counted as part of a country's money supply.

Limits to broad money creation

Although commercial banks create money through their lending behaviour, they cannot in practice do so without limit. In particular, the price of loans — that is, the interest rate (plus

any fees) charged by banks — determines the amount that households and companies will want to borrow. A number of factors influence the price of new lending, not least the monetary policy of the Bank of England, which affects the level of various interest rates in the economy.

The limits to money creation by the banking system were discussed in a paper by Nobel Prize winning economist James Tobin and this topic has recently been the subject of debate among a number of economic commentators and bloggers.⁽⁴⁾ In the modern economy there are three main sets of constraints that restrict the amount of money that banks can create.

(i) **Banks themselves face limits on how much they can lend.** In particular:

- Market forces constrain lending because individual banks have to be able to lend profitably in a competitive market.
- Lending is also constrained because banks have to take steps to mitigate the risks associated with making additional loans.
- Regulatory policy acts as a constraint on banks' activities in order to mitigate a build-up of risks that could pose a threat to the stability of the financial system.

(ii) **Money creation is also constrained by the behaviour of the money holders — households and businesses.** Households and companies who receive the newly created money might respond by undertaking transactions that immediately destroy it, for example by repaying outstanding loans.

(iii) **The ultimate constraint on money creation is monetary policy.** By influencing the level of interest rates in the economy, the Bank of England's monetary policy affects how much households and companies want to borrow. This occurs both directly, through influencing the loan rates charged by banks, but also indirectly through the overall effect of monetary policy on economic activity in

(1) It is for this reason that holdings of some government bonds are counted towards meeting prudential liquidity requirements, as described in more detail by Farag, Harland and Nixon (2013).

(2) In a balance sheet diagram such as Figure 1, a purchase of government bonds from consumers by banks would be represented by a change in the composition of consumers' assets from government bonds to deposits and an increase in both deposits and government bonds on the commercial banks' balance sheet.

(3) Commercial banks' purchases of government bonds and their issuance of long-term debt and equity have both been important influences on broad money growth during the financial crisis as discussed in Bridges, Rossiter and Thomas (2011) and Butt *et al* (2012).

(4) Tobin (1963) argued that banks do not possess a 'widow's cruse', referring to a biblical story (earlier referenced in economics by John Maynard Keynes) in which a widow is able to miraculously refill a cruse (a pot or jar) of oil during a famine. Tobin was arguing that there were limits to how many loans could be automatically matched by deposits.

the economy. As a result, the Bank of England is able to ensure that money growth is consistent with its objective of low and stable inflation.

The remainder of this section explains how each of these mechanisms work in practice.

(i) Limits on how much banks can lend

Market forces facing individual banks

Figure 1 showed how, for the *aggregate* banking sector, loans are initially created with matching deposits. But that does not mean that any given *individual* bank can freely lend and create money without limit. That is because banks have to be able to lend profitably in a competitive market, and ensure that they adequately manage the risks associated with making loans.

Banks receive interest payments on their assets, such as loans, but they also generally have to pay interest on their liabilities, such as savings accounts. A bank's business model relies on receiving a higher interest rate on the loans (or other assets) than the rate it pays out on its deposits (or other liabilities). Interest rates on both banks' assets and liabilities depend on the policy rate set by the Bank of England, which acts as the ultimate constraint on money creation. The commercial bank uses the difference, or spread, between the expected return on their assets and liabilities to cover its operating costs and to make profits.⁽¹⁾ In order to make extra loans, an individual bank will typically have to lower its loan rates relative to its competitors to induce households and companies to borrow more. And once it has made the loan it may well 'lose' the deposits it has created to those competing banks. Both of these factors affect the profitability of making a loan for an individual bank and influence how much borrowing takes place.

For example, suppose an individual bank lowers the rate it charges on its loans, and that attracts a household to take out a mortgage to buy a house. The moment the mortgage loan is made, the household's account is credited with new deposits. And once they purchase the house, they pass their new deposits on to the house seller. This situation is shown in the first row of Figure 2. The buyer is left with a new asset in the form of a house and a new liability in the form of a new loan. The seller is left with money in the form of bank deposits instead of a house. It is more likely than not that the seller's account will be with a different bank to the buyer's. So when the transaction takes place, the new deposits will be transferred to the seller's bank, as shown in the second row of Figure 2. The buyer's bank would then have fewer deposits than assets. In the first instance, the buyer's bank settles with the seller's bank by transferring reserves. But that would leave the buyer's bank with fewer reserves and more loans relative to its deposits than before. This is likely to be problematic for the bank since it would increase the risk that it would not be able to meet all of its likely outflows. And, in practice, banks

make many such loans every day. So if a given bank financed all of its new loans in this way, it would soon run out of reserves.

Banks therefore try to attract or retain additional liabilities to accompany their new loans. In practice other banks would also be making new loans and creating new deposits, so one way they can do this is to try and attract some of those newly created deposits. In a competitive banking sector, that may involve increasing the rate they offer to households on their savings accounts. By attracting new deposits, the bank can increase its lending without running down its reserves, as shown in the third row of Figure 2. Alternatively, a bank can borrow from other banks or attract other forms of liabilities, at least temporarily. But whether through deposits or other liabilities, **the bank would need to make sure it was attracting and retaining some kind of funds in order to keep expanding lending.** And the cost of that needs to be measured against the interest the bank expects to earn on the loans it is making, which in turn depends on the level of Bank Rate set by the Bank of England. For example, if a bank continued to attract new borrowers and increase lending by reducing mortgage rates, and sought to attract new deposits by increasing the rates it was paying on its customers' deposits, it might soon find it unprofitable to keep expanding its lending. Competition for loans and deposits, and the desire to make a profit, therefore limit money creation by banks.

Managing the risks associated with making loans

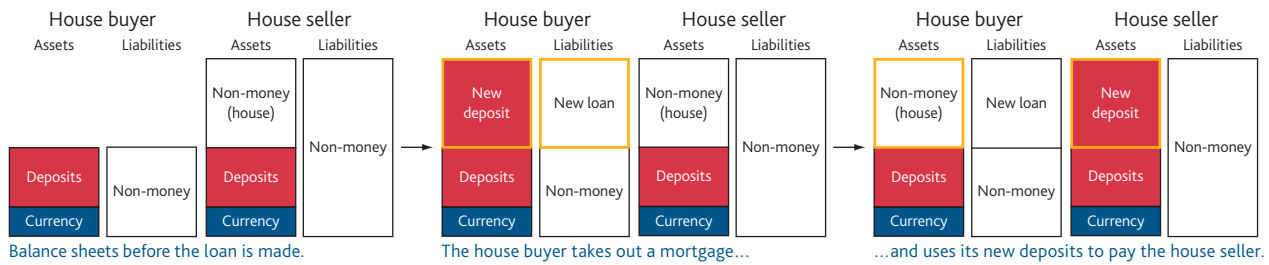
Banks also need to manage the risks associated with making new loans. One way in which they do this is by making sure that they attract relatively *stable* deposits to match their new loans, that is, deposits that are unlikely or unable to be withdrawn in large amounts. This can act as an additional limit to how much banks can lend. For example, if all of the deposits that a bank held were in the form of instant access accounts, such as current accounts, then the bank might run the risk of lots of these deposits being withdrawn in a short period of time. Because banks tend to lend for periods of many months or years, the bank may not be able to repay all of those deposits — it would face a great deal of **liquidity risk**. In order to reduce liquidity risk, banks try to make sure that some of their deposits are fixed for a certain period of time, or term.⁽²⁾ Consumers are likely to require compensation for the inconvenience of holding longer-term deposits, however, so these are likely to be more costly for banks, limiting the amount of lending banks wish to do. And as discussed earlier, if banks guard against liquidity risk by issuing long-term liabilities, this may destroy money directly when companies pay for them using deposits.

(1) See Button, Pezzini and Rossiter (2010) for an explanation of how banks price new loans.

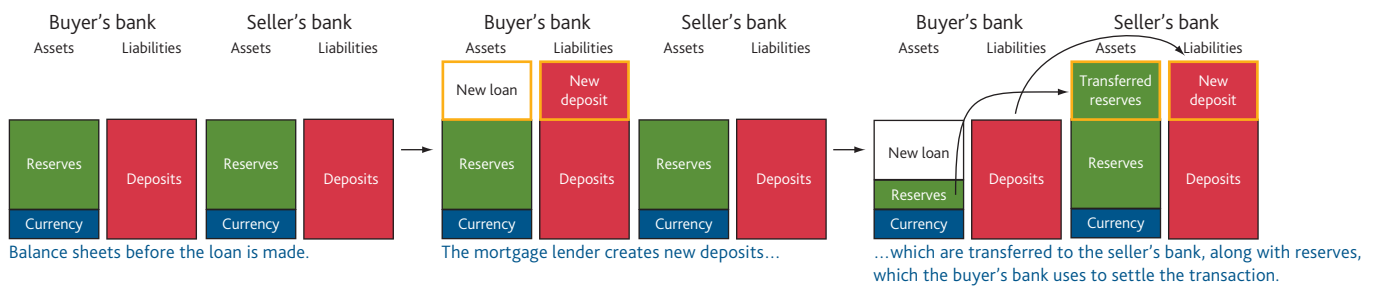
(2) Banks also guard against liquidity risk by holding liquid assets (including reserves and currency), which either can be used directly to cover outflows, or if not can quickly and cheaply be converted into assets that can. Although if banks purchase liquid assets such as government bonds from non-banks, this could create further deposits.

Figure 2 Money creation for an individual bank making an additional loan^(a)

Changes to the balance sheets of the house buyer and seller

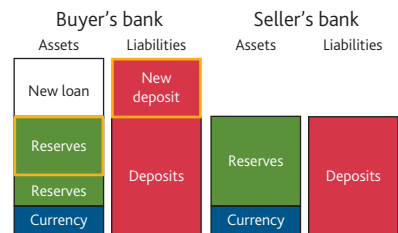


Changes to the balance sheets of the house buyer and seller's banks



But settling all transactions in this way would be unsustainable:

- The buyer's bank would have fewer reserves to meet its possible outflows, for example from deposit withdrawals.
- And if it made many new loans it would eventually run out of reserves.



So the buyer's bank will in practice seek to attract or retain new deposits (and reserves) — in the example shown here, from the seller's bank — to accompany their new loans.

(a) Balance sheets are highly stylised for ease of exposition: the quantities of each type of money shown do not correspond to the quantities actually held on each sector's balance sheet.

Individual banks' lending is also limited by considerations of **credit risk**. This is the risk to the bank of lending to borrowers who turn out to be unable to repay their loans. In part, banks can guard against credit risk by having sufficient capital to absorb any unexpected losses on their loans. But since loans will always involve some risk to banks of incurring losses, the cost of these losses will be taken into account when pricing loans. When a bank makes a loan, the interest rate it charges will typically include compensation for the average level of credit losses the bank expects to suffer. The size of this component of the interest rate will be larger when banks estimate that they will suffer higher losses, for example when lending to mortgagors with a high loan to value ratio. As banks expand lending, their average expected loss per loan is likely to increase, making those loans less profitable. This further limits the amount of lending banks can profitably do, and the money they can therefore create.

Market forces do not always lead individual banks to sufficiently protect themselves against liquidity and credit risks. Because of this, prudential regulation aims to ensure that banks do not take excessive risks when making new loans, including via requirements for banks' capital and liquidity positions. These requirements can therefore act as an additional brake on how much money commercial banks create by lending. The prudential regulatory framework, along with more detail on capital and liquidity, is described in Farag, Harland and Nixon (2013).

So far this section has considered the case of an individual bank making additional loans by offering competitive interest rates — both on its loans and deposits. But if *all* banks simultaneously decide to try to do more lending, money growth may not be limited in quite the same way. Although an individual bank may lose deposits to other banks, it would itself be likely to gain some deposits as a result of the other banks making loans.

There are a number of reasons why many banks may choose to increase their lending markedly at the same time. For example, the profitability of lending at given interest rates could increase because of a general improvement in economic conditions. Alternatively, banks may decide to lend more if they perceive the risks associated with making loans to households and companies to have fallen. This sort of development is sometimes argued to be one of the reasons why bank lending expanded so much in the lead up to the financial crisis.⁽¹⁾ But if that perception of a less risky environment were unwarranted, the result could be a more fragile financial system.⁽²⁾ One of the responses to the crisis in the United Kingdom has been the creation of a macroprudential authority, the Financial Policy Committee, to identify, monitor and take action to reduce or remove risks which threaten the resilience of the financial system as a whole.⁽³⁾

(ii) Constraints arising from the response of households and companies

In addition to the range of constraints facing banks that act to limit money creation, the behaviour of households and companies *in response* to money creation by the banking sector can also be important, as argued by Tobin. The behaviour of the non-bank private sector influences the ultimate impact that credit creation by the banking sector has on the stock of money because more (or less) money may be created than they wish to hold relative to other assets (such as property or shares). As the households and companies who take out loans do so because they want to spend more, they will quickly pass that money on to others as they do so. How *those* households and companies then respond will determine the stock of money in the economy, and potentially have implications for spending and inflation.

There are two main possibilities for what could happen to newly created deposits. First, as suggested by Tobin, the money may quickly be destroyed if the households or companies receiving the money after the loan is spent wish to use it to repay their own outstanding bank loans. This is sometimes referred to as the 'reflux theory'.⁽⁴⁾ For example, a first-time house buyer may take out a mortgage to purchase a house from an elderly person who, in turn, repays their existing mortgage and moves in with their family. As discussed earlier, repaying bank loans destroys money just as making loans creates it. So, in this case, the balance sheet of consumers in the economy would be returned to the position it was in before the loan was made.

The second possible outcome is that the extra money creation by banks can lead to more spending in the economy. For newly created money to be destroyed, it needs to pass to households and companies with existing loans who want to repay them. But this will not always be the case, since asset and debt holdings tend to vary considerably across individuals

in the economy.⁽⁵⁾ Instead, the money may initially pass to households or companies with positive holdings of financial assets: the elderly person may have already paid off their mortgage, or a company receiving money as a payment may already have sufficient liquid assets to cover possible outgoings. They may then be left holding more money than they desire, and attempt to reduce their 'excess' money holdings by increasing their spending on goods and services. (In the case of a company it may instead buy other, higher-yielding, assets.)

These two scenarios for what happens to newly created money — being quickly destroyed or being passed on via spending — have very different implications for economic activity. In the latter, the money may continue to be passed between different households and companies each of whom may, in turn, increase their spending. This process — sometimes referred to as the 'hot potato' effect — can lead, other things equal, to increased inflationary pressure on the economy.⁽⁶⁾ In contrast, if the money is quickly destroyed as in the former scenario, there need be no further effects on the economy.

This section has so far discussed how the actions of banks, households and companies can affect the amount of money in the economy, and therefore inflationary pressure. But the ultimate determinant of monetary conditions in the economy is the monetary policy of the central bank.

(iii) Monetary policy — the ultimate constraint on money creation

One of the Bank of England's primary objectives is to ensure monetary stability by keeping consumer price inflation on track to meet the 2% target set by the Government. And, as discussed in the box on pages 9–10, over some periods of time, various measures of money have grown at a similar rate to nominal spending, which determines inflationary pressure in the economy in the medium term. So setting monetary policy appropriately to meet the inflation target should ultimately ensure a stable rate of credit and money creation consistent with meeting that target. This section explains the relationship between monetary policy and different types of money.

In normal times, the Monetary Policy Committee (MPC), like most of its equivalents in other countries, implements monetary policy by setting short-term interest rates, specifically by setting the interest rate paid on central bank reserves held by commercial banks. It is able to do so because

(1) See, for example, Haldane (2009).

(2) Tucker (2009) discusses the possibility of such 'risk illusion' in the financial system.

(3) Tucker, Hall and Pattani (2013) describe the new powers for macroprudential policymaking in the United Kingdom in the wake of the recent financial crisis.

(4) See Kaldor and Trevithick (1981).

(5) See Kamath *et al* (2011).

(6) This mechanism is explained in more detail in papers including Laidler (1984), Congdon (1992, 2005), Howells (1995), Laidler and Robson (1995), Bridges, Rossiter and Thomas (2011) and Bridges and Thomas (2012).

of the Bank's position as the monopoly provider of central bank money in the United Kingdom. And it is because there is demand for central bank money — the ultimate means of settlement for banks, the creators of broad money — that the price of reserves has a meaningful impact on other interest rates in the economy.

The interest rate that commercial banks can obtain on money placed at the central bank influences the rate at which they are willing to lend on similar terms in sterling money markets — the markets in which the Bank and commercial banks lend to each other and other financial institutions. The exact details of how the Bank uses its money market operations to implement monetary policy has varied over time, and central bank operating procedures today differ somewhat from country to country, as discussed in Clews, Salmon and Weeken (2010).⁽¹⁾ Changes in interbank interest rates then feed through to a wider range of interest rates in different markets and at different maturities, including the interest rates that banks charge borrowers for loans and offer savers for deposits.⁽²⁾ By influencing the price of credit in this way, monetary policy affects the creation of broad money.

This description of the relationship between monetary policy and money differs from the description in many introductory textbooks, where central banks determine the quantity of broad money via a 'money multiplier' by actively varying the quantity of reserves.⁽³⁾ In that view, central banks implement monetary policy by choosing the quantity of reserves. And, because there is assumed to be a stable ratio of broad money to base money, these reserves are then 'multiplied up' to a much greater change in bank deposits as banks increase lending and deposits.

Neither step in that story represents an accurate description of the relationship between money and monetary policy in the modern economy. **Central banks do not typically choose a quantity of reserves to bring about the desired short-term interest rate.**⁽⁴⁾ **Rather, they focus on prices — setting interest rates.**⁽⁵⁾ The Bank of England controls interest rates by supplying and remunerating reserves at its chosen policy rate. The supply of both reserves and currency (which together make up base money) is determined by banks' demand for reserves both for the settlement of payments and to meet demand for currency from their customers — demand that the central bank typically accommodates.

This demand for base money is therefore more likely to be a consequence rather than a cause of banks making loans and creating broad money. This is because banks' decisions to extend credit are based on the availability of profitable lending opportunities at any given point in time. The profitability of making a loan will depend on a number of factors, as discussed earlier. One of these is the cost of funds that banks face, which is closely related to the interest rate paid on reserves, the policy rate.

In contrast, the quantity of reserves already in the system does not constrain the creation of broad money through the act of lending.⁽⁶⁾ This leg of the money multiplier is sometimes motivated by appealing to central bank reserve requirements, whereby banks are obliged to hold a minimum amount of reserves equal to a fixed proportion of their holdings of deposits. But reserve requirements are not an important aspect of monetary policy frameworks in most advanced economies today.⁽⁷⁾

A looser stance of monetary policy is likely to increase the stock of broad money by reducing loan rates and increasing the volume of loans. And a larger stock of broad money, accompanied by an increased level of spending in the economy, may cause banks and customers to demand more reserves and currency.⁽⁸⁾ So, in reality, the theory of the money multiplier operates in the reverse way to that normally described.

QE — creating broad money directly with monetary policy

The previous section discussed how monetary policy can be seen as the ultimate *limit* to money creation by commercial banks. But commercial banks could alternatively create too little money to be consistent with the economy meeting the inflation target. In normal times, the MPC can respond by lowering the policy rate to encourage more lending and hence more money creation. But, in response to the financial crisis, the MPC cut Bank Rate to 0.5% — the so-called effective lower bound.

Once short-term interest rates reach the effective lower bound, it is not possible for the central bank to provide further stimulus to the economy by lowering the rate at which reserves are remunerated.⁽⁹⁾ One possible way of providing further monetary stimulus to the economy is through a programme of asset purchases (QE). Like reductions in Bank

(1) The framework for the Bank's operations in the sterling money markets is set out in the Bank's 'Red Book', available at www.bankofengland.co.uk/markets/Documents/money/publications/redbook.pdf. Recent developments in sterling money markets are discussed by Jackson and Sim (2013).

(2) Bank of England (1999) discusses the transmission mechanism of monetary policy in more detail.

(3) Benes and Kumhof (2012) discuss the money multiplier myth in more detail.

(4) As discussed by Disyatat (2008).

(5) Bindseil (2004) provides a detailed account of how monetary policy implementation works through short-term interest rates.

(6) Carpenter and Demiralp (2012) show that changes in quantities of reserves are unrelated to changes in quantities of loans in the United States.

(7) The Bank of England currently has no formal reserve requirements, for example. (It does require banks to hold a proportion of non-interest bearing 'cash ratio deposits' with the Bank for a subset of their liabilities. But the function of these cash ratio deposits is non-operational. Their sole purpose is to provide income for the Bank.) Bernanke (2007) discusses how reserve requirements now present less of a constraint than in the past in the United States.

(8) Kydland and Prescott (1990) found that broad money aggregates led the cycle, while base money aggregates tended to lag the cycle slightly.

(9) If the central bank were to lower interest rates significantly below zero, banks could swap their bank reserves into currency, which would pay a higher interest rate (of zero, or slightly less after taking into account the costs of storing currency). Or put another way, the demand for central bank reserves would disappear, so the central bank could no longer influence the economy by changing the price of those reserves.

The information content of different types of money and monetary aggregates

One of the Bank of England's primary objectives is to ensure monetary stability by keeping inflation on track to meet the Government's 2% target. Milton Friedman (1963) famously argued that 'inflation is always and everywhere a monetary phenomenon'. So changes in the money supply may contain valuable information about spending and inflationary pressure in the economy. Since money is essential for buying goods and services, it is likely to contain **corroborative information** about the *current* level of nominal spending in the economy. It may also provide **incremental information** about *future* movements in nominal spending, and so can be a useful indicator of future inflationary pressure. Finally, the behaviour of money may help to reveal the **nature of the monetary transmission mechanism**, especially when monetary policy is operated through 'quantitative easing' (QE).

In practice, a key difficulty is assessing which measures of money are the appropriate ones to look at for each of the different purposes. The Bank currently constructs a number of monetary aggregates and publishes a range of data that allow to be created, summarised in **Table 1**. **Chart A** shows some long-run historical time series of the growth of monetary aggregates compared with that of nominal spending in the economy.⁽¹⁾ Given the various changes in the UK monetary regime over the past 150 years, it is unlikely that a single monetary indicator perfectly captures both the corroborative and incremental information in money. The UK financial sector has also undergone various structural changes that need to be taken into account when considering the underlying link between money and spending. For example, during periods when the financial sector has grown relative to the rest of the economy (such as in the early 1980s and the 2000s), broad money has tended to grow persistently faster than nominal spending.

Narrower measures of money, such as notes and coin and sight deposits (accounts that can be withdrawn immediately without penalty) are, in principle, better corroborative indicators of spending, as these are likely to be the types of money used to carry out the majority of transactions in goods and services in the economy. The sum of notes and coin and sight deposits held by the non-bank private sector is sometimes known as zero maturity money or 'MZM'.⁽²⁾

Broader measures of money might be more appropriate as incremental indicators of future spending and more revealing about the nature of the transmission mechanism. M2, for example, additionally includes household time deposits such as savings accounts.⁽³⁾ And M4 is an even broader measure, including all sight and time deposits held by non-financial companies and non-bank financial companies. The main article describes how QE works by first increasing the deposits of financial companies. As these companies rebalance their

portfolios, asset prices are likely to increase and, with a lag, lead to an increase in households' and companies' spending. So monitoring broad money has been an important part of assessing the effectiveness of QE.⁽⁴⁾

A number of econometric studies have suggested that sectoral movements in broad money may also provide valuable incremental information about spending in the economy.⁽⁵⁾ For example, non-financial companies' deposits appear to be a leading indicator of business investment in the economy. One can also try and weight different types of narrow and broad money together using some metric of how much each type of money is used in transactions — known as a Divisia index.⁽⁶⁾ In practice, the interest paid on a given type of money is typically used as a weighting metric. That is because individuals and companies are only likely to hold money which earns a low interest rate relative to other financial instruments if it compensates them by providing greater transactions services.

Identifying the appropriate measurement of money has been complicated by the continued development of the financial sector. This has both expanded the range of instruments that might serve as money and the range of financial institutions that borrow from and deposit with the traditional banking system. For example, sale and repurchase agreements (known as repos) — where a company agrees to buy a security from a bank with agreement to sell it back later — are currently included in M4 since the claim held on the bank can be thought of as a secured deposit.

In addition, some economists have argued that a range of instruments that provide collateral for various types of borrowing and lending could also be included in a broader measure of money.⁽⁷⁾ Moreover, many of the non-bank institutions that hold deposits mainly intermediate between banks themselves. The deposits of these institutions, known as 'intermediate other financial corporations' (IOFCs), are likely to reflect activities within the banking system that are not directly related to spending in the economy.⁽⁸⁾ For this reason, the Bank's headline measure of broad money is M4^{ex}, which excludes IOFC deposits.

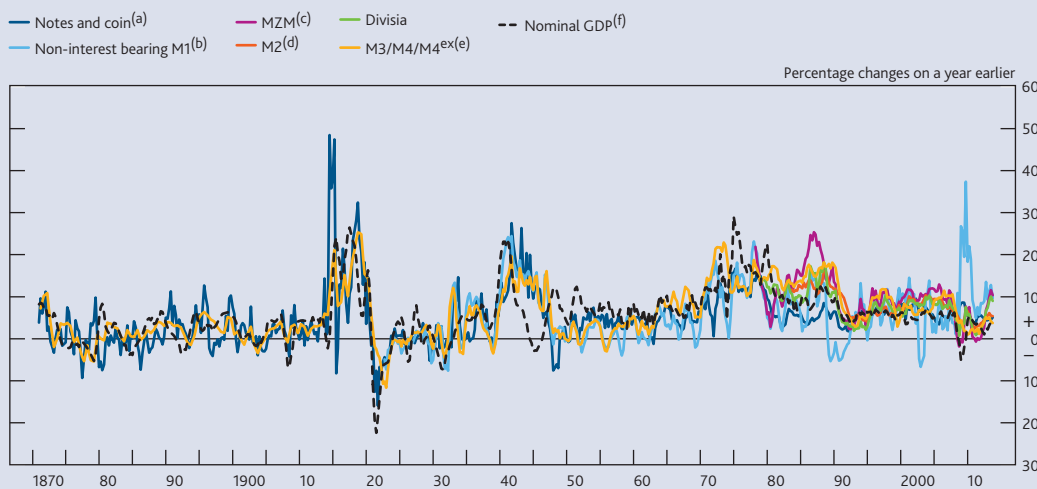
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- (1) These series involve splicing together current Bank of England data with historic data on monetary aggregates.
- (2) A narrower measure known as non-interest bearing M1 can also be constructed. This measure has become a less useful aggregate as most sight deposits now pay some form of interest. For example, during the financial crisis when interest rates fell close to zero, the growth of non-interest bearing M1 picked up markedly as the relative cost of holding a non-interest bearing deposit fell sharply compared to an interest-bearing one. Focusing on M1 would have given a misleading signal about the growth of nominal spending in the economy.
- (3) M2 contains the non-bank private sector's holdings of notes and coin plus 'retail' deposits which are deposits that pay an advertised interest rate. Those will largely be deposits held by households but will also apply to some corporate deposits.
- (4) See Bridges, Rossiter and Thomas (2011) and Butt *et al* (2012).
- (5) See, for example, Astley and Haldane (1995), Thomas (1997a, b) and Brigden and Mizen (2004).
- (6) See Hancock (2005), for example.
- (7) See, for example, Singh (2013).
- (8) See Burgess and Janssen (2007) and www.bankofengland.co.uk/statistics/Pages/iadb/notesiadb/m4adjusted.aspx for more detail.

Table 1 Popular monetary aggregates that can be constructed from available UK data^(a)

Name	Definition	Description ^(b)	Availability
Notes and coin	Notes and coin in circulation outside the Bank of England.	The narrowest measure of money and used as an indicator of cash-based transactions.	1870–present ^(c)
M0	Notes and coin plus central bank reserves.	Historically the base measure of money used in money multiplier calculations. Often used as an approximate measure of the size of the Bank of England’s balance sheet. <i>No longer published by the Bank of England but can be reconstructed.^(d)</i>	1870–present ^(c)
Non-interest bearing M1	Notes and coin plus non-interest bearing sight deposits held by the non-bank private sector.	An indicator of transactions in goods and services in the economy, less useful now since most sight deposits pay some form of interest. <i>Not published by the Bank of England but can be constructed from published components.</i>	1921–present ^(c)
MZM	Notes and coin plus all sight deposits held by the non-bank private sector.	An indicator of transactions in goods and services in the economy. <i>Not published by the Bank of England but can be constructed from published components. The Bank also produces a measure based on an ECB definition of M1.</i>	1977–present
M2 or retail M4	Notes and coin plus all retail deposits (including retail time deposits) held by the non-bank private sector.	A broader measure of money than MZM encompassing all retail deposits. The key additions are household time deposits and some corporate retail time deposits. <i>Published by the Bank of England. The Bank also produces a measure based on an ECB definition of M2.</i>	1982–present
M3	Notes and coin plus all sight and time deposits held with banks (excluding building societies) by the non-bank private sector.	Up until 1987 the headline broad monetary aggregate constructed by the Bank of England. <i>The Bank also produces a measure based on an ECB definition of M3.</i>	1870–1990 ^(c)
M4	Notes and coin, deposits, certificates of deposit, repos and securities with a maturity of less than five years held by the non-bank private sector.	Up until 2007 the headline broad monetary aggregate constructed by the Bank of England.	1963–present
M4 ^{ex}	M4 excluding the deposits of IOFCs.	Since 2007 the headline broad monetary aggregate constructed by the Bank of England.	1997–present
Divisia	A weighted sum of different types of money.	Aims to weight the component assets of broad money according to the transactions services they provide. ^(e)	1977–present

(a) All definitions refer to sterling instruments only. Some of the definitions in this table were changed at various points in time. For example the original M3 aggregate included public sector deposits and the non-bank private sector’s holdings of deposits in foreign currency. A more comprehensive history of the development of UK monetary aggregates can be found at www.bankofengland.co.uk/statistics/Documents/ms/articles/art2jul03.pdf.
 (b) Published by the Bank of England unless otherwise stated.
 (c) This series uses the data constructed by Capie and Webber (1985).
 (d) Data on M0 were discontinued following reforms to the Bank of England’s money market operations in 2006. See www.bankofengland.co.uk/statistics/Documents/ms/articles/artjun06.pdf for more details.
 (e) The Divisia indices for other financial corporations and for the non-bank private sector were discontinued in 2013. See www.bankofengland.co.uk/statistics/Documents/ms/articles/art1aug13.pdf for more details.

Chart A Different monetary aggregates and nominal spending



Sources: Bank of England, Capie and Webber (1985), Mitchell (1988), ONS, Sefton and Weale (1995), Solomou and Weale (1991) and Bank calculations. All series seasonally adjusted and break-adjusted where possible. Historical data seasonally adjusted using X12.

(a) 1969 Q2 to 2013 Q4 — notes and coin in circulation. 1870 Q1 to 1969 Q2 — M0 from Capie and Webber (1985).
 (b) 1977 Q1 to 2013 Q4 — notes and coin held by the non-bank and building society private sector plus non-interest bearing deposits. Prior to 2008 Q1, excludes deposits with building societies. 1963 Q1 to 1977 Q1 — historical M1 data from *Bank of England Quarterly Bulletins*. 1921 Q4 to 1963 Q1 — Capie and Webber (1985).
 (c) Notes and coin held by the non-bank and building society private sector plus total sight deposits. Prior to 1998 Q4 excludes deposits with building societies.
 (d) Notes and coin and retail deposits held by the non-bank and building society private sector.
 (e) 1997 Q4 to 2013 Q4 — M4 excluding intermediate OFCs. 1963 Q1 to 1997 Q4 — M4. 1870 Q2 to 1963 Q1 — M3 from Capie and Webber (1985).
 (f) Composite estimate of nominal GDP at market prices. See appendix of Hills, Thomas and Dimsdale (2010) for details.

Rate, asset purchases are a way in which the MPC can loosen the stance of monetary policy in order to stimulate economic activity and meet its inflation target. But the role of money in the two policies is not the same.

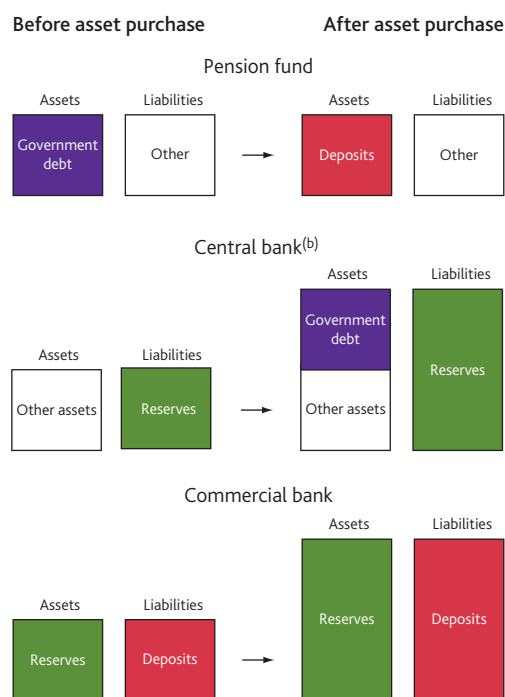
QE involves a shift in the focus of monetary policy to the quantity of money: the central bank purchases a quantity of assets, financed by the creation of broad money and a corresponding increase in the amount of central bank reserves. The sellers of the assets will be left holding the newly created deposits in place of government bonds. They will be likely to be holding more money than they would like, relative to other assets that they wish to hold. They will therefore want to rebalance their portfolios, for example by using the new deposits to buy higher-yielding assets such as bonds and shares issued by companies — leading to the ‘hot potato’ effect discussed earlier. This will raise the value of those assets and lower the cost to companies of raising funds in these markets. That, in turn, should lead to higher spending in the economy.⁽¹⁾ The way in which QE works therefore differs from two common misconceptions about central bank asset purchases: that QE involves giving banks ‘free money’; and that the key aim of QE is to increase bank lending by providing more reserves to the banking system, as might be described by the money multiplier theory. This section explains the relationship between money and QE and dispels these misconceptions.

The link between QE and quantities of money

QE has a direct effect on the quantities of both base and broad money because of the way in which the Bank carries out its asset purchases. The policy aims to buy assets, government bonds, mainly from non-bank financial companies, such as pension funds or insurance companies. Consider, for example, the purchase of £1 billion of government bonds from a pension fund. One way in which the Bank could carry out the purchase would be to print £1 billion of banknotes and swap these directly with the pension fund. But transacting in such large quantities of banknotes is impractical. These sorts of transactions are therefore carried out using electronic forms of money.

As the pension fund does not hold a reserves account with the Bank of England, the commercial bank with whom they hold a bank account is used as an intermediary. The pension fund’s bank credits the pension fund’s account with £1 billion of deposits in exchange for the government bonds. This is shown in the first panel of **Figure 3**. The Bank of England finances its purchase by crediting reserves to the pension fund’s bank — it gives the commercial bank an IOU (second row). The commercial bank’s balance sheet expands: new deposit liabilities are matched with an asset in the form of new reserves (third row).

Figure 3 Impact of QE on balance sheets^(a)



(a) Balance sheets are highly stylised for ease of exposition: quantities of assets and liabilities shown do not correspond to the quantities actually held by those sectors. The figure only shows assets and liabilities relevant to the transaction.

(b) Government debt is actually purchased by the Bank of England’s Asset Purchase Facility using a loan from the Bank of England, so does not actually appear directly on the Bank’s official consolidated balance sheet.

Two misconceptions about how QE works

Why the extra reserves are not ‘free money’ for banks

While the central bank’s asset purchases involve — and affect — commercial banks’ balance sheets, the primary role of those banks is as an *intermediary* to facilitate the transaction between the central bank and the pension fund. The additional reserves shown in **Figure 3** are simply a by-product of this transaction. It is sometimes argued that, because they are assets held by commercial banks that earn interest, these reserves represent ‘free money’ for banks. While banks do earn interest on the newly created reserves, QE also creates an accompanying liability for the bank in the form of the pension fund’s deposit, which the bank will itself typically have to pay interest on. In other words, QE leaves banks with both a new IOU *from* the central bank but also a new, equally sized IOU *to* consumers (in this case, the pension fund), and the interest rates on both of these depend on Bank Rate.

Why the extra reserves are not multiplied up into new loans and broad money

As discussed earlier, the transmission mechanism of QE relies on the effects of the newly created broad — rather than base — money. The start of that transmission is the creation of

(1) The ways in which QE affects the economy are covered in more detail in Benford *et al* (2009), Joyce, Tong and Woods (2011) and Bowdler and Radia (2012). The role of money more specifically is described in Bridges, Rossiter and Thomas (2011), Bridges and Thomas (2012) and Butt *et al* (2012).

bank deposits on the asset holder's balance sheet in the place of government debt (Figure 3, first row). Importantly, the reserves created in the banking sector (Figure 3, third row) do not play a central role. This is because, as explained earlier, banks cannot directly lend out reserves. Reserves are an IOU from the central bank to commercial banks. Those banks can use them to make payments to each other, but they cannot 'lend' them on to consumers in the economy, who do not hold reserves accounts. When banks make additional loans they are matched by extra deposits — the amount of reserves does not change.

Moreover, the new reserves are not mechanically multiplied up into new loans and new deposits as predicted by the money multiplier theory. QE boosts broad money without directly leading to, or requiring, an increase in lending. While the first leg of the money multiplier theory does hold during QE — the monetary stance mechanically determines the quantity of reserves — the newly created reserves do not, by themselves, meaningfully change the incentives for the banks to create new broad money by lending. It is possible that QE might indirectly affect the incentives facing banks to make new loans, for example by reducing their funding costs, or by increasing the quantity of credit by boosting activity.⁽¹⁾ But equally, QE could lead to companies repaying bank credit, if they were to issue more bonds or equity and use those funds

to repay bank loans. On balance, it is therefore possible for QE to increase or to reduce the amount of bank lending in the economy. However these channels were not expected to be key parts of its transmission: instead, QE works by circumventing the banking sector, aiming to increase private sector spending directly.⁽²⁾

Conclusion

This article has discussed how money is created in the modern economy. Most of the money in circulation is created, not by the printing presses of the Bank of England, but by the commercial banks themselves: banks create money whenever they lend to someone in the economy or buy an asset from consumers. And in contrast to descriptions found in some textbooks, the Bank of England does not directly control the quantity of either base or broad money. The Bank of England is nevertheless still able to influence the amount of money in the economy. It does so in normal times by setting monetary policy — through the interest rate that it pays on reserves held by commercial banks with the Bank of England. More recently, though, with Bank Rate constrained by the effective lower bound, the Bank of England's asset purchase programme has sought to raise the quantity of broad money in circulation. This in turn affects the prices and quantities of a range of assets in the economy, including money.

(1) A similar mechanism whereby QE could increase bank lending by enabling banks to attract more stable funding is discussed in Miles (2012).

(2) These channels, along with the effect of QE on bank lending more broadly, are discussed in detail in a box in Butt *et al* (2012).

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Money creation in the modern economy

By Michael McLeay, Amar Radia and Ryland Thomas of the Bank's Monetary Analysis Directorate.⁽¹⁾

- This article explains how the majority of money in the modern economy is created by commercial banks making loans.
- Money creation in practice differs from some popular misconceptions — banks do not act simply as intermediaries, lending out deposits that savers place with them, and nor do they 'multiply up' central bank money to create new loans and deposits.
- The amount of money created in the economy ultimately depends on the monetary policy of the central bank. In normal times, this is carried out by setting interest rates. The central bank can also affect the amount of money directly through purchasing assets or 'quantitative easing'.

Overview

In the modern economy, most money takes the form of bank deposits. But how those bank deposits are created is often misunderstood: the principal way is through commercial banks making loans. **Whenever a bank makes a loan, it simultaneously creates a matching deposit in the borrower's bank account, thereby creating new money.**

The reality of how money is created today differs from the description found in some economics textbooks:

- Rather than banks receiving deposits when households save and then lending them out, bank lending creates deposits.
- In normal times, the central bank does not fix the amount of money in circulation, nor is central bank money 'multiplied up' into more loans and deposits.

Although commercial banks create money through lending, they cannot do so freely without limit. Banks are limited in how much they can lend if they are to remain profitable in a competitive banking system. Prudential regulation also acts as a constraint on banks' activities in order to maintain the resilience of the financial system. And the households and companies who receive the money created by new lending may take actions that affect the stock of money — they could quickly 'destroy' money by using it to repay their existing debt, for instance.

Monetary policy acts as the ultimate limit on money creation. The Bank of England aims to make sure the amount of money creation in the economy is consistent with

low and stable inflation. In normal times, the Bank of England implements monetary policy by setting the interest rate on central bank reserves. This then influences a range of interest rates in the economy, including those on bank loans.

In exceptional circumstances, when interest rates are at their effective lower bound, money creation and spending in the economy may still be too low to be consistent with the central bank's monetary policy objectives. One possible response is to undertake a series of asset purchases, or 'quantitative easing' (QE). QE is intended to boost the amount of money in the economy directly by purchasing assets, mainly from non-bank financial companies.

QE initially increases the amount of bank deposits those companies hold (in place of the assets they sell). Those companies will then wish to rebalance their portfolios of assets by buying higher-yielding assets, raising the price of those assets and stimulating spending in the economy.

As a by-product of QE, new central bank reserves are created. But these are not an important part of the transmission mechanism. This article explains how, just as in normal times, these reserves cannot be multiplied into more loans and deposits and how these reserves do not represent 'free money' for banks.

[Click here for a short video filmed in the Bank's gold vaults that discusses some of the key topics from this article.](#)

(1) The authors would like to thank Lewis Kirkham for his help in producing this article.

Introduction

'Money in the modern economy: an introduction', a companion piece to this article, provides an overview of what is meant by money and the different types of money that exist in a modern economy, briefly touching upon how each type of money is created. This article explores money creation in the modern economy in more detail.

The article begins by outlining two common misconceptions about money creation, and explaining how, in the modern economy, money is largely created by commercial banks making loans.⁽¹⁾ The article then discusses the limits to the banking system's ability to create money and the important role for central bank policies in ensuring that credit and money growth are consistent with monetary and financial stability in the economy. The final section discusses the role of money in the monetary transmission mechanism during periods of quantitative easing (QE), and dispels some myths surrounding money creation and QE. A short video explains some of the key topics covered in this article.⁽²⁾

Two misconceptions about money creation

The vast majority of money held by the public takes the form of bank deposits. But where the stock of bank deposits comes from is often misunderstood. **One common misconception is that banks act simply as intermediaries, lending out the deposits that savers place with them.** In this view deposits are typically 'created' by the saving decisions of households, and banks then 'lend out' those existing deposits to borrowers, for example to companies looking to finance investment or individuals wanting to purchase houses.

In fact, when households choose to save more money in bank accounts, those deposits come simply at the expense of deposits that would have otherwise gone to companies in payment for goods and services. Saving does not by itself increase the deposits or 'funds available' for banks to lend. Indeed, viewing banks simply as intermediaries ignores the fact that, in reality in the modern economy, commercial banks are the creators of deposit money. This article explains how, rather than banks lending out deposits that are placed with them, the act of lending creates deposits — the reverse of the sequence typically described in textbooks.⁽³⁾

Another common misconception is that the central bank determines the quantity of loans and deposits in the economy by controlling the quantity of central bank money — the so-called 'money multiplier' approach. In that view, central banks implement monetary policy by choosing a quantity of reserves. And, because there is assumed to be a constant ratio of broad money to base money, these reserves are then 'multiplied up' to a much greater change in bank

loans and deposits. For the theory to hold, the amount of reserves must be a binding constraint on lending, and the central bank must directly determine the amount of reserves. While the money multiplier theory can be a useful way of introducing money and banking in economic textbooks, it is not an accurate description of how money is created in reality. Rather than controlling the quantity of reserves, central banks today typically implement monetary policy by setting the price of reserves — that is, interest rates.

In reality, neither are reserves a binding constraint on lending, nor does the central bank fix the amount of reserves that are available. As with the relationship between deposits and loans, the relationship between reserves and loans typically operates in the reverse way to that described in some economics textbooks. Banks first decide how much to lend depending on the profitable lending opportunities available to them — which will, crucially, depend on the interest rate set by the Bank of England. It is these lending decisions that determine how many bank deposits are created by the banking system. The amount of bank deposits in turn influences how much central bank money banks want to hold in reserve (to meet withdrawals by the public, make payments to other banks, or meet regulatory liquidity requirements), which is then, in normal times, supplied on demand by the Bank of England. The rest of this article discusses these practices in more detail.

Money creation in reality

Lending creates deposits — broad money determination at the aggregate level

As explained in 'Money in the modern economy: an introduction', broad money is a measure of the total amount of money held by households and companies in the economy. Broad money is made up of bank deposits — which are essentially IOUs from commercial banks to households and companies — and currency — mostly IOUs from the central bank.⁽⁴⁾⁽⁵⁾ Of the two types of broad money, bank deposits make up the vast majority — 97% of the amount currently in circulation.⁽⁶⁾ **And in the modern economy, those bank deposits are mostly created by commercial banks themselves.**

(1) Throughout this article, 'banks' and 'commercial banks' are used to refer to banks and building societies together.

(2) See www.youtube.com/watch?v=CvRAqR2pAgw.

(3) There is a long literature that does recognise the 'endogenous' nature of money creation in practice. See, for example, Moore (1988), Howells (1995) and Palley (1996).

(4) The definition of broad money used by the Bank of England, $M4^{EX}$, also includes a wider range of bank liabilities than regular deposits; see Burgess and Janssen (2007) for more details. For simplicity, this article describes all of these liabilities as deposits. A box later in this article provides details about a range of popular monetary aggregates in the United Kingdom.

(5) Around 6% of the currency in circulation is made up of coins, which are produced by The Royal Mint. Of the banknotes that circulate in the UK economy, some are issued by some Scottish and Northern Irish commercial banks, although these are fully matched by Bank of England money held at the Bank.

(6) As of December 2013.

Commercial banks create money, in the form of bank deposits, by making new loans. When a bank makes a loan, for example to someone taking out a mortgage to buy a house, it does not typically do so by giving them thousands of pounds worth of banknotes. Instead, it credits their bank account with a bank deposit of the size of the mortgage. **At that moment, new money is created.** For this reason, some economists have referred to bank deposits as ‘fountain pen money’, created at the stroke of bankers’ pens when they approve loans.⁽¹⁾

This process is illustrated in **Figure 1**, which shows how new lending affects the balance sheets of different sectors of the economy (similar balance sheet diagrams are introduced in ‘Money in the modern economy: an introduction’). As shown in the third row of **Figure 1**, the new deposits increase the assets of the consumer (here taken to represent households and companies) — the extra red bars — and the new loan increases their liabilities — the extra white bars. New broad money has been created. Similarly, both sides of the commercial banking sector’s balance sheet increase as new money and loans are created. It is important to note that although the simplified diagram of **Figure 1** shows the amount of new money created as being identical to the amount of new lending, in practice there will be several factors that may subsequently cause the amount of deposits to be different from the amount of lending. These are discussed in detail in the next section.

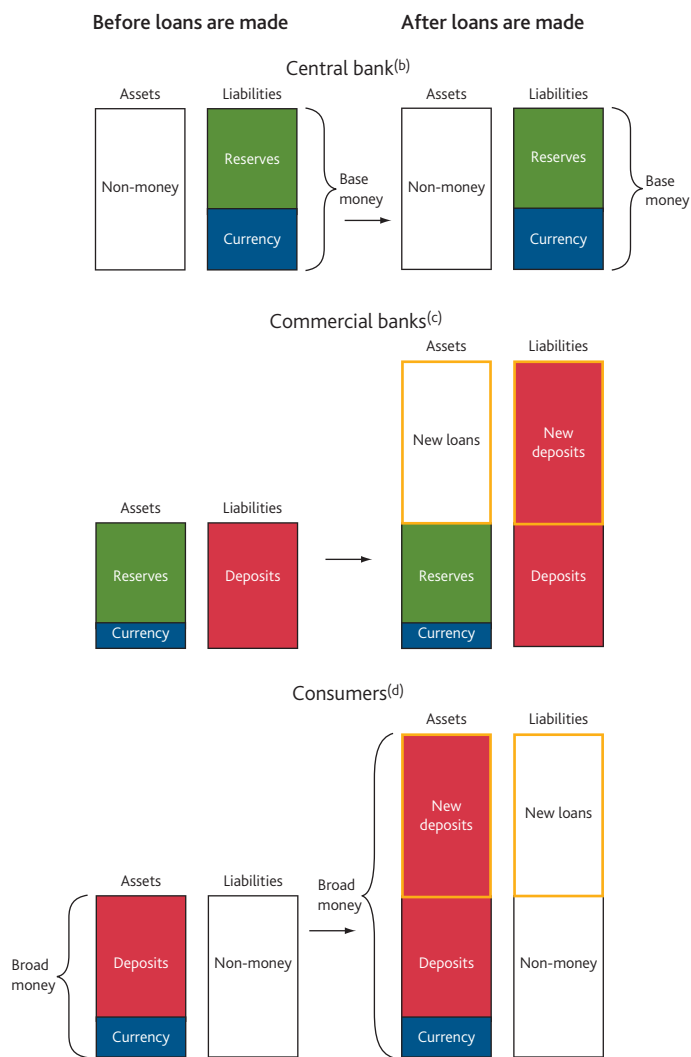
While new broad money has been created on the consumer’s balance sheet, the first row of **Figure 1** shows that this is without — in the first instance, at least — any change in the amount of central bank money or ‘base money’. As discussed earlier, the higher stock of deposits may mean that banks want, or are required, to hold more central bank money in order to meet withdrawals by the public or make payments to other banks. And reserves are, in normal times, supplied ‘on demand’ by the Bank of England to commercial banks in exchange for other assets on their balance sheets. In no way does the aggregate *quantity* of reserves directly constrain the amount of bank lending or deposit creation.

This description of money creation contrasts with the notion that banks can only lend out pre-existing money, outlined in the previous section. Bank deposits are simply a record of how much the bank itself owes its customers. So they are a *liability* of the bank, not an *asset* that could be lent out. A related misconception is that banks can lend out their reserves. Reserves can only be lent *between banks*, since consumers do not have access to reserves accounts at the Bank of England.⁽²⁾

Other ways of creating and destroying deposits

Just as taking out a new loan creates money, the repayment of bank loans destroys money.⁽³⁾ For example, suppose a consumer has spent money in the supermarket throughout the month by using a credit card. Each purchase made using the

Figure 1 Money creation by the aggregate banking sector making additional loans^(a)



- (a) Balance sheets are highly stylised for ease of exposition: the quantities of each type of money shown do not correspond to the quantities actually held on each sector’s balance sheet.
- (b) Central bank balance sheet only shows base money liabilities and the corresponding assets. In practice the central bank holds other non-money liabilities. Its non-monetary assets are mostly made up of government debt. Although that government debt is actually held by the Bank of England Asset Purchase Facility, so does not appear directly on the balance sheet.
- (c) Commercial banks’ balance sheets only show money assets and liabilities before any loans are made.
- (d) Consumers represent the private sector of households and companies. Balance sheet only shows broad money assets and corresponding liabilities — real assets such as the house being transacted are not shown. Consumers’ non-money liabilities include existing secured and unsecured loans.

credit card will have increased the outstanding loans on the consumer’s balance sheet and the deposits on the supermarket’s balance sheet (in a similar way to that shown in **Figure 1**). If the consumer were then to pay their credit card

- (1) Fountain pen money is discussed in Tobin (1963), who mentions it in the context of making an argument that banks cannot create unlimited amounts of money in practice.
- (2) Part of the confusion may stem from some economists’ use of the term ‘reserves’ when referring to ‘excess reserves’ — balances held above those required by regulatory reserve requirements. In this context, ‘lending out reserves’ could be a shorthand way of describing the process of increasing lending and deposits until the bank reaches its maximum ratio. As there are no reserve requirements in the United Kingdom the process is less relevant for UK banks.
- (3) The fall in bank lending in the United Kingdom since 2008 is an important reason why the growth of money in the economy has been so much lower than in the years leading up to the crisis, as discussed in Bridges, Rossiter and Thomas (2011) and Butt *et al* (2012).

bill in full at the end of the month, its bank would reduce the amount of deposits in the consumer's account by the value of the credit card bill, thus destroying all of the newly created money.

Banks making loans and consumers repaying them are the most significant ways in which bank deposits are created and destroyed in the modern economy. But they are far from the only ways. Deposit creation or destruction will also occur any time the banking sector (including the central bank) buys or sells existing assets from or to consumers, or, more often, from companies or the government.

Banks buying and selling government bonds is one particularly important way in which the purchase or sale of existing assets by banks creates and destroys money. Banks often buy and hold government bonds as part of their portfolio of liquid assets that can be sold on quickly for central bank money if, for example, depositors want to withdraw currency in large amounts.⁽¹⁾ When banks purchase government bonds from the non-bank private sector they credit the sellers with bank deposits.⁽²⁾ And, as discussed later in this article, central bank asset purchases, known as quantitative easing (QE), have similar implications for money creation.

Money can also be destroyed through the issuance of long-term debt and equity instruments by banks. In addition to deposits, banks hold other liabilities on their balance sheets. Banks manage their liabilities to ensure that they have at least some capital and longer-term debt liabilities to mitigate certain risks and meet regulatory requirements. Because these 'non-deposit' liabilities represent longer-term investments in the banking system by households and companies, they cannot be exchanged for currency as easily as bank deposits, and therefore increase the resilience of the bank. When banks issue these longer-term debt and equity instruments to non-bank financial companies, those companies pay for them with bank deposits. That reduces the amount of deposit, or money, liabilities on the banking sector's balance sheet and increases their non-deposit liabilities.⁽³⁾

Buying and selling of existing assets and issuing longer-term liabilities may lead to a gap between lending and deposits in a closed economy. Additionally, in an open economy such as the United Kingdom, deposits can pass from domestic residents to overseas residents, or sterling deposits could be converted into foreign currency deposits. These transactions do not destroy money *per se*, but overseas residents' deposits and foreign currency deposits are not always counted as part of a country's money supply.

Limits to broad money creation

Although commercial banks create money through their lending behaviour, they cannot in practice do so without limit. In particular, the price of loans — that is, the interest rate (plus

any fees) charged by banks — determines the amount that households and companies will want to borrow. A number of factors influence the price of new lending, not least the monetary policy of the Bank of England, which affects the level of various interest rates in the economy.

The limits to money creation by the banking system were discussed in a paper by Nobel Prize winning economist James Tobin and this topic has recently been the subject of debate among a number of economic commentators and bloggers.⁽⁴⁾ In the modern economy there are three main sets of constraints that restrict the amount of money that banks can create.

(i) **Banks themselves face limits on how much they can lend.** In particular:

- Market forces constrain lending because individual banks have to be able to lend profitably in a competitive market.
- Lending is also constrained because banks have to take steps to mitigate the risks associated with making additional loans.
- Regulatory policy acts as a constraint on banks' activities in order to mitigate a build-up of risks that could pose a threat to the stability of the financial system.

(ii) **Money creation is also constrained by the behaviour of the money holders — households and businesses.** Households and companies who receive the newly created money might respond by undertaking transactions that immediately destroy it, for example by repaying outstanding loans.

(iii) **The ultimate constraint on money creation is monetary policy.** By influencing the level of interest rates in the economy, the Bank of England's monetary policy affects how much households and companies want to borrow. This occurs both directly, through influencing the loan rates charged by banks, but also indirectly through the overall effect of monetary policy on economic activity in

(1) It is for this reason that holdings of some government bonds are counted towards meeting prudential liquidity requirements, as described in more detail by Farag, Harland and Nixon (2013).

(2) In a balance sheet diagram such as Figure 1, a purchase of government bonds from consumers by banks would be represented by a change in the composition of consumers' assets from government bonds to deposits and an increase in both deposits and government bonds on the commercial banks' balance sheet.

(3) Commercial banks' purchases of government bonds and their issuance of long-term debt and equity have both been important influences on broad money growth during the financial crisis as discussed in Bridges, Rossiter and Thomas (2011) and Butt *et al* (2012).

(4) Tobin (1963) argued that banks do not possess a 'widow's cruse', referring to a biblical story (earlier referenced in economics by John Maynard Keynes) in which a widow is able to miraculously refill a cruse (a pot or jar) of oil during a famine. Tobin was arguing that there were limits to how many loans could be automatically matched by deposits.

the economy. As a result, the Bank of England is able to ensure that money growth is consistent with its objective of low and stable inflation.

The remainder of this section explains how each of these mechanisms work in practice.

(i) Limits on how much banks can lend

Market forces facing individual banks

Figure 1 showed how, for the *aggregate* banking sector, loans are initially created with matching deposits. But that does not mean that any given *individual* bank can freely lend and create money without limit. That is because banks have to be able to lend profitably in a competitive market, and ensure that they adequately manage the risks associated with making loans.

Banks receive interest payments on their assets, such as loans, but they also generally have to pay interest on their liabilities, such as savings accounts. A bank's business model relies on receiving a higher interest rate on the loans (or other assets) than the rate it pays out on its deposits (or other liabilities). Interest rates on both banks' assets and liabilities depend on the policy rate set by the Bank of England, which acts as the ultimate constraint on money creation. The commercial bank uses the difference, or spread, between the expected return on their assets and liabilities to cover its operating costs and to make profits.⁽¹⁾ In order to make extra loans, an individual bank will typically have to lower its loan rates relative to its competitors to induce households and companies to borrow more. And once it has made the loan it may well 'lose' the deposits it has created to those competing banks. Both of these factors affect the profitability of making a loan for an individual bank and influence how much borrowing takes place.

For example, suppose an individual bank lowers the rate it charges on its loans, and that attracts a household to take out a mortgage to buy a house. The moment the mortgage loan is made, the household's account is credited with new deposits. And once they purchase the house, they pass their new deposits on to the house seller. This situation is shown in the first row of Figure 2. The buyer is left with a new asset in the form of a house and a new liability in the form of a new loan. The seller is left with money in the form of bank deposits instead of a house. It is more likely than not that the seller's account will be with a different bank to the buyer's. So when the transaction takes place, the new deposits will be transferred to the seller's bank, as shown in the second row of Figure 2. The buyer's bank would then have fewer deposits than assets. In the first instance, the buyer's bank settles with the seller's bank by transferring reserves. But that would leave the buyer's bank with fewer reserves and more loans relative to its deposits than before. This is likely to be problematic for the bank since it would increase the risk that it would not be able to meet all of its likely outflows. And, in practice, banks

make many such loans every day. So if a given bank financed all of its new loans in this way, it would soon run out of reserves.

Banks therefore try to attract or retain additional liabilities to accompany their new loans. In practice other banks would also be making new loans and creating new deposits, so one way they can do this is to try and attract some of those newly created deposits. In a competitive banking sector, that may involve increasing the rate they offer to households on their savings accounts. By attracting new deposits, the bank can increase its lending without running down its reserves, as shown in the third row of Figure 2. Alternatively, a bank can borrow from other banks or attract other forms of liabilities, at least temporarily. But whether through deposits or other liabilities, **the bank would need to make sure it was attracting and retaining some kind of funds in order to keep expanding lending.** And the cost of that needs to be measured against the interest the bank expects to earn on the loans it is making, which in turn depends on the level of Bank Rate set by the Bank of England. For example, if a bank continued to attract new borrowers and increase lending by reducing mortgage rates, and sought to attract new deposits by increasing the rates it was paying on its customers' deposits, it might soon find it unprofitable to keep expanding its lending. Competition for loans and deposits, and the desire to make a profit, therefore limit money creation by banks.

Managing the risks associated with making loans

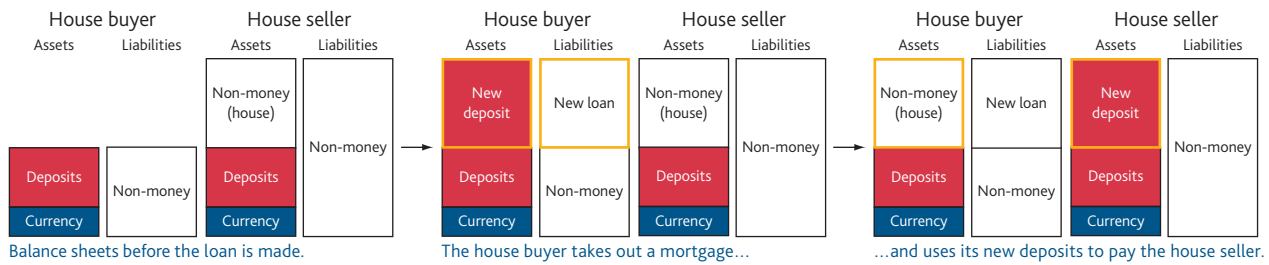
Banks also need to manage the risks associated with making new loans. One way in which they do this is by making sure that they attract relatively *stable* deposits to match their new loans, that is, deposits that are unlikely or unable to be withdrawn in large amounts. This can act as an additional limit to how much banks can lend. For example, if all of the deposits that a bank held were in the form of instant access accounts, such as current accounts, then the bank might run the risk of lots of these deposits being withdrawn in a short period of time. Because banks tend to lend for periods of many months or years, the bank may not be able to repay all of those deposits — it would face a great deal of **liquidity risk**. In order to reduce liquidity risk, banks try to make sure that some of their deposits are fixed for a certain period of time, or term.⁽²⁾ Consumers are likely to require compensation for the inconvenience of holding longer-term deposits, however, so these are likely to be more costly for banks, limiting the amount of lending banks wish to do. And as discussed earlier, if banks guard against liquidity risk by issuing long-term liabilities, this may destroy money directly when companies pay for them using deposits.

(1) See Button, Pezzini and Rossiter (2010) for an explanation of how banks price new loans.

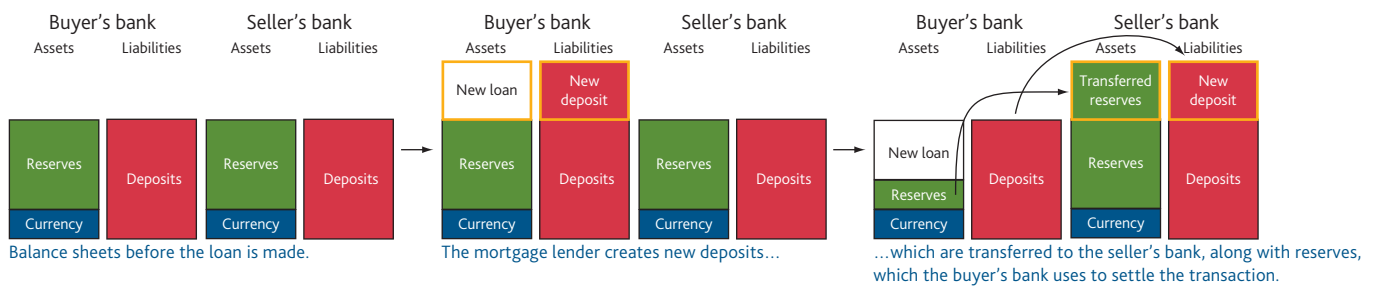
(2) Banks also guard against liquidity risk by holding liquid assets (including reserves and currency), which either can be used directly to cover outflows, or if not can quickly and cheaply be converted into assets that can. Although if banks purchase liquid assets such as government bonds from non-banks, this could create further deposits.

Figure 2 Money creation for an individual bank making an additional loan^(a)

Changes to the balance sheets of the house buyer and seller

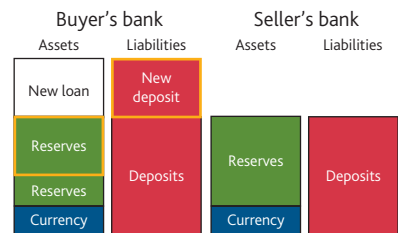


Changes to the balance sheets of the house buyer and seller's banks



But settling all transactions in this way would be unsustainable:

- The buyer's bank would have fewer reserves to meet its possible outflows, for example from deposit withdrawals.
- And if it made many new loans it would eventually run out of reserves.



So the buyer's bank will in practice seek to attract or retain new deposits (and reserves) — in the example shown here, from the seller's bank — to accompany their new loans.

(a) Balance sheets are highly stylised for ease of exposition: the quantities of each type of money shown do not correspond to the quantities actually held on each sector's balance sheet.

Individual banks' lending is also limited by considerations of **credit risk**. This is the risk to the bank of lending to borrowers who turn out to be unable to repay their loans. In part, banks can guard against credit risk by having sufficient capital to absorb any unexpected losses on their loans. But since loans will always involve some risk to banks of incurring losses, the cost of these losses will be taken into account when pricing loans. When a bank makes a loan, the interest rate it charges will typically include compensation for the average level of credit losses the bank expects to suffer. The size of this component of the interest rate will be larger when banks estimate that they will suffer higher losses, for example when lending to mortgagors with a high loan to value ratio. As banks expand lending, their average expected loss per loan is likely to increase, making those loans less profitable. This further limits the amount of lending banks can profitably do, and the money they can therefore create.

Market forces do not always lead individual banks to sufficiently protect themselves against liquidity and credit risks. Because of this, prudential regulation aims to ensure that banks do not take excessive risks when making new loans, including via requirements for banks' capital and liquidity positions. These requirements can therefore act as an additional brake on how much money commercial banks create by lending. The prudential regulatory framework, along with more detail on capital and liquidity, is described in Farag, Harland and Nixon (2013).

So far this section has considered the case of an individual bank making additional loans by offering competitive interest rates — both on its loans and deposits. But if *all* banks simultaneously decide to try to do more lending, money growth may not be limited in quite the same way. Although an individual bank may lose deposits to other banks, it would itself be likely to gain some deposits as a result of the other banks making loans.

There are a number of reasons why many banks may choose to increase their lending markedly at the same time. For example, the profitability of lending at given interest rates could increase because of a general improvement in economic conditions. Alternatively, banks may decide to lend more if they perceive the risks associated with making loans to households and companies to have fallen. This sort of development is sometimes argued to be one of the reasons why bank lending expanded so much in the lead up to the financial crisis.⁽¹⁾ But if that perception of a less risky environment were unwarranted, the result could be a more fragile financial system.⁽²⁾ One of the responses to the crisis in the United Kingdom has been the creation of a macroprudential authority, the Financial Policy Committee, to identify, monitor and take action to reduce or remove risks which threaten the resilience of the financial system as a whole.⁽³⁾

(ii) Constraints arising from the response of households and companies

In addition to the range of constraints facing banks that act to limit money creation, the behaviour of households and companies *in response* to money creation by the banking sector can also be important, as argued by Tobin. The behaviour of the non-bank private sector influences the ultimate impact that credit creation by the banking sector has on the stock of money because more (or less) money may be created than they wish to hold relative to other assets (such as property or shares). As the households and companies who take out loans do so because they want to spend more, they will quickly pass that money on to others as they do so. How *those* households and companies then respond will determine the stock of money in the economy, and potentially have implications for spending and inflation.

There are two main possibilities for what could happen to newly created deposits. First, as suggested by Tobin, the money may quickly be destroyed if the households or companies receiving the money after the loan is spent wish to use it to repay their own outstanding bank loans. This is sometimes referred to as the 'reflux theory'.⁽⁴⁾ For example, a first-time house buyer may take out a mortgage to purchase a house from an elderly person who, in turn, repays their existing mortgage and moves in with their family. As discussed earlier, repaying bank loans destroys money just as making loans creates it. So, in this case, the balance sheet of consumers in the economy would be returned to the position it was in before the loan was made.

The second possible outcome is that the extra money creation by banks can lead to more spending in the economy. For newly created money to be destroyed, it needs to pass to households and companies with existing loans who want to repay them. But this will not always be the case, since asset and debt holdings tend to vary considerably across individuals

in the economy.⁽⁵⁾ Instead, the money may initially pass to households or companies with positive holdings of financial assets: the elderly person may have already paid off their mortgage, or a company receiving money as a payment may already have sufficient liquid assets to cover possible outgoings. They may then be left holding more money than they desire, and attempt to reduce their 'excess' money holdings by increasing their spending on goods and services. (In the case of a company it may instead buy other, higher-yielding, assets.)

These two scenarios for what happens to newly created money — being quickly destroyed or being passed on via spending — have very different implications for economic activity. In the latter, the money may continue to be passed between different households and companies each of whom may, in turn, increase their spending. This process — sometimes referred to as the 'hot potato' effect — can lead, other things equal, to increased inflationary pressure on the economy.⁽⁶⁾ In contrast, if the money is quickly destroyed as in the former scenario, there need be no further effects on the economy.

This section has so far discussed how the actions of banks, households and companies can affect the amount of money in the economy, and therefore inflationary pressure. But the ultimate determinant of monetary conditions in the economy is the monetary policy of the central bank.

(iii) Monetary policy — the ultimate constraint on money creation

One of the Bank of England's primary objectives is to ensure monetary stability by keeping consumer price inflation on track to meet the 2% target set by the Government. And, as discussed in the box on pages 22–23, over some periods of time, various measures of money have grown at a similar rate to nominal spending, which determines inflationary pressure in the economy in the medium term. So setting monetary policy appropriately to meet the inflation target should ultimately ensure a stable rate of credit and money creation consistent with meeting that target. This section explains the relationship between monetary policy and different types of money.

In normal times, the Monetary Policy Committee (MPC), like most of its equivalents in other countries, implements monetary policy by setting short-term interest rates, specifically by setting the interest rate paid on central bank reserves held by commercial banks. It is able to do so because

(1) See, for example, Haldane (2009).

(2) Tucker (2009) discusses the possibility of such 'risk illusion' in the financial system.

(3) Tucker, Hall and Pattani (2013) describe the new powers for macroprudential policymaking in the United Kingdom in the wake of the recent financial crisis.

(4) See Kaldor and Trevithick (1981).

(5) See Kamath *et al* (2011).

(6) This mechanism is explained in more detail in papers including Laidler (1984), Congdon (1992, 2005), Howells (1995), Laidler and Robson (1995), Bridges, Rossiter and Thomas (2011) and Bridges and Thomas (2012).

of the Bank's position as the monopoly provider of central bank money in the United Kingdom. And it is because there is demand for central bank money — the ultimate means of settlement for banks, the creators of broad money — that the price of reserves has a meaningful impact on other interest rates in the economy.

The interest rate that commercial banks can obtain on money placed at the central bank influences the rate at which they are willing to lend on similar terms in sterling money markets — the markets in which the Bank and commercial banks lend to each other and other financial institutions. The exact details of how the Bank uses its money market operations to implement monetary policy has varied over time, and central bank operating procedures today differ somewhat from country to country, as discussed in Clews, Salmon and Weeken (2010).⁽¹⁾ Changes in interbank interest rates then feed through to a wider range of interest rates in different markets and at different maturities, including the interest rates that banks charge borrowers for loans and offer savers for deposits.⁽²⁾ By influencing the price of credit in this way, monetary policy affects the creation of broad money.

This description of the relationship between monetary policy and money differs from the description in many introductory textbooks, where central banks determine the quantity of broad money via a 'money multiplier' by actively varying the quantity of reserves.⁽³⁾ In that view, central banks implement monetary policy by choosing the quantity of reserves. And, because there is assumed to be a stable ratio of broad money to base money, these reserves are then 'multiplied up' to a much greater change in bank deposits as banks increase lending and deposits.

Neither step in that story represents an accurate description of the relationship between money and monetary policy in the modern economy. **Central banks do not typically choose a quantity of reserves to bring about the desired short-term interest rate.**⁽⁴⁾ **Rather, they focus on prices — setting interest rates.**⁽⁵⁾ The Bank of England controls interest rates by supplying and remunerating reserves at its chosen policy rate. The supply of both reserves and currency (which together make up base money) is determined by banks' demand for reserves both for the settlement of payments and to meet demand for currency from their customers — demand that the central bank typically accommodates.

This demand for base money is therefore more likely to be a consequence rather than a cause of banks making loans and creating broad money. This is because banks' decisions to extend credit are based on the availability of profitable lending opportunities at any given point in time. The profitability of making a loan will depend on a number of factors, as discussed earlier. One of these is the cost of funds that banks face, which is closely related to the interest rate paid on reserves, the policy rate.

In contrast, the quantity of reserves already in the system does not constrain the creation of broad money through the act of lending.⁽⁶⁾ This leg of the money multiplier is sometimes motivated by appealing to central bank reserve requirements, whereby banks are obliged to hold a minimum amount of reserves equal to a fixed proportion of their holdings of deposits. But reserve requirements are not an important aspect of monetary policy frameworks in most advanced economies today.⁽⁷⁾

A looser stance of monetary policy is likely to increase the stock of broad money by reducing loan rates and increasing the volume of loans. And a larger stock of broad money, accompanied by an increased level of spending in the economy, may cause banks and customers to demand more reserves and currency.⁽⁸⁾ So, in reality, the theory of the money multiplier operates in the reverse way to that normally described.

QE — creating broad money directly with monetary policy

The previous section discussed how monetary policy can be seen as the ultimate *limit* to money creation by commercial banks. But commercial banks could alternatively create too little money to be consistent with the economy meeting the inflation target. In normal times, the MPC can respond by lowering the policy rate to encourage more lending and hence more money creation. But, in response to the financial crisis, the MPC cut Bank Rate to 0.5% — the so-called effective lower bound.

Once short-term interest rates reach the effective lower bound, it is not possible for the central bank to provide further stimulus to the economy by lowering the rate at which reserves are remunerated.⁽⁹⁾ One possible way of providing further monetary stimulus to the economy is through a programme of asset purchases (QE). Like reductions in Bank

(1) The framework for the Bank's operations in the sterling money markets is set out in the Bank's 'Red Book', available at www.bankofengland.co.uk/markets/Documents/money/publications/redbook.pdf. Recent developments in sterling money markets are discussed by Jackson and Sim (2013).

(2) Bank of England (1999) discusses the transmission mechanism of monetary policy in more detail.

(3) Benes and Kumhof (2012) discuss the money multiplier myth in more detail.

(4) As discussed by Disyatat (2008).

(5) Bindseil (2004) provides a detailed account of how monetary policy implementation works through short-term interest rates.

(6) Carpenter and Demiralp (2012) show that changes in quantities of reserves are unrelated to changes in quantities of loans in the United States.

(7) The Bank of England currently has no formal reserve requirements, for example. (It does require banks to hold a proportion of non-interest bearing 'cash ratio deposits' with the Bank for a subset of their liabilities. But the function of these cash ratio deposits is non-operational. Their sole purpose is to provide income for the Bank.) Bernanke (2007) discusses how reserve requirements now present less of a constraint than in the past in the United States.

(8) Kydland and Prescott (1990) found that broad money aggregates led the cycle, while base money aggregates tended to lag the cycle slightly.

(9) If the central bank were to lower interest rates significantly below zero, banks could swap their bank reserves into currency, which would pay a higher interest rate (of zero, or slightly less after taking into account the costs of storing currency). Or put another way, the demand for central bank reserves would disappear, so the central bank could no longer influence the economy by changing the price of those reserves.

The information content of different types of money and monetary aggregates

One of the Bank of England's primary objectives is to ensure monetary stability by keeping inflation on track to meet the Government's 2% target. Milton Friedman (1963) famously argued that 'inflation is always and everywhere a monetary phenomenon'. So changes in the money supply may contain valuable information about spending and inflationary pressure in the economy. Since money is essential for buying goods and services, it is likely to contain **corroborative information** about the *current* level of nominal spending in the economy. It may also provide **incremental information** about *future* movements in nominal spending, and so can be a useful indicator of future inflationary pressure. Finally, the behaviour of money may help to reveal the **nature of the monetary transmission mechanism**, especially when monetary policy is operated through 'quantitative easing' (QE).

In practice, a key difficulty is assessing which measures of money are the appropriate ones to look at for each of the different purposes. The Bank currently constructs a number of monetary aggregates and publishes a range of data that allow to be created, summarised in **Table 1**. **Chart A** shows some long-run historical time series of the growth of monetary aggregates compared with that of nominal spending in the economy.⁽¹⁾ Given the various changes in the UK monetary regime over the past 150 years, it is unlikely that a single monetary indicator perfectly captures both the corroborative and incremental information in money. The UK financial sector has also undergone various structural changes that need to be taken into account when considering the underlying link between money and spending. For example, during periods when the financial sector has grown relative to the rest of the economy (such as in the early 1980s and the 2000s), broad money has tended to grow persistently faster than nominal spending.

Narrower measures of money, such as notes and coin and sight deposits (accounts that can be withdrawn immediately without penalty) are, in principle, better corroborative indicators of spending, as these are likely to be the types of money used to carry out the majority of transactions in goods and services in the economy. The sum of notes and coin and sight deposits held by the non-bank private sector is sometimes known as zero maturity money or 'MZM'.⁽²⁾

Broader measures of money might be more appropriate as incremental indicators of future spending and more revealing about the nature of the transmission mechanism. M2, for example, additionally includes household time deposits such as savings accounts.⁽³⁾ And M4 is an even broader measure, including all sight and time deposits held by non-financial companies and non-bank financial companies. The main article describes how QE works by first increasing the deposits of financial companies. As these companies rebalance their

portfolios, asset prices are likely to increase and, with a lag, lead to an increase in households' and companies' spending. So monitoring broad money has been an important part of assessing the effectiveness of QE.⁽⁴⁾

A number of econometric studies have suggested that sectoral movements in broad money may also provide valuable incremental information about spending in the economy.⁽⁵⁾ For example, non-financial companies' deposits appear to be a leading indicator of business investment in the economy. One can also try and weight different types of narrow and broad money together using some metric of how much each type of money is used in transactions — known as a Divisia index.⁽⁶⁾ In practice, the interest paid on a given type of money is typically used as a weighting metric. That is because individuals and companies are only likely to hold money which earns a low interest rate relative to other financial instruments if it compensates them by providing greater transactions services.

Identifying the appropriate measurement of money has been complicated by the continued development of the financial sector. This has both expanded the range of instruments that might serve as money and the range of financial institutions that borrow from and deposit with the traditional banking system. For example, sale and repurchase agreements (known as repos) — where a company agrees to buy a security from a bank with agreement to sell it back later — are currently included in M4 since the claim held on the bank can be thought of as a secured deposit.

In addition, some economists have argued that a range of instruments that provide collateral for various types of borrowing and lending could also be included in a broader measure of money.⁽⁷⁾ Moreover, many of the non-bank institutions that hold deposits mainly intermediate between banks themselves. The deposits of these institutions, known as 'intermediate other financial corporations' (IOFCs), are likely to reflect activities within the banking system that are not directly related to spending in the economy.⁽⁸⁾ For this reason, the Bank's headline measure of broad money is M4^{ex}, which excludes IOFC deposits.

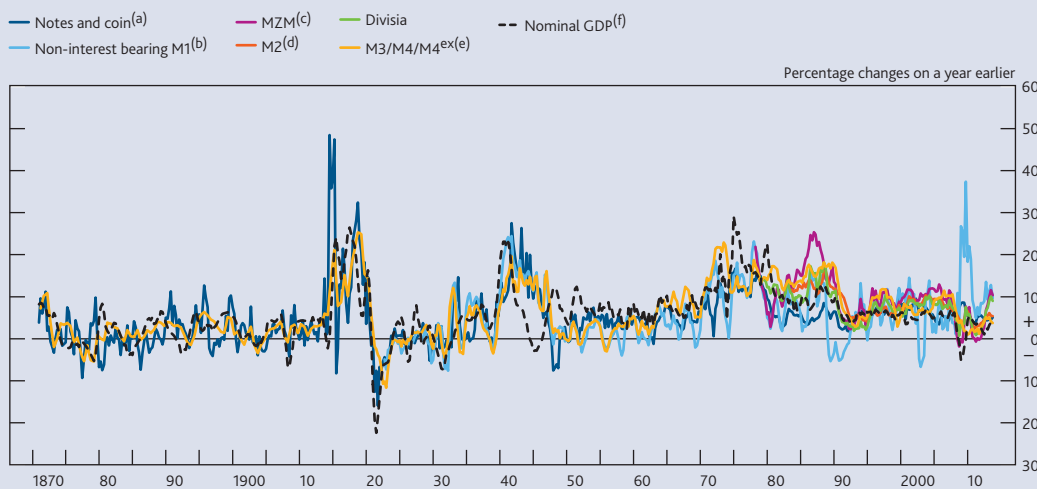
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- (1) These series involve splicing together current Bank of England data with historic data on monetary aggregates. A spreadsheet of the data is available at www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2014/longrunmoneydata.xls.
 - (2) A narrower measure known as non-interest bearing M1 can also be constructed. This measure has become a less useful aggregate as most sight deposits now pay some form of interest. For example, during the financial crisis when interest rates fell close to zero, the growth of non-interest bearing M1 picked up markedly as the relative cost of holding a non-interest bearing deposit fell sharply compared to an interest-bearing one. Focusing on M1 would have given a misleading signal about the growth of nominal spending in the economy.
 - (3) M2 contains the non-bank private sector's holdings of notes and coin plus 'retail' deposits which are deposits that pay an advertised interest rate. Those will largely be deposits held by households but will also apply to some corporate deposits.
 - (4) See Bridges, Rossiter and Thomas (2011) and Butt *et al* (2012).
 - (5) See, for example, Astley and Haldane (1995), Thomas (1997a, b) and Brigden and Mizen (2004).
 - (6) See Hancock (2005), for example.
 - (7) See, for example, Singh (2013).
 - (8) See Burgess and Janssen (2007) and www.bankofengland.co.uk/statistics/Pages/iadb/notesiadb/m4adjusted.aspx for more detail.

Table 1 Popular monetary aggregates that can be constructed from available UK data^(a)

Name	Definition	Description ^(b)	Availability
Notes and coin	Notes and coin in circulation outside the Bank of England.	The narrowest measure of money and used as an indicator of cash-based transactions.	1870–present ^(c)
M0	Notes and coin plus central bank reserves.	Historically the base measure of money used in money multiplier calculations. Often used as an approximate measure of the size of the Bank of England’s balance sheet. <i>No longer published by the Bank of England but can be reconstructed.^(d)</i>	1870–present ^(c)
Non-interest bearing M1	Notes and coin plus non-interest bearing sight deposits held by the non-bank private sector.	An indicator of transactions in goods and services in the economy, less useful now since most sight deposits pay some form of interest. <i>Not published by the Bank of England but can be constructed from published components.</i>	1921–present ^(c)
MZM	Notes and coin plus all sight deposits held by the non-bank private sector.	An indicator of transactions in goods and services in the economy. <i>Not published by the Bank of England but can be constructed from published components. The Bank also produces a measure based on an ECB definition of M1.</i>	1977–present
M2 or retail M4	Notes and coin plus all retail deposits (including retail time deposits) held by the non-bank private sector.	A broader measure of money than MZM encompassing all retail deposits. The key additions are household time deposits and some corporate retail time deposits. <i>Published by the Bank of England. The Bank also produces a measure based on an ECB definition of M2.</i>	1982–present
M3	Notes and coin plus all sight and time deposits held with banks (excluding building societies) by the non-bank private sector.	Up until 1987 the headline broad monetary aggregate constructed by the Bank of England. <i>The Bank also produces a measure based on an ECB definition of M3.</i>	1870–1990 ^(c)
M4	Notes and coin, deposits, certificates of deposit, repos and securities with a maturity of less than five years held by the non-bank private sector.	Up until 2007 the headline broad monetary aggregate constructed by the Bank of England.	1963–present
M4 ^{ex}	M4 excluding the deposits of IOFCs.	Since 2007 the headline broad monetary aggregate constructed by the Bank of England.	1997–present
Divisia	A weighted sum of different types of money.	Aims to weight the component assets of broad money according to the transactions services they provide. ^(e)	1977–present

(a) All definitions refer to sterling instruments only. Some of the definitions in this table were changed at various points in time. For example the original M3 aggregate included public sector deposits and the non-bank private sector’s holdings of deposits in foreign currency. A more comprehensive history of the development of UK monetary aggregates can be found at www.bankofengland.co.uk/statistics/Documents/ms/articles/art2jul03.pdf.
 (b) Published by the Bank of England unless otherwise stated.
 (c) This series uses the data constructed by Capie and Webber (1985).
 (d) Data on M0 were discontinued following reforms to the Bank of England’s money market operations in 2006. See www.bankofengland.co.uk/statistics/Documents/ms/articles/artjun06.pdf for more details.
 (e) The Divisia indices for other financial corporations and for the non-bank private sector were discontinued in 2013. See www.bankofengland.co.uk/statistics/Documents/ms/articles/art1aug13.pdf for more details.

Chart A Different monetary aggregates and nominal spending



Sources: Bank of England, Capie and Webber (1985), Mitchell (1988), ONS, Sefton and Weale (1995), Solomou and Weale (1991) and Bank calculations. All series seasonally adjusted and break-adjusted where possible. Historical data seasonally adjusted using X12.

(a) 1969 Q2 to 2013 Q4 — notes and coin in circulation. 1870 Q1 to 1969 Q2 — M0 from Capie and Webber (1985).
 (b) 1977 Q1 to 2013 Q4 — notes and coin held by the non-bank and building society private sector plus non-interest bearing deposits. Prior to 2008 Q1, excludes deposits with building societies. 1963 Q1 to 1977 Q1 — historical M1 data from *Bank of England Quarterly Bulletins*. 1921 Q4 to 1963 Q1 — Capie and Webber (1985).
 (c) Notes and coin held by the non-bank and building society private sector plus total sight deposits. Prior to 1998 Q4 excludes deposits with building societies.
 (d) Notes and coin and retail deposits held by the non-bank and building society private sector.
 (e) 1997 Q4 to 2013 Q4 — M4 excluding intermediate OFCs. 1963 Q1 to 1997 Q4 — M4. 1870 Q2 to 1963 Q1 — M3 from Capie and Webber (1985).
 (f) Composite estimate of nominal GDP at market prices. See appendix of Hills, Thomas and Dimsdale (2010) for details.

Rate, asset purchases are a way in which the MPC can loosen the stance of monetary policy in order to stimulate economic activity and meet its inflation target. But the role of money in the two policies is not the same.

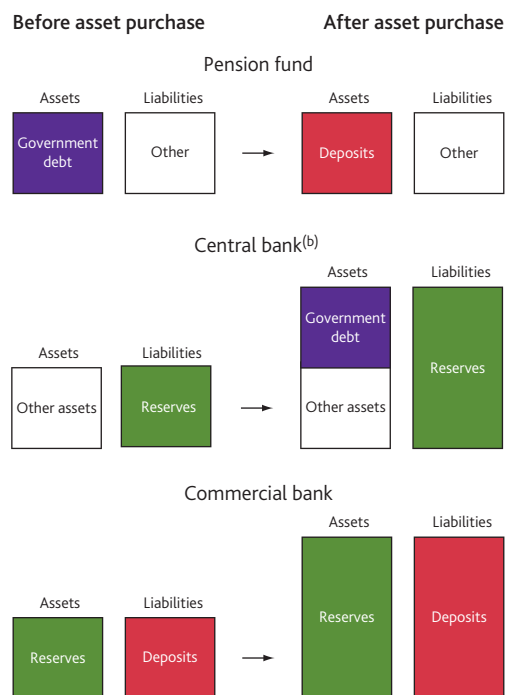
QE involves a shift in the focus of monetary policy to the quantity of money: the central bank purchases a quantity of assets, financed by the creation of broad money and a corresponding increase in the amount of central bank reserves. The sellers of the assets will be left holding the newly created deposits in place of government bonds. They will be likely to be holding more money than they would like, relative to other assets that they wish to hold. They will therefore want to rebalance their portfolios, for example by using the new deposits to buy higher-yielding assets such as bonds and shares issued by companies — leading to the ‘hot potato’ effect discussed earlier. This will raise the value of those assets and lower the cost to companies of raising funds in these markets. That, in turn, should lead to higher spending in the economy.⁽¹⁾ The way in which QE works therefore differs from two common misconceptions about central bank asset purchases: that QE involves giving banks ‘free money’; and that the key aim of QE is to increase bank lending by providing more reserves to the banking system, as might be described by the money multiplier theory. This section explains the relationship between money and QE and dispels these misconceptions.

The link between QE and quantities of money

QE has a direct effect on the quantities of both base and broad money because of the way in which the Bank carries out its asset purchases. The policy aims to buy assets, government bonds, mainly from non-bank financial companies, such as pension funds or insurance companies. Consider, for example, the purchase of £1 billion of government bonds from a pension fund. One way in which the Bank could carry out the purchase would be to print £1 billion of banknotes and swap these directly with the pension fund. But transacting in such large quantities of banknotes is impractical. These sorts of transactions are therefore carried out using electronic forms of money.

As the pension fund does not hold a reserves account with the Bank of England, the commercial bank with whom they hold a bank account is used as an intermediary. The pension fund’s bank credits the pension fund’s account with £1 billion of deposits in exchange for the government bonds. This is shown in the first panel of **Figure 3**. The Bank of England finances its purchase by crediting reserves to the pension fund’s bank — it gives the commercial bank an IOU (second row). The commercial bank’s balance sheet expands: new deposit liabilities are matched with an asset in the form of new reserves (third row).

Figure 3 Impact of QE on balance sheets^(a)



(a) Balance sheets are highly stylised for ease of exposition: quantities of assets and liabilities shown do not correspond to the quantities actually held by those sectors. The figure only shows assets and liabilities relevant to the transaction.

(b) Government debt is actually purchased by the Bank of England’s Asset Purchase Facility using a loan from the Bank of England, so does not actually appear directly on the Bank’s official consolidated balance sheet.

Two misconceptions about how QE works

Why the extra reserves are not ‘free money’ for banks

While the central bank’s asset purchases involve — and affect — commercial banks’ balance sheets, the primary role of those banks is as an *intermediary* to facilitate the transaction between the central bank and the pension fund. The additional reserves shown in **Figure 3** are simply a by-product of this transaction. It is sometimes argued that, because they are assets held by commercial banks that earn interest, these reserves represent ‘free money’ for banks. While banks do earn interest on the newly created reserves, QE also creates an accompanying liability for the bank in the form of the pension fund’s deposit, which the bank will itself typically have to pay interest on. In other words, QE leaves banks with both a new IOU *from* the central bank but also a new, equally sized IOU *to* consumers (in this case, the pension fund), and the interest rates on both of these depend on Bank Rate.

Why the extra reserves are not multiplied up into new loans and broad money

As discussed earlier, the transmission mechanism of QE relies on the effects of the newly created broad — rather than base — money. The start of that transmission is the creation of

(1) The ways in which QE affects the economy are covered in more detail in Benford *et al* (2009), Joyce, Tong and Woods (2011) and Bowdler and Radia (2012). The role of money more specifically is described in Bridges, Rossiter and Thomas (2011), Bridges and Thomas (2012) and Butt *et al* (2012).

bank deposits on the asset holder's balance sheet in the place of government debt (Figure 3, first row). Importantly, the reserves created in the banking sector (Figure 3, third row) do not play a central role. This is because, as explained earlier, banks cannot directly lend out reserves. Reserves are an IOU from the central bank to commercial banks. Those banks can use them to make payments to each other, but they cannot 'lend' them on to consumers in the economy, who do not hold reserves accounts. When banks make additional loans they are matched by extra deposits — the amount of reserves does not change.

Moreover, the new reserves are not mechanically multiplied up into new loans and new deposits as predicted by the money multiplier theory. QE boosts broad money without directly leading to, or requiring, an increase in lending. While the first leg of the money multiplier theory does hold during QE — the monetary stance mechanically determines the quantity of reserves — the newly created reserves do not, by themselves, meaningfully change the incentives for the banks to create new broad money by lending. It is possible that QE might indirectly affect the incentives facing banks to make new loans, for example by reducing their funding costs, or by increasing the quantity of credit by boosting activity.⁽¹⁾ But equally, QE could lead to companies repaying bank credit, if they were to issue more bonds or equity and use those funds

to repay bank loans. On balance, it is therefore possible for QE to increase or to reduce the amount of bank lending in the economy. However these channels were not expected to be key parts of its transmission: instead, QE works by circumventing the banking sector, aiming to increase private sector spending directly.⁽²⁾

Conclusion

This article has discussed how money is created in the modern economy. Most of the money in circulation is created, not by the printing presses of the Bank of England, but by the commercial banks themselves: banks create money whenever they lend to someone in the economy or buy an asset from consumers. And in contrast to descriptions found in some textbooks, the Bank of England does not directly control the quantity of either base or broad money. The Bank of England is nevertheless still able to influence the amount of money in the economy. It does so in normal times by setting monetary policy — through the interest rate that it pays on reserves held by commercial banks with the Bank of England. More recently, though, with Bank Rate constrained by the effective lower bound, the Bank of England's asset purchase programme has sought to raise the quantity of broad money in circulation. This in turn affects the prices and quantities of a range of assets in the economy, including money.

(1) A similar mechanism whereby QE could increase bank lending by enabling banks to attract more stable funding is discussed in Miles (2012).

(2) These channels, along with the effect of QE on bank lending more broadly, are discussed in detail in a box in Butt *et al* (2012).

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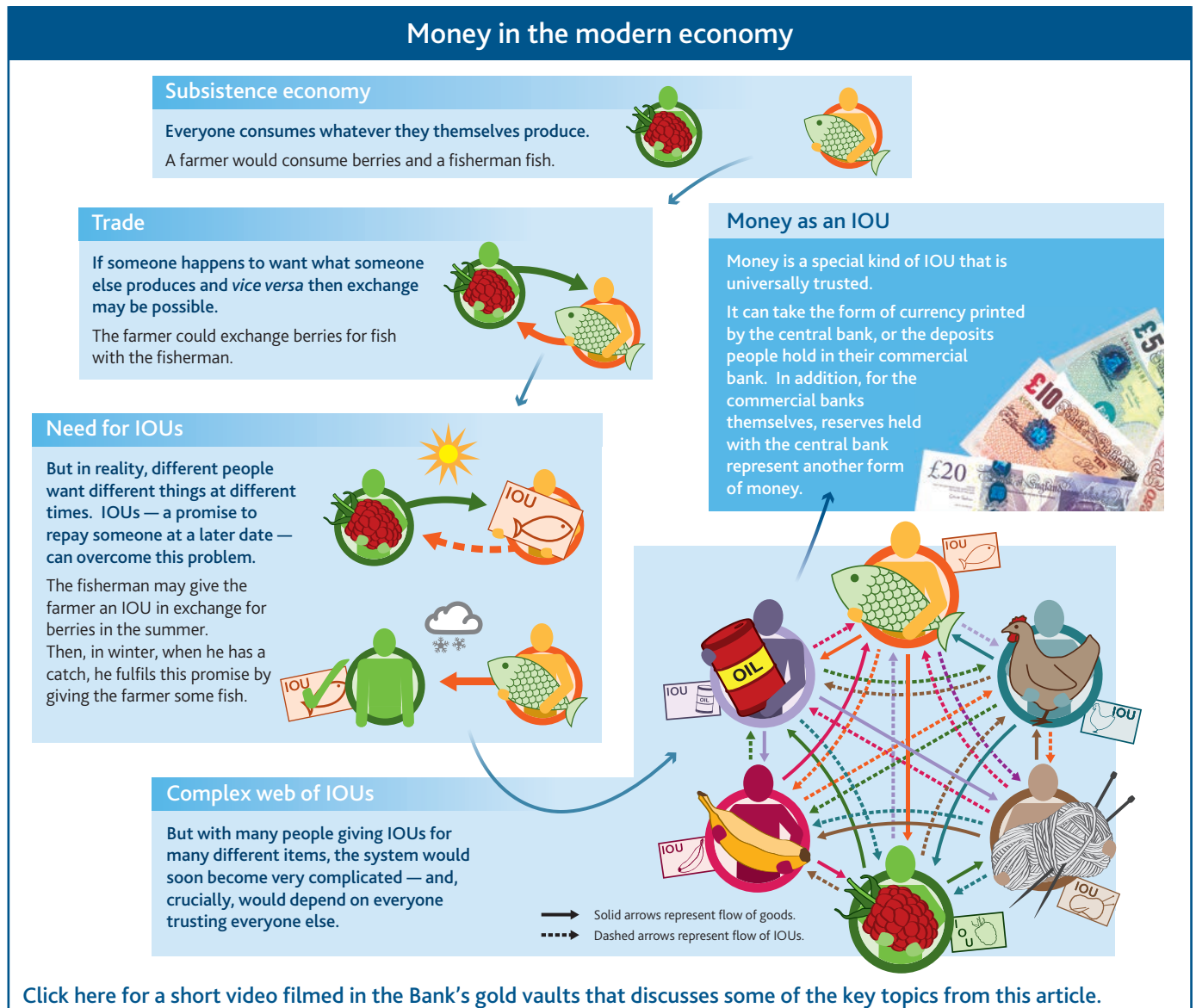
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Money in the modern economy: an introduction

By Michael McLeay, Amar Radia and Ryland Thomas of the Bank's Monetary Analysis Directorate.⁽¹⁾

- Money is essential to the workings of a modern economy, but its nature has varied substantially over time. This article provides an introduction to what money is today.
- Money today is a type of IOU, but one that is special because everyone in the economy trusts that it will be accepted by other people in exchange for goods and services.
- There are three main types of money: currency, bank deposits and central bank reserves. Each represents an IOU from one sector of the economy to another. Most money in the modern economy is in the form of bank deposits, which are created by commercial banks themselves.



(1) The authors would like to thank Lewis Kirkham for his help in producing this article.

Most people in the world use some form of money on a daily basis to buy or sell goods and services, to pay or get paid, or to write or settle contracts. Money is central to the workings of a modern economy. But despite its importance and widespread use, there is not universal agreement on what money actually is. That is partly because what has constituted money has varied over time and from place to place.

This article provides an introduction to the role of money in the modern economy. It does not assume any prior knowledge of economics before reading. The article begins by explaining the concept of money and what makes it special. It then sets out what counts as money in a modern economy such as the United Kingdom, where 97% of the money held by the public is in the form of deposits with banks, rather than currency.⁽¹⁾ It describes the different types of money, where they get their value from and how they are created. A box briefly outlines some recent developments in payment technologies. A companion piece to this *Bulletin* article, 'Money creation in the modern economy',⁽²⁾ describes the process of money creation in more detail, and discusses the role of monetary policy and the central bank in that process. For expository purposes this article concentrates on the United Kingdom, but the issues discussed are equally relevant to most economies today. A short video explains some of the key topics covered in this article.⁽³⁾

What counts as money?

Many different goods or assets have been used as money at some time or in some place. **Goods** are things that are valued because they satisfy people's needs or wants, such as food, clothes or books. An **asset**, such as machinery, is something that is valuable because it can be used to produce other goods or services. So which goods or assets should be described as money? One common way of defining money is through the functions it performs. This approach traditionally suggests that money should fulfil three important roles.

The first role of money is to be a **store of value** — something that is expected to retain its value in a reasonably predictable way over time. Gold or silver that was mined hundreds of years ago would still be valuable today. But perishable food would quickly become worthless as it goes bad. So gold or silver are good stores of value, but perishable food much less so.

Money's second role is to be a **unit of account** — the thing that goods and services are priced in terms of, for example on menus, contracts or price labels. In modern economies the unit of account is usually a currency, for example, the pound in the United Kingdom, but it could be a type of good instead. In the past, items would often be priced in terms of something

very common, such as staple foods ('bushels of wheat') or farm animals.

Third, money must be a **medium of exchange** — something that people hold because they plan to swap it for something else, rather than because they want the good itself. For example, in some prisoner of war camps during the Second World War, cigarettes became the medium of exchange in the absence of money.⁽⁴⁾ Even non-smokers would have been willing to exchange things for cigarettes; not because they planned to smoke the cigarettes, but because they would later be able to swap them for something that they did want.

These functions are all closely linked to each other. For example, an asset is less useful as the medium of exchange if it will not be worth as much tomorrow — that is, if it is not a good store of value. Indeed, in several countries where the traditional currency has become a poor store of value due to very high rates of price inflation, or hyperinflation, foreign currencies have come to be used as an alternative medium of exchange. For example, in the five years after the end of the First World War, prices of goods in German marks doubled 38 times — meaning that something that cost one mark in 1918 would have cost over 300 billion marks in 1923.⁽⁵⁾ As a result, some people in Germany at the time began to use other currencies to buy and sell things instead. To make sure sterling does not lose its usefulness in exchange, one of the Bank of England's objectives is to safeguard the value of the currency. Although the medium of exchange needs to be a good store of value, there are many good stores of value that are not good media of exchange.⁽⁶⁾ Houses, for example, tend to remain valuable over quite long periods of time, but cannot be easily passed around as payment.

Similarly, it is usually efficient for the medium of exchange in the economy to also be the unit of account.⁽⁷⁾ If UK shops priced items in US dollars, while still accepting payment only in sterling, customers would have to know the sterling-dollar exchange rate every time they wanted to buy something. This would take time and effort on the part of the customers. So in most countries today shops price in terms of whatever currency is the medium of exchange: pounds sterling in the United Kingdom.⁽⁸⁾

(1) As of December 2013. Throughout this article 'banks' and 'commercial banks' are used to refer to banks and building societies together.

(2) See pages 14–27 in this *Bulletin*.

(3) See www.youtube.com/watch?v=ziTE32hiWdk.

(4) See Radford (1945).

(5) See Sargent (1982).

(6) See Ostroy and Starr (1990).

(7) Brunner and Meltzer (1971) give a detailed exposition of how using an asset as the unit of account can support its use as the medium of exchange.

(8) This has not always been true in many countries, and in some places today there are still separate media of exchange and units of account for some transactions. Doepke and Schneider (2013) give several examples.

Historically, the role of money as the medium of exchange has often been viewed as its most important function by economists.⁽¹⁾ Adam Smith, one of the founding fathers of the discipline of economics and the current portrait on the £20 note, saw money as an essential part of moving from a **subsistence economy**, or autarky, to an **exchange economy**. In a subsistence economy, everyone consumes only what they produce. For example, Robinson Crusoe, stranded alone on a desert island, has no need for money as he just eats the berries he gathers and the animals he hunts.⁽²⁾ But it is more efficient for people to specialise in production, producing greater amounts of one good than they need themselves and then trading with one another. If Robinson Crusoe is a natural forager, for instance, then he could focus his effort on picking berries, while his friend Man Friday, a skilled fisherman, could devote all of his time to fishing. The two could then trade with one another and each consume more berries and fish than if each of them had split his time between picking berries and catching fish.⁽³⁾

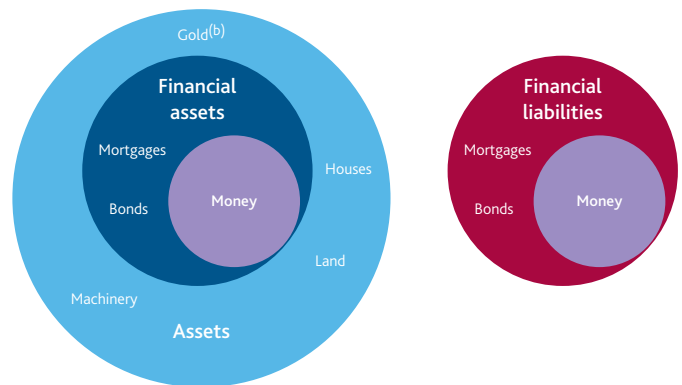
Money is an IOU

While Robinson Crusoe and Man Friday could simply swap berries for fish — without using money — the exchanges that people in the modern economy wish to carry out are far more complicated. Large numbers of people are involved.⁽⁴⁾ And — crucially — the timing of these exchanges is not typically coincident. Just as people do not always want to consume the same type of goods they have produced themselves, they do not always want to consume them *at the same time* that they produce them. Robinson Crusoe may gather a large amount of berries during summer, when they are in season, while Man Friday may not catch many fish until autumn. In the modern economy, young people want to borrow to buy houses; older people to save for retirement; and workers prefer to spend their monthly wage gradually over the month, rather than all on payday. These patterns of demand mean some people wish to borrow and others wish to hold claims — or IOUs — to be repaid by someone else at a later point in time. **Money in the modern economy is just a special form of IOU, or in the language of economic accounts, a financial asset.**

To understand money as a financial asset, it is helpful to first consider the wide range of different types of asset that people hold (individually or as companies). Some of these assets are shown in **Figure 1**. Non-financial assets such as capital (for example machinery), land and houses are shown in light blue. Each non-financial asset can produce goods and services for its owners. For instance, machinery and land can be used to make products or food; houses provide people with the service of shelter and comfort; and gold can be made into forms that people desire, such as jewellery.

It is possible for some of these non-financial assets (or even the goods that they produce) to serve some of the functions

Figure 1 Money and other assets and liabilities^(a)



- (a) Figure is highly stylised for ease of exposition: the quantities of each asset/liability shown do not correspond to the actual quantities in the economy.
 (b) By statistical convention, some holdings of gold (such as by the government) are classed as a financial asset rather than a non-financial asset in economic accounts.

of money. When goods or assets that would be valuable for other purposes are used as money, they are known as **commodity money**. For instance, Adam Smith described how 'iron was the common instrument of commerce among the ancient Spartans' and 'copper among the ancient Romans'.⁽⁵⁾ Many societies have also used gold as commodity money. The use of commodities which are valuable in their own right as money can help people to have confidence that they will be able to exchange them for other goods in future. But since these commodities have other uses — in construction, say, or as jewellery — there is a cost to using them as money.⁽⁶⁾ So in the modern economy, money is instead a financial asset.

Financial assets are simply claims on someone else in the economy — an IOU to a person, company, bank or government. A financial asset can be created by owners of non-financial assets. For example, a landowner might decide to lease some of his or her land to a farmer in return for some of the future harvests. The landowner would have less land than before, but would instead have a financial asset — a claim on future goods (food) produced by the farmer using the asset (land). In reality, however, most financial assets are actually claims on other financial assets. Most people considering buying a bond of a company (a type of IOU from the company to the bondholder), such as a farm, would not want to be repaid with food. Instead, contracts such as bonds usually state that the bondholder is owed a certain amount of money, which the farm can get by selling its food.

- (1) The historical origins of money are a matter of considerable debate. See Chapter 1 of Manning, Nier and Schanz (2009) for a discussion.
 (2) Robinson Crusoe was a fictional character in an 18th century novel by Daniel Defoe, who was shipwrecked on an island.
 (3) Smith (1766) described how 'in a nation of hunters, if anyone has a talent for making bows and arrows better than his neighbours he will at first make presents of them, and in return get presents of their game'.
 (4) As Smith (1776) noted, 'when the division of labour first began to take place, this power of exchanging must have been very much clogged and embarrassed in its operations'.
 (5) Smith (1776).
 (6) The next section discusses other disadvantages of using commodities as money or linking money to commodities.

Because financial assets are claims on someone else in the economy, they are also financial liabilities — one person's financial asset is always someone else's debt. So the size of the financial liabilities in a closed economy is equal to the size of the financial assets, as depicted in Figure 1.⁽¹⁾ If a person takes out a mortgage, they acquire the obligation to pay their bank a sum of money over time — a liability — and the bank acquires the right to receive those payments — an asset of the same size.⁽²⁾ Or if they own a company bond, they have an asset but the company has an equally sized liability. In contrast, non-financial assets are not claims on anyone else. If someone owns a house or some gold, there is no corresponding person indebted by that amount — so there are no non-financial liabilities. If everyone in the economy were to pool all of their assets and debts together as one, all of the financial assets and liabilities — including money — would cancel out, leaving only the non-financial assets.

Why money is special

In principle, there might be no need for a special financial asset such as money to keep track of who is owed goods and services. Everyone in the economy could instead create their own financial assets and liabilities by giving out IOUs every time they wanted to purchase something, and then mark down in a ledger whether they were in debt or credit in IOUs overall. Indeed, in medieval Europe merchants would often deal with one another by issuing IOUs. And merchant houses would periodically settle their claims on one another at fairs, largely by cancelling out debts.⁽³⁾ But such systems rely on everyone being confident that everyone else is completely trustworthy.⁽⁴⁾ Otherwise, people would worry that some of the IOUs they were holding might be from people who would not pay them back when they came to redeem them. Even if they trusted everyone who they had lent to directly, they may worry that those people held IOUs from untrustworthy people, and therefore would not be able to repay their own IOUs.

Money is a *social institution* that provides a solution to the problem of a lack of trust.⁽⁵⁾ It is useful in exchange because it is a special kind of IOU: in particular, **money in the modern economy is an IOU that everyone in the economy trusts**. Because everyone trusts in money, they are happy to accept it in exchange for goods and services — it can become universally acceptable as the medium of exchange. Only certain types of IOU can obtain that status. For example, if a type of IOU is not widely trusted to be repaid, it is less likely to be acceptable in exchange — and less like money. The next section of the article explains what types of IOU function as money in the modern economy, and how those particular IOUs became trusted enough to be universally acceptable in exchange.

Different types of money

The previous section explained that although many goods or assets can fulfil some of the functions of money, money today is a special type of IOU. To understand that further, it is useful to consider some of the different types of money that circulate in a modern economy — each type representing IOUs between different groups of people. All of these types of money, along with various other commonly used terms related to money are set out in a glossary (Table A) at the end of the article. For this article, the economy is split into three main groups: the central bank (in the United Kingdom, the Bank of England); the commercial banks (for example, high street banks such as Barclays and Lloyds); and the remaining private sector of households and companies, hereon referred to as 'consumers'.

Economic commentators and academics often pay close attention to the amount of 'broad money' circulating in the economy. This can be thought of as the money that consumers have available for transactions, and comprises: **currency** (banknotes and coin) — an IOU from the central bank, mostly to consumers in the economy; and **bank deposits** — an IOU from commercial banks to consumers.⁽⁶⁾ Broad money is a useful concept because it measures the amount of money held by those responsible for spending decisions in the economy — households and companies. A box in the companion article explains what information different measures of money can reveal about the economy.

A different definition of money, often called 'base money' or 'central bank money', comprises IOUs from the central bank: this includes **currency** (an IOU to consumers) but also **central bank reserves**, which are IOUs from the central bank to commercial banks. Base money is important because it is by virtue of their position as the only issuer of base money that central banks can implement monetary policy.⁽⁷⁾ The companion article explains how the Bank of England varies the interest rate paid on reserves to affect spending and

(1) A closed economy, such as Robinson Crusoe's desert island, is an economy that does not conduct any exchanges with outside economies.

(2) Note that the sum the mortgagor has to pay back over time will typically be greater than the amount they originally borrowed. That is because borrowers will usually have to pay interest on their liabilities, to compensate the lender for the inconvenience of holding an IOU that will only be repaid at a later date.

(3) Medieval fairs and their economic significance are discussed in more detail in Braudel (1982).

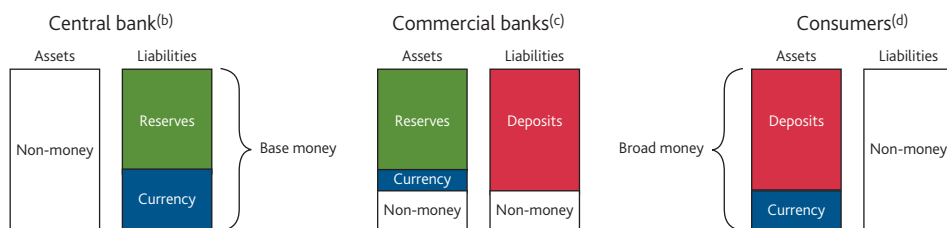
(4) The importance of a lack of trust as a necessary condition for the existence of money is emphasised in papers by Kiyotaki and Moore (2001, 2002), who famously argue that 'evil is the root of all money'. Kocherlakota (1998) points out that a lack of a record of all transactions is another necessary condition. Earlier work by Brunner and Meltzer (1971) and King and Plosser (1986) also argues that there must be some impediment to stop a credit system being used instead of money.

(5) King (2006) provides a detailed account of money as a social institution.

(6) The definition of broad money used by the Bank of England, M4^{ex}, also includes a wider range of bank liabilities than regular deposits; see Burgess and Janssen (2007) for more details. For simplicity, this article describes all of these liabilities as deposits.

(7) Some Scottish and Northern Irish commercial banks are also allowed to issue their own banknotes, but to do so they must also hold an equal amount of Bank of England banknotes or reserves deposited at the Bank of England, meaning their issuance does not change the amount of base money. Notes held at the Bank may include £1 million notes (Giants) and £100 million notes (Titans).

Figure 2 Stylised balance sheets of different types of money holders and issuers in the economy^(a)



- (a) Balance sheets are highly stylised for ease of exposition: the quantities of each type of money shown do not correspond to the quantities actually held on each sector's balance sheet.
 (b) Central bank balance sheet only shows base money liabilities and matching assets. In practice the central bank holds other non-money liabilities. Its non-money assets are mostly made up of government debt. Although that government debt is held by the Bank of England's Asset Purchase Facility, so does not appear directly on the Bank of England's consolidated balance sheet.
 (c) Commercial banks' non-money assets would include government debt and non-money liabilities would include long-term debt and equity.
 (d) Consumers represent the private sector of households and companies. Balance sheet only shows broad money assets and corresponding liabilities. Consumers' non-money liabilities would include secured and unsecured loans.

inflation in the economy, along with the amounts of the different types of money.

Who owes who? Mapping out the IOUs

Drawing a **balance sheet** is a useful way to map out the IOUs of different people to each other. As discussed previously, each IOU is a **financial liability** for one person, matched by a **financial asset** for someone else. Then, for any individual, their balance sheet simply adds together, on one side, all of their assets — their IOUs *from* other people and their non-financial assets; and on the other, all of their liabilities (or debt) — their IOUs *to* other people.⁽¹⁾

You can add together the individuals in each group to get a consolidated balance sheet, which shows the IOUs of that group to the other groups in the economy.⁽²⁾ **Figure 2** shows a stylised balance sheet of assets and liabilities for each of the three groups in the economy. The different types of money are each shown in a different colour: currency in blue, bank deposits in red and central bank reserves in green. Broad money is therefore represented by the sum of the red and the blue assets held by consumers, whereas base money is the sum of all of the blue and the green assets. (Note that the balance sheets are not drawn to scale — in reality the amount of broad money is greater than the amount of base money.) Each type of money features on the balance sheets of at least two different groups, because each is an asset of one group and a liability of another. There are also lots of other assets and liabilities which do not fulfil the functions of money (everything except the lilac circles in **Figure 1**); some of these are shown in white in **Figure 2**. For example, consumers hold loans such as mortgages, which are liabilities of the consumer and assets of the consumer's bank.

The rest of this section discusses each of the three types of money in more detail, explaining why it is valued and briefly describing how it is created.⁽³⁾ A box on page 9 briefly outlines some recent developments in payment technologies and alternative currencies that have led to the creation of different instruments that have some similarities with money.

(i) Fiat currency — banknotes and coin

What is it?

Currency is made up mostly of **banknotes** (around 94% of the total by value as of December 2013), most of which are an IOU from the Bank of England to the rest of the economy.⁽⁴⁾ Currency is mostly held by consumers, although commercial banks also hold small amounts in order to meet deposit withdrawals. As stated in their inscription, banknotes are a 'promise to pay' the holder of the note, on demand, a specified sum (for example £5). This makes banknotes a liability of the Bank of England and an asset of their holders, shown in blue on their balance sheets in **Figure 2**.

When the Bank of England was founded in 1694, its first banknotes were convertible into gold. The process of issuing 'notes' that were convertible into gold had started earlier than this, when goldsmith-bankers began storing gold coins for customers. The goldsmiths would give out receipts for the coins, and those receipts soon started to circulate as a kind of money. The Bank of England would exchange gold for its banknotes in a similar way — it stood ready to swap its notes back into gold on demand. Other than a few short periods, that was how currency worked for most of the next 250 years — the 'gold standard'.⁽⁵⁾ But the Bank permanently abandoned offering gold in return for notes in 1931 so that Britain could better manage its economy during the Great Depression, as discussed below.

Since 1931, Bank of England money has been fiat money. **Fiat or 'paper' money is money that is not convertible to any other asset (such as gold or other commodities).**

- (1) As a convention total assets and liabilities must balance. If assets are greater than debt, the difference is defined as that asset holder's equity capital. For example, a consumer with no debt would have equity equal to the value of their assets. For an introduction to capital in the context of banks, see Farag, Harland and Nixon (2013).
 (2) Debts to other individuals within the group are cancelled out, leaving only IOUs to and from other groups.
 (3) Ryan-Collins *et al* (2011) provide a detailed introductory account of where money comes from.
 (4) The remaining roughly 6% of the currency in circulation is made up of coins, which are produced by The Royal Mint. Of the banknotes that circulate in the UK economy, some are issued by some Scottish and Northern Irish commercial banks.
 (5) There were several periods, particularly during wars, when the Bank temporarily stopped exchanging gold for notes. HM Treasury also issued notes at the outbreak of the First World War — these 'Treasury Notes' could be converted to coins and remained in circulation until 1928.

Recent developments in payment technologies and alternative currencies

The recent past has seen a wave of innovation in payment technologies and alternative currencies. This box briefly outlines some of these developments, focusing on how they relate to the concept of money discussed in the main article. Overall, while they perform — to a varying extent — some of the functions of money, at present they are not typically accepted as a medium of exchange to the same extent that currency, central bank reserves or bank deposits are.

One set of innovations allows households and businesses to convert bank deposits into other, purely electronic forms of money (sometimes referred to as 'e-money') that can be used to carry out transactions. These technologies aim to improve the process of making payments. Examples include PayPal and Google Wallet. Just as it may be more convenient to carry out transactions using bank deposits rather than banknotes, for some transactions it may also be more convenient to use money in an e-money account rather than banknotes or bank deposits. These forms of money have some similar features to bank deposits. For example, money in an e-money account represents a store of value so long as the companies providing it are seen as trustworthy. E-money can also be used as a medium of exchange with businesses (such as online sellers) or individuals that accept it. However, it is still not as widely accepted as other media of exchange, for instance, it is not generally accepted by high street shops. Transactions using these technologies are also typically denominated in the existing unit of account (pounds sterling in the United Kingdom).

Another set of innovations have served to introduce a new unit of account. These schemes aim to encourage economic

activity within a defined environment, and include local currencies, such as the Bristol, Brixton or Lewes Pounds in the United Kingdom.⁽¹⁾ Local currencies are discussed in detail in a previous *Bulletin* article (Naqvi and Southgate (2013)). These forms of money can be obtained in exchange for currency at fixed rates: for example, one pound sterling can be swapped for one Bristol Pound. Local currency can then be exchanged for goods and services that can be priced in their own unit of account — Brixton Pounds rather than pounds sterling. As a result their use as a medium of exchange is intentionally limited. For example, the Lewes Pound can only be used at participating retailers, which must be located in the Lewes area.

A further category of innovations is digital currencies, such as Bitcoin, Litecoin and Ripple. The key difference between these and local currencies is that the exchange rate between digital currencies and other currencies is not fixed. Digital currencies are not at present widely used as a medium of exchange. Instead, their popularity largely derives from their ability to serve as an asset class. As such they may have more conceptual similarities to commodities, such as gold, than money. Digital currencies also differ from the other technologies discussed so far in this box because they can be created out of nothing, albeit at pre-determined rates. In contrast, local currencies come into circulation only when exchanged for pounds sterling. While the amount of money held in e-money accounts or local currencies depends entirely on demand, the supply of digital currencies is typically limited.

(1) While local, or complementary, currencies are not a new innovation, they have only recently become adopted by a number of UK areas. See Naqvi and Southgate (2013) for more details.

Because fiat money is accepted by everyone in the economy as the medium of exchange, although the Bank of England is in debt to the holder of its money, that debt can only be repaid in more fiat money. The Bank of England promises to honour its debt by exchanging banknotes, including those no longer in use, for others of the same value forever. For example, even after its withdrawal on 30 April 2014, the £50 note featuring Sir John Houblon will still be swapped by the Bank for the newer £50 note, which features Matthew Boulton and James Watt.

Why do people use it?

Fiat money offers advantages over linking money to gold when it comes to managing the economy. With fiat money, changes in the demand for money by the public can be matched by changes in the amount of money available to them. When the amount of money is linked to a commodity, such as gold, this

places a limit on how much money there can be, since there is a limit to how much gold can be mined. And that limit is often not appropriate for the smooth functioning of the economy.⁽¹⁾ For example, abandoning the gold standard in 1931 allowed Britain to regain more control of the amount of money in the economy. The United Kingdom was able to reduce the value of its currency relative to other countries still linking their currency to gold (and this was accompanied by an increased amount of money in circulation), which some economic historians argue helped Britain avoid facing as deep a recession as many other countries around the world in the 1930s.⁽²⁾

(1) There could also be too much creation of money in periods where the amount of that commodity grows quickly. In the 16th century, Spain experienced a prolonged period of higher inflation after it imported large amounts of gold and silver from the Americas.

(2) Temin (1989) and Eichengreen (1992) conduct detailed analysis of countries' economic performance under the gold standard and during the Great Depression.

Although there are advantages to using fiat money for the *economy as a whole*, these may not be realised unless *individuals* decide they want to use it in exchange. And, if banknotes are not directly convertible into a real good of some kind, what makes them universally acceptable in exchange? One answer is that the trusted medium of exchange just emerges over time as a result of a social or historical convention. There are many such conventions that emerge in society. For example, motorists in the United Kingdom drive on the left-hand side of the road, and this convention began when enough drivers became confident that most others would do the same.⁽¹⁾ But equally the convention could have become driving on the right, as it did in many other countries.

In the case of money, however, the state has generally played a role in its evolution.⁽²⁾ To be comfortable holding currency, people need to know that at some point someone would be prepared to exchange those notes for a real good or service, which the state can help guarantee. One way it can do this is to make sure that there will always be demand for the currency by accepting it as tax payments. The government can also influence that demand somewhat by deeming that currency represents 'legal tender'.⁽³⁾

Even if the state does underpin the use of currency in this way, that by itself does not ensure that people will (or are legally bound to) use it. They need to trust that their banknotes are valuable, which means that it is important that banknotes are difficult to counterfeit.⁽⁴⁾ They also need to have faith that the value of their banknotes will remain broadly stable over time if they are to hold them as a store of value and be able to use them as a medium of exchange. This generally means the state must ensure a low and stable rate of inflation.

Since abandoning the gold standard in 1931, various other ways of keeping the value of money stable have been tried, with differing degrees of success. For example, in the 1980s, policy aimed to keep the rate at which the amount of broad money in the economy was growing stable over time.⁽⁵⁾ Since 1992, the Bank has had an inflation target for consumer prices. The inflation target means that the Bank is committed to aiming to keep the value of money relatively stable in terms of the number of goods and services it can buy. So instead of being confident that their banknotes will be worth a certain amount of gold, people can expect that they will be worth a stable amount of real products from one year to the next.

How is it created?

The Bank of England makes sure it creates enough banknotes to meet the public's demand for them. The Bank first arranges the printing of new banknotes by a commercial printer. It then swaps them with commercial banks for old banknotes — those

which are no longer fit to be used or are part of a series that has been withdrawn. These old notes are then destroyed by the Bank.

The demand for banknotes has also generally increased over time. To meet this extra demand, the Bank also issues banknotes over and above those needed to replace old banknotes.⁽⁶⁾ The extra newly issued notes are bought by the commercial banks from the Bank of England. The commercial banks pay for the new currency, a paper IOU of the Bank of England, by swapping it for some of their other, electronic IOUs of the Bank — central bank reserves. The size of their balance sheets in **Figure 2** would be unchanged, but the split between the green and blue components would be altered.⁽⁷⁾

(ii) Bank deposits

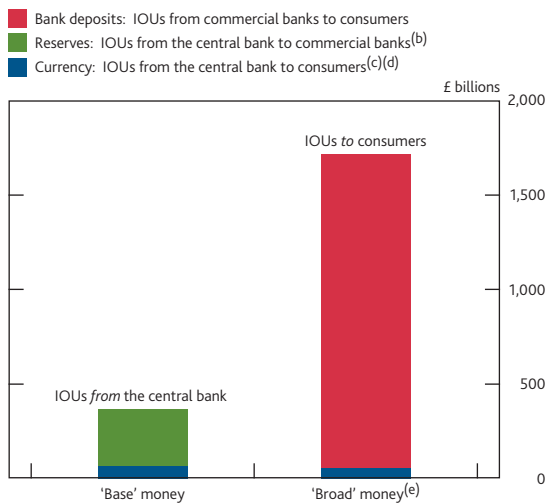
What are they?

Currency only accounts for a very small amount of the money held by people and firms in the economy. The rest consists of deposits with banks, as shown in **Chart 1**. For security reasons, consumers generally do not want to store all of their assets as physical banknotes. Moreover, currency does not pay interest, making it less attractive to hold than other assets, such as bank deposits, that do. For these reasons, consumers prefer to mostly hold an alternative medium of exchange — **bank deposits**, shown in red in **Figure 2**. Bank deposits can come in many different forms, for example current accounts or savings accounts held by consumers or some types of bank bonds purchased by investors. In the modern economy these tend to be recorded electronically. For simplicity, this article focuses on households' and firms' deposits with banks, as these most clearly function as money.

Why do people use them?

When a consumer makes a deposit of his or her banknotes with a bank, they are simply swapping a Bank of England IOU for a commercial bank IOU. The commercial bank gets

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- (1) Young (1998) explains that these conventions were largely formed in Europe when people still drove horse-drawn carriages, rather than cars. They were then later enshrined in law, guaranteeing that people would follow the convention.
 - (2) Goodhart (1998) argues that historical evidence suggests the state was crucial in the development of money as a medium of exchange. He contrasts that view with the position of Menger (1892), who proposes a more natural evolution.
 - (3) For example, Bank of England banknotes are the only notes that are legal tender in England and Wales. But that legal tender status only has a narrow meaning relating to the repayment of debts. In ordinary transactions it has little practical application, since whether a currency is used as the medium of exchange depends only on whether there is agreement between the two parties carrying out the exchange.
 - (4) For information on current security features and education materials, see www.bankofengland.co.uk/banknotes/Pages/educational.aspx.
 - (5) See Cairncross (1995) or Wood (2005) for detailed histories of monetary policy regimes in the United Kingdom.
 - (6) See Allen and Dent (2010) for a full description of the Note Circulation Scheme.
 - (7) As shown in **Figure 2**, Bank of England currency is matched on the other side of the central bank's balance sheet by non-money assets, which in normal times were typically sterling money market instruments or government bonds. These assets pay interest, while currency does not. The income from those assets (after deducting the Bank's costs of issuing notes) is paid to HM Treasury, and is known as 'seigniorage'.

Chart 1 Amounts of money in circulation^(a)

- (a) All data are for December 2013.
 (b) Reserves balances at the Bank of England held by banks and building societies, non seasonally adjusted. Data are measured as the monthly average of weekly data.
 (c) Currency in base money includes notes and coin in circulation outside the Bank of England, including those in banks' and building societies' tills. Data are measured as the monthly average of weekly data.
 (d) Currency in broad money includes only those notes and coins held by the non-bank private sector, measured as the month-end position.
 (e) M4 excluding intermediate other financial corporations.

extra banknotes but in return it credits the consumer's account by the amount deposited. Consumers only swap their currency for bank deposits because they are confident that they could always be repaid. Banks therefore need to ensure that they can always obtain sufficient amounts of currency to meet the expected demand from depositors for repayment of their IOUs. For most household depositors, these deposits are guaranteed up to a certain value, to ensure that customers remain confident in them.⁽¹⁾ This ensures that bank deposits are trusted to be easily convertible into currency and can act as a medium of exchange in its place.

In the modern economy, bank deposits are often the default type of money. Most people now receive payment of their salary in bank deposits rather than currency. And rather than swapping those deposits back into currency, many consumers use them as a store of value and, increasingly, as the medium of exchange. For example, when a consumer pays a shop by debit card, the banking sector reduces the amount it owes to that consumer — the consumer's deposits are reduced — while increasing the amount it owes to the shop — the shop's deposits are increased. The consumer has used the deposits directly as the medium of exchange without having to convert them into currency.

How are they created?

Unlike currency, which is created by the Bank of England, **bank deposits are mostly created by commercial banks themselves.** Although the stock of bank deposits increases whenever someone pays banknotes into their account, the amount of bank deposits is also reduced any time anyone makes a withdrawal. Moreover, as **Chart 1** shows, the

amount of currency is very small compared to the amount of bank deposits. Far more important for the creation of bank deposits is the act of making new loans by banks. When a bank makes a loan to one of its customers it simply credits the customer's account with a higher deposit balance. At that instant, new money is created.

Banks can create new money because bank deposits are just IOUs of the bank; banks' ability to create IOUs is no different to anyone else in the economy. When the bank makes a loan, the borrower has also created an IOU of their own to the bank. The only difference is that for the reasons discussed earlier, the bank's IOU (the deposit) is widely accepted as a medium of exchange — it is money. Commercial banks' ability to create money is not without limit, though. The amount of money they can create is influenced by a range of factors, not least the monetary, financial stability and regulatory policies of the Bank of England. These limits, and the money creation process more generally, are discussed in detail in the companion piece to this article.

(iii) Central bank reserves

Commercial banks need to hold some currency to meet frequent deposit withdrawals and other outflows. But to use physical banknotes to carry out the large volume of transactions they do with each other would be extremely cumbersome. So banks are allowed to hold a different type of IOU from the Bank of England, known as **central bank reserves** and shown in green in **Figure 2**. Bank of England reserves are just an electronic record of the amount owed by the central bank to each individual bank.

Reserves are a useful medium of exchange for banks, just as deposits are for households and companies. Indeed, reserves accounts at the central bank can be thought of as playing a similar role for commercial banks as current accounts serve for households or firms. If one bank wants to make a payment to another — as they do every day, on a large scale, when customers make transactions — they will tell the Bank of England who will then adjust their reserves balances accordingly. The Bank of England also guarantees that any amount of reserves can be swapped for currency should the commercial banks need it. For example, if lots of households wanted to convert their deposits into banknotes, commercial banks could swap their reserves for currency to repay those households. As discussed earlier, as the issuer of currency, the Bank of England can make sure there is always enough of it to meet such demand.

⁽¹⁾ The Financial Services Compensation Scheme offers protection for retail deposits up to £85,000 per depositor per Prudential Regulation Authority authorised institution. For more information see www.fscs.org.uk.

Conclusion

This article has introduced what money means and the different types of money that exist in a modern economy. Money today is a form of debt, but a special kind of debt that is accepted as the medium of exchange in the economy. And

most of that money takes the form of bank deposits, which are created by commercial banks themselves. A companion piece to this article, 'Money creation in the modern economy', describes the process of money creation by commercial banks in more detail.

Table A Glossary of different types of money and different names for money^(a)

Name	Description	Also known as
Bank deposits	Type of IOU from a commercial bank to a person or company.	Inside money (if not matched by outside money on bank balance sheets).
Base money	Central bank reserves + currency.	Monetary base. Central bank money. Outside money (in the United Kingdom). High-powered money. M0.
Broad money	Currency held by the private sector (other than banks) + bank deposits (and other similar short-term liabilities of commercial banks to the rest of the private sector).	M4 ^{ex} (headline measure of broad money used by the Bank of England — excludes the deposits of certain financial institutions, known as intermediate other financial corporations (IOFCs), in order to provide a measure of money more relevant for spending in the economy). M4 (includes the deposits of IOFCs). M3 (older definition that did not include building society deposits).
Central bank reserves	Type of IOU from the central bank to a commercial bank.	
Commodity money	A commodity with intrinsic value of its own that is used as money because it fulfils the main functions — such as gold coins.	
Currency	Type of IOU (in paper banknote or coin form), largely from the central bank to the holder of the note.	Notes and coin.
Fiat money	Money that is irredeemable — it is only a claim on further fiat money.	

(a) A box in 'Money creation in the modern economy' explains how different measures of money are useful in understanding the economy.

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