

HOW BANKS CREATE & DESTROY MONEY



A GUIDE TO THE EUROZONE MONETARY SYSTEM

"Every loan, overdraft, or bank purchase creates a deposit, and every repayment of a loan, overdraft, or bank sale destroys a deposit"

Right Honourable Reginald McKenna (1924)
Former British Chancellor of the Exchequer and Chairman of the Midland Bank

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1. Types of money

There are three types of money denominated in Euros in the European economy:

1.1 Cash & Coins

Physical money, cash and coins, are created and issued by the Central Bank of Ireland under the approval of the European Central Bank.¹ The profit that the national central banks of the Eurozone receive from the low-cost production and sale of cash is known as seigniorage. The profits gained from seigniorage, and other activities, by the national central banks are pooled together and redistributed to the various Finance Departments of the Governments of the Eurozone. Seigniorage is a source of non-tax revenue and the proportion a country receives from the 'profit pool' depends on its population and its contribution to GDP. Both factors hold equal weighting.² Seigniorage used to be a significant source of revenue for the Department of Finance. However, it's of limited benefit in today's digital world and this is one reason why the Department of Finance is under pressure to invent new taxes. Of course, it is inconvenient to use cash for larger transactions. This is one of the reasons why today cash makes up less than 6% of the Irish money supply.³

1.2 Central Bank Reserves

Central bank reserves are a type of electronic money, created by the national central banks of the Eurozone and used by banks to make payments to each other.⁴ In some respects they are like an electronic version of cash. However, members of the public and normal businesses cannot access central bank reserves. They are only available to those organisations who have accounts at the Central Bank of Ireland, i.e. banks. Central bank reserves are not usually counted as part of the money supply for the economy because they are only used by banks to make payments between themselves.

1.3 Bank Account Money

The third type of money accounts for approximately 97% of the Eurozone money supply.⁵ However, unlike central bank reserves and cash, it is not created by the central bank or any other part of Government. Instead, bank account money is created by the commercial banks usually in the process of advancing loans. Today, this type of money is created electronically by typing a higher bank balance into the borrower's account. Prior to computers, banks created the vast majority of money in the economy by simply writing a higher bank balance to a loan recipient's account which was recorded on their ledgers.

2. Understanding Balance Sheets

Because almost all money exists as accounting entries on the books of either the commercial banks or the Central Bank an understanding of some basic accounting is helpful. The key to understanding banking is the balance sheet. This is a record of:

1. Everything the bank owns.
2. Everything that other people owe to the bank. e.g. mortgages, loans, etc.
3. Everything the bank owes to other people.
4. Whatever is left over for the shareholders.

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

Assets	Liabilities
What the Bank Owns	
(Buildings, Cash in Tills, Government Bonds)	
+	
What is Owed to the Bank	
(Debts from Loans, Mortgages and overdrafts)	

When a loan is given by a bank, the borrower signs a contract committing to repay the full loan, plus interest. This legally binding contract is worth as much as the borrower commits to repay and so can be considered an asset in accounting terms.

The other side of the balance sheet records the 'liabilities' of the bank and includes everything the bank owes to others and whatever it owes its shareholders.

Assets	Liabilities
	What the Bank to Others
	(This includes the balance of every current account and savings account held with the bank)
	+
	Whatever they owe to their Shareholders (Shareholder's Equity)

3. How Central Banks Create Money

3.1 Creating Central Bank Reserves

Under normal circumstances, the Central Bank of Ireland creates the electronic money that banks use to make payments to each other. Central bank reserves are created by the national central banks of the Eurozone in order to facilitate payments between the commercial banks.⁴ (More detail on how banks clear interbank payments is given in section 6). The European Central Bank ultimately creates very few Euros, printed or otherwise, and does not create national central bank reserves.⁶

In the following example we will show how the Central Bank of Ireland creates central bank reserves for use by a commercial bank, in this example AIB. Initially the Central Bank's balance sheet appears as follows. This is a simplified example where we've ignored everything except this particular transaction:

Central Bank of Ireland's Balance Sheet	
Assets	Liabilities
	AIB's Reserve Account
€0	€0

And AIB, who for simplicity we imagine owns €10,000's worth of government bonds and owes €10,000 to its shareholders, have a balance sheet which looks like:

AIB's Balance Sheet	
Assets	Liabilities
Government Bonds	Shareholder's Equity
€10,000	€10,000

AIB contacts the central bank and informs them that they would like €10,000 in central bank reserves.

3.2 The Sale and Repurchase Agreement

The usual method by which the Central Bank of Ireland facilitates such a request is through what is known as a sale and repurchase agreement (an RP or repo). Essentially AIB sells an existing asset to the central bank, usually a Government bond, in exchange for brand new central bank reserves, while agreeing to repurchase said asset for a specific higher price on a specific future date.⁷ If the repurchase price is 5% higher than the purchase price (i.e. €10,500) then the 'repo rate' is said to be 5%. Once the sale is complete the Central Bank of Ireland has gained €10,000 of Government bonds, but it now has a liability to AIB of €10,000, which is represented as follows:

Central Bank of Ireland's Balance Sheet	
Assets	Liabilities
Government Bonds €10,000	AIB's Reserve Account €10,000

The Central Bank of Ireland's balance sheet has 'expanded' by €10,000, and €10,000 of new central bank reserves have been created in order to pay for the €10,000 in Government bonds.

AIB's Balance Sheet	
Assets	Liabilities
Central Bank Reserves €10,000	Shareholder's Equity €10,000

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

Banks transfer central bank reserves to each other as settlement for interbank payments and AIB now has additional reserves with which to clear debts with other banks. AIB may feel it's in a better position to create new money itself since it may be meeting its minimum reserve requirements etc.

3.3 Why use a Sale and Repurchase Agreement

A repo transaction may seem like a convoluted way of creating central bank reserves. And it is. To complicate matters further the Central Bank of Ireland's balance sheet would show the Government bonds as an asset of only €10,000 even though AIB has agreed to purchase them for €10,500 in the future.⁸ And contrary to the simplified look at AIB's balance sheet above, in actual fact AIB would still record the Government bonds as an asset of €10,000 on its balance sheet and would record its repayment agreement as a liability, although only to the value of €10,000, not €10,500. The additional €500 isn't recorded on either balance sheet but once paid it would momentarily be recorded as profit for the Central Bank of Ireland and as a loss by AIB.⁹ But only momentarily; the reason being that the Central Bank of Ireland pays interest on reserves that the commercial banks keep with them and they match the interest rate to the repo rate, 5% in the above example. The interest rate in question is called the 'deposit facility' and it's set for all national central banks of the Eurozone by the Governing Council of the European Central Bank.

It is worth noting that while the above creation of reserves occurred using a repo transaction involving existing assets, the Central Bank of Ireland could also create the reserves and lend them to AIB. In this case the assets side of the Central Bank of Ireland's balance sheet would show a €10,000 loan to AIB rather than €10,000 of Government bonds.

A sale and repurchase agreement, involving each party matching accrued interest to the difference in value of an asset over time, may seem a bit odd. However this arrangement has developed for two reasons.

First of all, it means that banks are not penalised for holding central bank reserves. If they exchanged assets for central bank reserves and agreed to repurchase those assets for a higher price they'd be continuously making a loss on holding reserves. They receive interest on reserves to compensate them for having to repurchase assets for a higher price in the future.

However the main reason for this situation is that the European Central Bank uses the 'deposit facility' in conjunction with its 'marginal lending facility' to influence the rate at which banks will lend central bank reserves to each other. This consequently changes the interest rate which the banks charge on creating bank account money for customers. High interest rates are used to discourage the creation of bank account money, in times of high inflation, while low interest rates are used to encourage the creation of bank account money, in times of recession.

For example, the Governing Council of the European Central Bank could dictate that the Central Bank of Ireland will pay an interest rate of 0.25% per annum, the 'deposit facility rate', on central bank reserves to the commercial banks. Hence AIB would not lend reserves to

National Irish Bank for less than 0.25% per annum.

On the upper scale the Governing Council of the European Central Bank may decide that the Central Bank of Ireland will charge 1.75% per annum, the 'marginal lending facility', to any bank that wishes to borrow new central bank reserves from them at short notice, i.e. overnight. In this case there's no way National Irish Bank would borrow reserves from AIB for an interest rate of more than 1.75% per annum and ultimately the banks will agree to lend central bank reserves to each other at somewhere between the two limits. The Euro Interbank Offer Rate (Euribor) tracks a summary of the average of previous rates that banks agree between themselves. Whatever rate the banks decide between them will be similar to the interest rates that the banks offered to potential borrowers for new bank account money.

Longer term borrowing of central bank reserves, still usually limited to a week, can be agreed at a lower interest rate with the national central banks than their overnight marginal lending facility.¹⁰ This is done through the ECB's 'main refinancing operations' as either a 'fixed rate tender' or 'minimum bid rate'. A fixed rate tender is the interest rate at which the national central banks will charge the commercial banks for new central bank reserves for such week long repos.

At other times the ECB prefers to have the banks bid for how much they are willing to pay for borrowing new central bank reserves. In this case the ECB would set a minimum bid rate that banks will have to offer. Banks may offer above the minimum bid rate because the national central banks process the most competitive bids more promptly.¹¹

3.4 The European Central Bank Rarely Creates Euros

The European Central Bank only prints around 8% of all printed Euros which themselves form only 3% of all Euros in circulation. The ECB doesn't create any central bank reserves or bank account money. In theory a central bank can never be insolvent since as a last resort it could print money to cover its liabilities. Of course in practise it would not be feasible to physically print cash to cover even a slight fraction of the ECB's liabilities.

3.5 An Explanation of Quantitative Easing

If the Central Bank of Ireland were independent it could purchase assets from any commercial bank operating in Ireland directly by using newly created money for the purpose. In effect, the Central Bank of Ireland would agree to borrow money from itself. Its debt to itself becomes somewhat of a token liability while its promise to pay said debt becomes its asset and can be used as central bank reserve money. It could then use this money to purchase whatever asset it sees fit from the banks. This is how the quantitative easing programme of other economies is conducted and the commercial banks can exchange a potentially depreciating asset for central bank reserves. The banks are then said to be well capitalised which means

they can easily meet minimum reserve requirements, clear debts with each other and are in a better position to create new bank account money as a result. However, even under quantitative easing it is still the case that for new bank account money to enter the economy someone has to organise a loan from a commercial bank and people may not be willing or able to borrow even from a well capitalised banking sector.

3.6 How Central Banks Create Money as Cash

The process by which the Central Bank of Ireland sells cash to banks is similar to that used for reserves. Initially the Central Bank of Ireland's balance sheet appears as follows:

Central Bank of Ireland's Balance Sheet	
Assets	Liabilities
Government Bonds	AIB's Reserve Account
€10,000	€10,000

And AIB's balance sheet appears as:

AIB's Balance Sheet	
Assets	Liabilities
Central Bank Reserves	Shareholder's Equity
€10,000	€10,000

If AIB decides it is expecting an increase in demand for cash, for example during the Christmas period, then it may wish to exchange some of its electronic central bank reserves for physical cash. The process by which it does so is very simple – AIB exchanges €10,000 of its central bank reserves for €10,000 cash which the Central Bank of Ireland has had freshly printed once granted the permission to do so by the European Central Bank.¹

The Central Bank of Ireland's liabilities change from €10,000 in AIB's reserve account, to €10,000 of 'cash outstanding' essentially to balance the books.

Central Bank of Ireland's Balance Sheet	
Assets	Liabilities
Government Bonds €10,000	AIB's Reserve Account €0
	Cash Outstanding €10,000

Meanwhile, AIB's assets have changed from €10,000 of central bank reserves to €10,000 in cash:

AIB's Balance Sheet	
Assets	Liabilities
Central Bank Reserves €0	Shareholder's Equity €10,000
Cash in Hand €10,000	

Note that neither balance sheet has expanded or contracted; it is just the nature of assets and liabilities that have changed. When the cash is worn out, damaged, or not needed anymore, the transaction is reversed and AIB simply sells back the cash to the Central Bank of Ireland at face value, receiving €10,000 in central bank reserves in return.

4. How Banks Create Money

This section describes how commercial banks create the type of money that appears in your bank account which is the same type of money that facilitates almost every transaction in the economy.

4.1 Processing Loans

A customer, who we will call Joe, walks into AIB and asks to borrow €10,000 to buy a new car. Joe signs a contract confirming that he will repay €10,000 over a period of five years, plus interest. This legally enforceable contract represents a future income stream for the bank and it will be included as an additional asset worth €10,000. It is only recorded as an asset of €10,000 even though Joe has agreed to repay more than €10,000. The interest Joe agrees to pay isn't recorded on the bank's balance sheet.

AIB's Balance Sheet	
Assets	Liabilities
Joe's Debt €10,000	

Joe, having committed to pay the bank €10,000, wants to receive his 'loan'. So AIB opens up an account for him and types in €10,000. This is recorded as a liability on AIB's balance sheet.

AIB's Balance Sheet	
Assets	Liabilities
Joe's Debt €10,000	Joe's Current Account €10,000

The reason the money in your current account is considered a liability of your bank is because technically it's not money. Technically it's an agreement from the bank to pay you cash or coins to that amount as the only form of legal tender in the economy. Of course for all intents and purposes your bank balance is money and money in current accounts and savings account form the vast majority of all the money in the Eurozone.⁵

Notice that no money was transferred or taken from any other account, the bank simply updated a computer database. A bank does not 'lend' money in the sense that a loan is not a loan of pre-existent money. As such, banks are not the financial intermediaries that economics often teaches they are. For clarity, the money banks lend does not come from other people's deposits or savings, nor from central bank reserves or funds from the bank's shareholders.

The vast majority of the economy's money is created this way and this is why almost every Euro has a corresponding debt.

4.2 Purchasing Assets

Banks also create money when they buy assets, be they real or financial. For example, if National Irish Bank wished to buy an existing €10,000 government bond from a pension fund company the transaction would proceed as follows. For simplicity let's assume that the pension fund company have an account with National Irish Bank although if this isn't the case the transaction can still go ahead through the exchange of central bank reserves with the pension fund company's bank as described in section 6. Initially National Irish Bank's balance sheet appears as follows:

National Irish Bank's Balance Sheet	
Assets	Liabilities
€0	€0

National Irish Bank has to manage its liabilities in certain ways and is limited to what it can create for itself somewhat by its own liquidity and solvency management criteria. It also has to comply with rules set out by the ECB and most recently by the Basel Committee on Banking Supervision (Basel Accords III). Assuming it's well capitalised with central bank reserves it can take on the additional €10,000 liability it will create an account for the Pension fund and record a balance of €10,000 in it.

In exchange the bank receives a government bond worth €10,000 which it records as an asset.

National Irish Bank's Balance Sheet	
Assets	Liabilities
	Pension Fund Company's
Government Bonds	Current Account
€10,000	€10,000

4.3 A Note on the ECB's Long Term refinancing Operations

Between December 2011 and February 2012 the ECB created and lent over a trillion euro of central bank reserves through the national central banks to the commercial banks at a low rate of interest repayable over three years. The banks, being well capitalised, were then able to create money through purchasing assets, usually Government bonds, rather than loans. For clarity the commercial banks can't use central bank reserves to purchase anything. Rather they create the money they use to purchase assets by typing it in to the seller's account.

4.4 A Description of how Banks Process Promissory Notes

Banks borrow central banks reserves off each other. Prior to 2008 German banks easily met their reserve requirements and were in a position to lend some of their excess reserves. Meanwhile, banks in Ireland were struggling to meet their reserve requirements but still had many customers looking to take out loans. The German banks lent some central bank reserves to the Irish banks and in doing so they swapped one asset (central bank reserves) for another (The Irish bank's debt to them). This allowed the Irish banks to create more bank account money for Irish borrowers.

When Anglo Irish Bank went bankrupt its debt to the German bank was swapped for a promissory note.

4.5 Banks do not Fund Loans through Loans from Other Banks

For clarity, German/French banks did not lend money to Irish banks who in turn lent it to Irish loan customers. The process happened as described above. If Irish banks processed any loans for Irish customers they'd create a separate asset and liability on their books in

accordance with section 4.1 unrelated to any reserve account liabilities or promissory note liabilities it may have with other banks.

4.6 Why Writing off Reserve Account Debts and Promissory Notes is a Last Resort

If German banks lost an asset such as Anglo's debt to them, they would be short of central bank reserves themselves. They may not meet reserve requirements and they'd be reluctant to create any new money for the German economy themselves. Defaulting on promissory notes or 'burning the bondholders' is a last resort for policy makers.

4.7 Why do Banks need Depositors and Savers?

Banks need customers and hence they need depositors.

Banks sometimes encourage customers to open up savings accounts with the bank and they do so to manage the maturity of their liabilities and 'free up' some central bank reserves. If you open up a savings account with your own bank, the bank swaps a short-notice liability (your current account balance) for a longer term one (your savings account balance). No asset is created but the bank would know you can't transfer this money for some time and so no other bank will come looking for a portion of it in central bank reserves for some time. Even though the bank hasn't gained any extra central bank reserves it's still in a better position to create new bank account money for its customers.

If you bank with Bank A and opened up a savings account with Bank B money will leave your current account at Bank A and enter your savings account at Bank B. Bank A would transfer some central bank reserves to Bank B. Bank B would then have gained central bank reserves and a long-term liability which means these additional reserves won't be transferred to another bank for some time. And so Bank B would be in a far better position to create new bank account money for its customers than before.

5. How Banks Destroy Money

5.1 How Banks Destroy Money Through Loan Repayments

As we have seen when banks make loans new money, in the form of numbers in somebody's bank account, is created. So too is a corresponding debt.

It is also the case that when a loan is repaid to a bank the money no longer exists. The principle is the same for all electronic money including central bank reserves. This section explains it in terms of bank account money.

In the example above Joe borrowed €10,000 to buy a car. Let's imagine that he now wishes to repay this loan. For simplicity let's imagine the loan is repaid in one lump sum, rather than in instalments as is usually the case.

Recall the situation directly after Joe secured the loan: the bank has an asset of €10,000, which is Joe's promise to repay the loan, and liabilities totalling the same amount. Joe has a debt to his bank of €10,000:

AIB's Balance Sheet	
Assets	Liabilities
Joe's Debt €10,000	Joe's Current Account €0
Central Bank Reserves €0	Shareholder's Equity €10,000

For simplicity, imagine Joe is paid €11,000 by his employer. This payment is made from Joe's employer's bank account to Joe's account electronically. If Joe's employer banks with AIB they lower his account by €11,000 and increase Joe's by the same amount without getting the Central Bank of Ireland involved.

Assuming Joe's boss banks with NIB, NIB will transfer €11,000 in central bank reserves to AIB, as explained in section 6, who will then be in a position to increase Joe's account by the same amount:

AIB's Balance Sheet	
Assets	Liabilities
Joe's Debt €10,000	Joe's Current Account €11,000
Central Bank Reserves €11,000	Shareholder's Equity €10,000

Joe decides to use the €11,000 to repay his loan in full which includes €1,000 of interest. From Joe's perspective, he sees that the €11,000 is 'gone' from his account by AIB. However, in reality, no money is moved at all. AIB simply decreases its liability to Joe by €11,000, and simultaneously removes the €10,000 loan from its assets, because the loan has been 'repaid'.

AIB's Balance Sheet	
Assets	Liabilities
Joe's Debt €0	Joe's Current Account €0
Central Bank Reserves €11,000	Shareholder's Equity €11,000

Joe now has no money in his bank account and he also has no debt. The result is that the €10,000 no longer exists. If loan repayments are greater than new loans the money supply can decrease and this is why there can be less money during a recession. AIB's assets have increased from €10,000 when they made the loan, to €11,000 now the loan has been repaid. AIB's liabilities have also increased from €10,000 to €11,000 since they owe their shareholders the profit of €1,000 as well as their original investment of €10,000.

In reality some of this increase in shareholder equity is likely to be used to pay the running costs of the business etc. For example, AIB may take the €1000 in profit and divide it equally between shareholders and staff as follows:

AIB's Balance Sheet	
Assets	Liabilities
Joe's Debt €0	Staff/Shareholder's Current Accounts €1000
Central Bank Reserves €11,000	Shareholder's Equity €10,000

5.2 How Banks Destroy Money Through Sale of an Asset

Recall the example whereby National Irish Bank purchased government bonds from a pension fund company. Their balance sheet finished up as follows;

National Irish Bank's Balance Sheet	
Assets	Liabilities
Government Bonds €10,000	Pension Fund Company's Current Account €10,000

Now let's imagine National Irish Bank felt it wanted to reduce some liabilities. It could choose to sell an asset to the pension fund company. In this case the pension fund company would use the €10,000 in their account to pay for the government bond. The money would be 'taken out' of their account and National Irish Bank would no longer have this liability. Equally National Irish Bank would no longer own the government bond and so their assets would reduce by the amount of the bond also. The bank's balance sheet would return to its original form as shown below;

National Irish Bank's Balance Sheet	
Assets	Liabilities
€0	€0

The €10,000 no longer exists and excessive bank sales can be another reason why there can be less money during a recession.

6. Transferring money from one account to another

6.1 Within a Bank

So far we have shown how banks create the numbers that appear in our bank accounts. These numbers are referred to as 'bank credit', 'demand deposits' or 'bank deposits' and for all intents and purposes these numbers are money. Now let's follow this money as Joe spends it in a number of ways.

In the example above Joe borrowed €10,000 in order to buy a car. Once the loan was granted, AIB's balance sheet appeared as follows:

AIB's Balance Sheet	
Assets	Liabilities
Joe's Debt	Joe's Current Account
€10,000	€10,000

In order to purchase a car, Joe must transfer the money from his account at AIB to the car dealer's bank account. If the car dealer also banks at AIB it is a very simple process for Joe to transfer the money. Joe simply instructs his bank to make a payment of €10,000 from his bank account to the dealer's account. AIB then deducts €10,000 from Joe's account, and adds it to the dealer's account.

AIB's Balance Sheet	
Assets	Liabilities
Joe's Debt	Joe's Current Account
€10,000	€0
	Car Dealer's Current Account
	€10,000

However if Joe and the car dealership bank with different banks the transactions will have to be settled using cash or central bank reserves.

6.2 Through Cash Transfer

If Joe and the dealer bank with different banks Joe could withdraw €10,000 in cash and pay at the dealership in person.

In the sample balance sheets below, we've hidden everything that isn't relevant to the transaction in question. But of course, AIB doesn't only have one loan, or one customer. There will be many other assets and liabilities recorded on their balance sheet. We're going to leave most of these items hidden for now, to keep things simple, but for the next transaction, we're going to show the cash that AIB got from the Central Bank of Ireland in the earlier example.

We'll also reveal the shareholder equity that was there from the beginning just so the balance sheets balance.

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

AIB's balance sheet just after it has granted the €10,000 loan to Joe appears as follows:

AIB's Balance Sheet	
Assets	Liabilities
Joe's Debt €10,000	Joe's Current Account €10,000
Cash €10,000	Shareholder's Equity €10,000

Joe then withdraws the €10,000 in cash from his bank account:

AIB's Balance Sheet	
Assets	Liabilities
Joe's Debt €10,000	Joe's Current Account €0
Cash €0	Shareholder's Equity €10,000

At this point, the bank has honoured its liability to Joe by repaying him in cash. Joe's account balance of €0 shows that the bank no longer has a liability to him.

He uses the €10,000 cash to pay the dealership, who banks with Permanent TSB. Prior to the dealer placing the €10,000 in their bank account, Permanent TSB's balance sheet looks like this:

Permanent TSB's Balance Sheet	
Assets	Liabilities
€0	Car Dealer's Current Account €0

When the car dealer deposits the money in their bank account Permanent TSB adds €10,000 to their cash reserves as they now own this cash. They increase their liabilities to the dealer by €10,000:

Permanent TSB's Balance Sheet	
Assets	Liabilities
Cash	Car Dealer's Current Account
€10,000	€10,000

6.3 Transferring Money Through Central Bank Reserves

Payments for large amounts of money tend to be made electronically using central bank reserves.

In the same way that you or I may have a bank account with a commercial bank, commercial banks have bank accounts at the central bank, known as reserve accounts. Reserve accounts hold the second type of money, i.e. central bank reserves. So if Joe and the dealership bank with different banks, the payment could be made by electronic transfer using these reserves.

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

AIB's balance sheet just after it has granted the €10,000 loan to Joe appears as follows:

AIB's Balance Sheet	
Assets	Liabilities
Joe's Debt	Joe's Current Account
€10,000	€10,000
Cash	Shareholder's Equity
€10,000	€10,000

Meanwhile Permanent TSB's Balance sheet looks like:

Permanent TSB's Balance Sheet	
Assets	Liabilities
	Car Dealer's Current Account
€0	€0

Joe then instructs AIB to make a payment of €10,000 to the dealer's bank account. Upon receiving this instruction, AIB reduces the balance of Joe's account, and transfers the reserves to Permanent TSB, hence AIB's balance sheet appears as follows:

AIB's Balance Sheet	
Assets	Liabilities
Joe's Debt	Joe's Current Account
€10,000	€0
Central Bank Reserves	Shareholder's Equity
€0	€10,000

Upon receiving the transfer of central bank reserves, Permanent TSB credits the car dealer's account with €10,000, completing the transaction:

Permanent TSB's Balance Sheet	
Assets	Liabilities
Central Bank Reserves	Car Dealer's Current Account
€10,000	€10,000

Let's look at the same transfer of reserves from the perspective of the Central Bank of Ireland's balance sheet. With both banks banking at the Central Bank of Ireland, transferring

reserves between reserve accounts is similar to when two individuals at the same bank make a payment to each other; a liability to one customer becomes a liability to another customer.

However, while reserves appear as an asset on the balance sheet of commercial banks, they are a liability of the central bank. In theory, before the payment is made from AIB to Bank of Ireland, the reserve accounts appear as follows:

Central Bank of Ireland's Balance Sheet	
Assets	Liabilities
Government Bonds €10,000	AIB's Reserve Account €10,000
	Permanent TSB's Reserve Account €0

Joe then instructs AIB to transfer €10,000 from his bank account to the dealer's account at Bank of Ireland. To do so, AIB will contact the Central Bank of Ireland (electronically), asking them to transfer €10,000 from its reserve account to Bank of Ireland bank account:

Central Bank of Ireland's Balance Sheet	
Assets	Liabilities
Government Bonds €10,000	AIB's Reserve Account €0
	Permanent TSB's Reserve Account €10,000

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

6.4 The Interbank Clearing System and TARGET2

Of course the two banks don't transfer reserves for each individual interbank transaction. The banks wait to the end of the working day and if €20,000 is transferred in one direction and

€19,000 is transferred in the other, the banks exchange the net of €1,000 in central bank reserves between them and this allows banks to have only a fraction of the reserves that would otherwise be required for interbank payments.

For payments across the Eurozone the Trans-European Automated Real-Time Gross-Settlement Express Transfer (Target 2) system is used to transfer central bank reserves between the national central banks. If Joe were to transfer the €10,000 from his bank account to someone who has an account with a branch of BNP Parabis in France the two banks would decrease and increase the customer's accounts accordingly and then settle the payment through TARGET2.

From AIB's point of view it would lose a liability since Joe's account reads zero but would also lose an asset because it would see that €10,000 of central bank reserves were 'gone'. From the Central Bank of Ireland's point of view they would no longer owe these reserves to AIB but would instead owe the ECB €10,000 who in turn owe the French central bank, Banque de France and would have a balance sheet as follows;

Central Bank of Ireland's Balance Sheet	
Assets	Liabilities
Government Bonds €10,000	AIB's Reserve Account €0
Intra Euro System Balance (What the ECB owes the CBI) €0	Intra Euro System Balance (What the CBI owes the ECB) €10,000

The ECB's Balance Sheet would look as follows:

European Central Bank's Balance Sheet	
Assets	Liabilities
CBI's Intra Euro System Balance (What the CBI owes the ECB)	BdF's Intra Euro System Balance (What the ECB owes BdF)
€10,000	€10,000

Finally, Banque de France's balance sheet would finish as follows:

Banque de France's Balance Sheet	
Assets	Liabilities
Intra Euro System Balance (What the ECB owes BdF)	BNP Paribas' Reserve Account
€10,000	€10,000

Note that the Central Bank of Ireland does not have to 'repay' the ECB nor does the ECB have to repay Banque de France. These Intra-Eurosystem Balances between the national central banks and the ECB are not physically settled at any point partially due to their continuous nature. They effectively record the flow of money between between the Eurozone countries.¹² It is also worth noting that the commercial banks can transfer money between each other in real time. However TARGET 2 balances don't update after each individual transaction. Instead they are updated periodically by the ECB.¹³

Conclusion;

- What we now use as money, the numbers in our bank accounts, are simply accounting entries / bank liabilities. These accounting entries make up over 97% of all the money in the Eurozone today and 94% of the money in Ireland.
- We now use these bank liabilities / accounting entries to make payments for over 99% of all transactions by value. Hence the ability to print cash is of little benefit for the Department of Finance.
- Banks create/delete these numbers and hence the vast majority of the nation's money supply.
- Banks create money usually through advancing loans. Hence almost every Euro has a corresponding debt to the banking sector.
- Banks also create money when they purchase an asset.
- Once a loan is repaid to a bank the money used to do so no longer exists and this is why there can be less money in circulation.
- When banks sell an asset the money the buyer had no longer exists also.
- The repayable principal of the loan is recorded as an asset. However, the interest payable isn't recorded as an asset on the balance sheet but is recorded as a profit due to the shareholders as and when the interest is paid.
- The money that banks use to pay each other, central bank reserves, are themselves created as accounting entries by the national central banks. The liability that the Central Bank of Ireland creates for the commercial banks is balanced by the asset that the bank posts as collateral, which could be the bank's promise to repay its debt.

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