

How Money is Really Created and Why it Matters

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December 1, 2021

The money multiplier

One of the most common explanations of how money is created, which is often taught in textbooks too, is the money multiplier theory of credit creation. In this theory commercial banks act as financial intermediaries, lending deposits out and therefore mediating between savers and investors. Unfortunately, this approach does not accurately describe how money is created in modern economies. Let us first consider the above-mentioned theory of money creation before examining an alternative. A multiplier in economics generally shows the change of a given endogenous variable in response to a change of a given exogenous variable. The money multiplier does exactly that. It shows the change in the total money supply given an initial change in deposits and a given reserve ratio. The reserve ratio is set by the central bank and requires banks to hold a fraction of their deposits as reserves at the central bank. This is best illustrated by a simple example. Let us assume that the reserve ratio (RR) is 0.1 and Person A deposits 100 Euros into Bank K. Bank K must then hold 10 Euros as reserves

at the ECB but loans the remaining 90 Euros out to Person B and so increases the money supply by 90 Euros. Person B buys something from cooperation L. Cooperation L can deposit the 90 Euros into its Bank M. Bank M must then hold 9 Euros as reserves at the ECB and is free to lend out the remaining 81 Euros, adding 81 Euros to the money supply. As the reserve requirement is 0.1, with every round a loan equal to 0.9 (1-RR) of each deposit, is created. This means that if this process is repeated indefinitely the total increase of the money supply can be calculated as an infinite sum with a common difference of (1-RR):

$$\frac{1}{1-c} = \frac{1}{1-(1-RR)} = \frac{1}{RR}$$

This sum is called the money multiplier. In our case an initial deposit of 100 Euros would have created 900 Euros of new money (We must first multiply the initial deposit with the multiplier, here equal to 10, and then subtract the initial deposit from the result). For this theory to be true, the reserve requirement, which the central bank determines, must be a binding constraint on lending. However, today most central set the price of reserves and therefore short-term interest rates rather than the quantity of reserves. Additionally, the money multiplier stops working when the reserve ratio approaches zero, which is the case in many countries today. At zero the multiplier is not defined. Theoretically banks could lend an infinite amount if the RR is zero and consequently the RR would no longer be a constraint to money creation anyway.

How money is created in modern economies

In modern economies the money multiplier theory is inaccurate. Banks are not merely intermediaries

and loans create deposits, not the other way around. This fact is quite simply explained by double entry accounting. Every time a commercial bank grants a loan to a customer it creates both an asset and a liability. This means that when it creates a loan it must also create a new deposit of the same size, and so generates new money. Below, a simplified balance sheet illustrates this process.

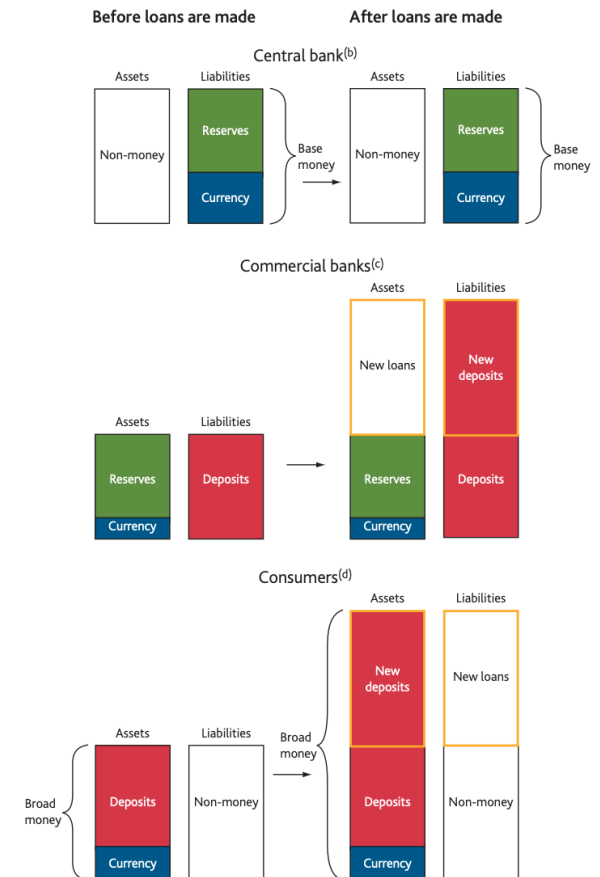


Figure 1: Simplified balance sheet.

Source: Bank of England

The balance sheet shows that as the commercial bank extends a new loan its assets and liabilities

increase proportionally and so do the assets and liabilities of the consumer. Of course, the newly created deposits do not have to remain at the initial bank. If a customer was to take out a loan to buy a house, the seller would probably be the client of a different bank to which the deposits would then be transferred. The loan is an asset to the bank and a liability to the consumer, whereas the deposit is a liability to the bank and an asset to consumer. The balance sheet of the central bank remains unchanged when the demand for reserves does too. If the bank demanded more reserves after the creation of the loan, the central bank would simply supply new reserves by extending their balance sheet too. Reserves are not a limiting factor in the creation of money. Credit creation is not the only method with which commercial banks can create money. A commercial bank also creates money when it buys assets from consumers, the government, or companies in the non-banking sector. Just as money can be created it can also be eliminated. If a customer pays back their loan or the bank sells assets, money is destroyed. Whether the money supply increases or decreases over a given period therefore depends on the net creation of money. If there were more loans extended over a year than were being destroyed, the money supply would increase that year.

Factors determining the quantity of money

The explanation above does not imply that banks can or indeed want to create unlimited amounts of money. The creation of credit and therefore of money is essentially constrained by the demand and supply for loans in the economy. Commercial banks risk and profitability calculations, consumer behaviour, monetary policy and the general state of

the economy all influence the supply and demand for loans. The business model of a commercial bank largely depends on the credit spread, i.e., the difference between the interest rate they pay depositors and the interest rate they charge on loans. It consequently must find the right balance between a high enough rate on deposits and a low enough rate on loans to attract new customers. Another factor that limits the supply of loans are capital ratios. Under Basel 3 banks are required to maintain a capital ratio of 8 percent. The ratio measures the bank's capital in relation to its assets. Every time a bank extends a loan this ratio decreases, and the bank must then ensure it raises enough capital to achieve the required ratio again (this happens over longer periods of time of course). So, the banks intention and ability to raise capital will have an effect on the quantity of loans they grant. The capital ratio is also linked to the credit risk a bank is confronted with, meaning the risk of borrowers that the bank lends to defaulting on their loans. To mitigate this risk capital may be raised, which would increase the capital ratio, or interest rates on loans may be raised to compensate for the risk of defaulting. Consumer behaviour also plays an important rule. Whether the money supply increases or decreases depends on the reaction of consumers when they receive a newly created money. When a consumer takes out a new loan to buy a car for example, the seller of the car may use the received money to pay of their own debt at another bank. This way money is being created and destroyed and the net effect on the money supply would likely be close to zero. However, if the seller of the car has no outstanding debt, or does not intend to pay it off, they may choose to spend it. The person then receiving the amount

spent can then again either spend it or pay off outstanding debt. Depending on whether this spending continues for a prolonged period the money supply may increase. This process is also influenced by the general economic conditions. If unemployment is low and interest rates are low too, consumers may be incentivised to spend rather than to pay off debt and banks might be incentivised to lend more due to increasing collateral. Monetary policy is the third important determinant. In times of loose monetary policy, where interest rates are low, and liquidity is relatively cheap banks are more willing to lend and consumers more willing to borrow. For banks the cost of liquidity decreases and therefore they will lower their interest rates on loans and deposits which at the same time decreases their credit risk. For consumers the cost of borrowing decreases, which should lead to increased demand for loans. Together these factors, among others, determine the level of money creation and therefore the money supply.

Implications

The discussion above shows that commercial banks are not merely financial intermediaries. They do not simply mediate between savers and borrowers by lending out deposits to clients but are responsible for most of the money creation in modern economies. Thus, commercial banks have a much more central role to play than is suggested by the money multiplier theory. What are the implications of this conclusion? One implication has to do with financial crisis. The two main methods of mitigating the effects of financial crises are monetary and fiscal policy. An easing of monetary policy, *ceteris paribus*, is supposed to lower the cost of borrowing, encourage

investment, and eventually boost aggregate demand. However, the analysis from the previous chapters implies that there are more ways to encourage investment, i.e., lending and borrowing, than lowering the interest rate, which undoubtedly is an essential tool, nevertheless. To encourage lending and borrowing, the required capital ratio requirement could be lowered, which would make it easier for banks to grant loans as they would not have to raise as much capital every time. At the same time consumers behaviour could be influenced in a way that would incentivise them to spend the newly created money and to not pay existing debt of. This could then lead to higher demand instead of lower debt, which in the short term at least can be helpful during a recession. Furthermore, the creation of money or more specifically the quality and the quantity of loans created by commercial banks impact economic growth. If banks were to only lend money to firms, that are willing and able to productively invest, create new jobs etc. the money supply would widen, and the short-term growth rate would likely increase. Of course, consumer and firm behaviour is also significant for this process. If they decide to use newly created money to pay off debt, there would obviously be no new investment and therefore no impact on growth. The implication is that the standards banks are given in terms of lending and the behaviour of consumers and firms in the economy have a potential impact on economic growth in the short-term.

Conclusion

The considerations of the previous chapters have shown that the process of money creation is not accurately explained by the money multiplier but by an

approach which focuses on the balance sheet of commercial banks. Consequently loans create deposits (money) and banks have a much more important role in the economy than suggested by the money multiplier where banks are merely intermediaries. There are different implications of this inference. One is that there are many factors that influence the quantity of money created and hence the money supply. Additionally, economic growth in the short-term may also be affected by the process of credit creation.