International Money and Banking: 3. Central Banks

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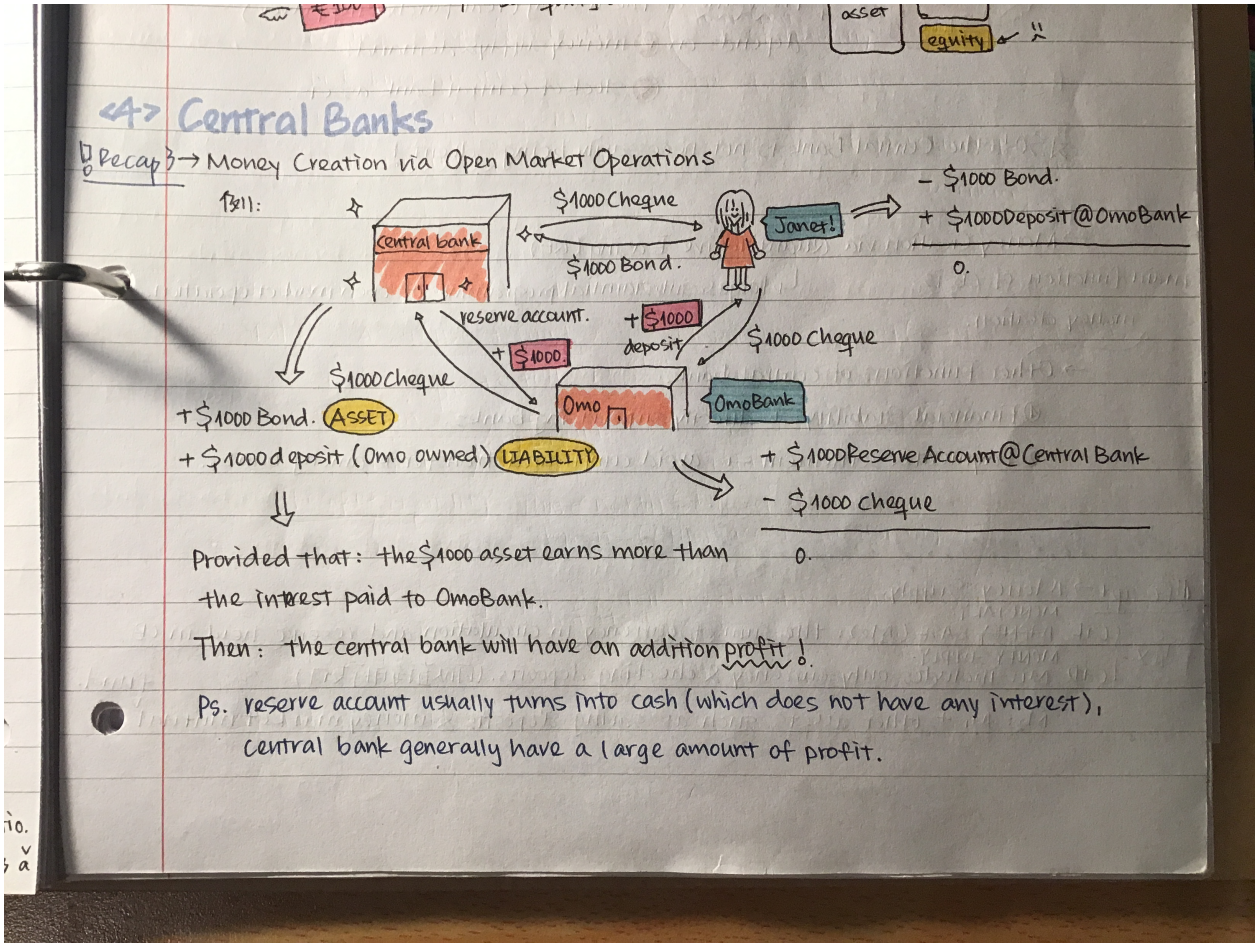
Introducing Central Banks

- In the earliest monetary systems, governments directly issuing coins or notes and used the proceeds to pay for government spending. This is not how money is created in modern advanced economies.
- Instead, money is created by central banks.
- Central banks play the role of the "clearinghouse banks" that we discussed before. Banks keep accounts at the "central bank" and use these accounts to settle payments with other banks.
- Today, all banks must keep what are known as "reserve" accounts with their central bank and there are rules requiring banks to keep a certain amount of funds in these reserve account ("reserve requirements"). It is through adjustments to these accounts that money is created in modern economies.
- Though they operate separately from government finance or treasury departments, central banks are public bodies and they generally return the profits from their operations to the fiscal authorities.
- Governments also keep their own account at the central bank, depositing tax revenue and paying their bills from this account.

Money Creation via Open Market Operations

- Where does the cash in your pocket come from? Milton Friedman used a "helicopter drop" of cash as a simple analogy for central bank money creation.
- Since helicopter drops are not practical or fair, in practice, central banks create money via methods such as **open market operations**:
  1. The central bank purchases a security (e.g. a bond) worth \$1000 from Janet by giving her a cheque for \$1000.
  2. Janet then deposits the cheque at her bank, call it OmoBank.
  3. When OmoBank presents the cheque for payment to the central bank, the central bank credits OmoBank's reserve account by \$1000.
  4. OmoBank can, if they wish, swap these additional reserves for cash to put in ATM machines. When OmoBank orders a delivery of cash from the central bank, its reserve account is reduced by that amount.
- Where does the central bank get the money from to increase OmoBank's reserve account? Nowhere! This is the central bank "creating" money.
- Note that the actual printing of cash in this example is driven by the demand from bank customers via removing money from ATM machines.

A Recent Student's Graph of the Open Market Operation Process



Implications of Open Market Operations

- **Janet**: Note that when the Fed created money via the open market operation, Janet was not better off: Janet sold a bond worth \$1000 and received a credit to their deposit account worth \$1000.
- **OmoBank** are not better off. They have increased assets of \$1000 in the form of additional money in a reserve account with the central bank but they also have an additional liability in the form of an \$1000 in deposits owed to Janet.
- **Central Bank**: The central bank has a new asset worth \$1000 while it has an additional \$1000 in reserves that are owned by Omobank. Provided the new asset earns more interest than the central bank pays to OmoBank, then the central bank will have an additional flow of profits and will be able to transfer some of these profits back to central government.
- In practice, central bank assets generally earn more than they pay out to banks in the form of interest payments on reserves. And since reserves are often turned into currency (which does not earn any interest) central banks generally make large amounts of profit.

Money Creation via Loans to Banks

- Open market operations via bond purchases have been the key tool for money creation used in recent years by some of the world's most important central banks.
- Another way to create money is for a central bank to make loans to banks.
- For example the Eurosystem of central banks (meaning the ECB and the national central banks) provides a large quantity of loans to the Euro-area banks at a specified rate. The rate of interest on these loans has traditionally been the ECB's key policy rate. I will provide a lot more information on these lending operations later.
- As a condition for obtaining such loans, banks must pledge some assets to the ECB as **collateral**. This means that if the bank fails to repay the ECB, the central bank will take the collateral in lieu of repayment of the loan.
- As with open market operations, central banks provide loans to banks by crediting their reserve accounts, creating money from nowhere.

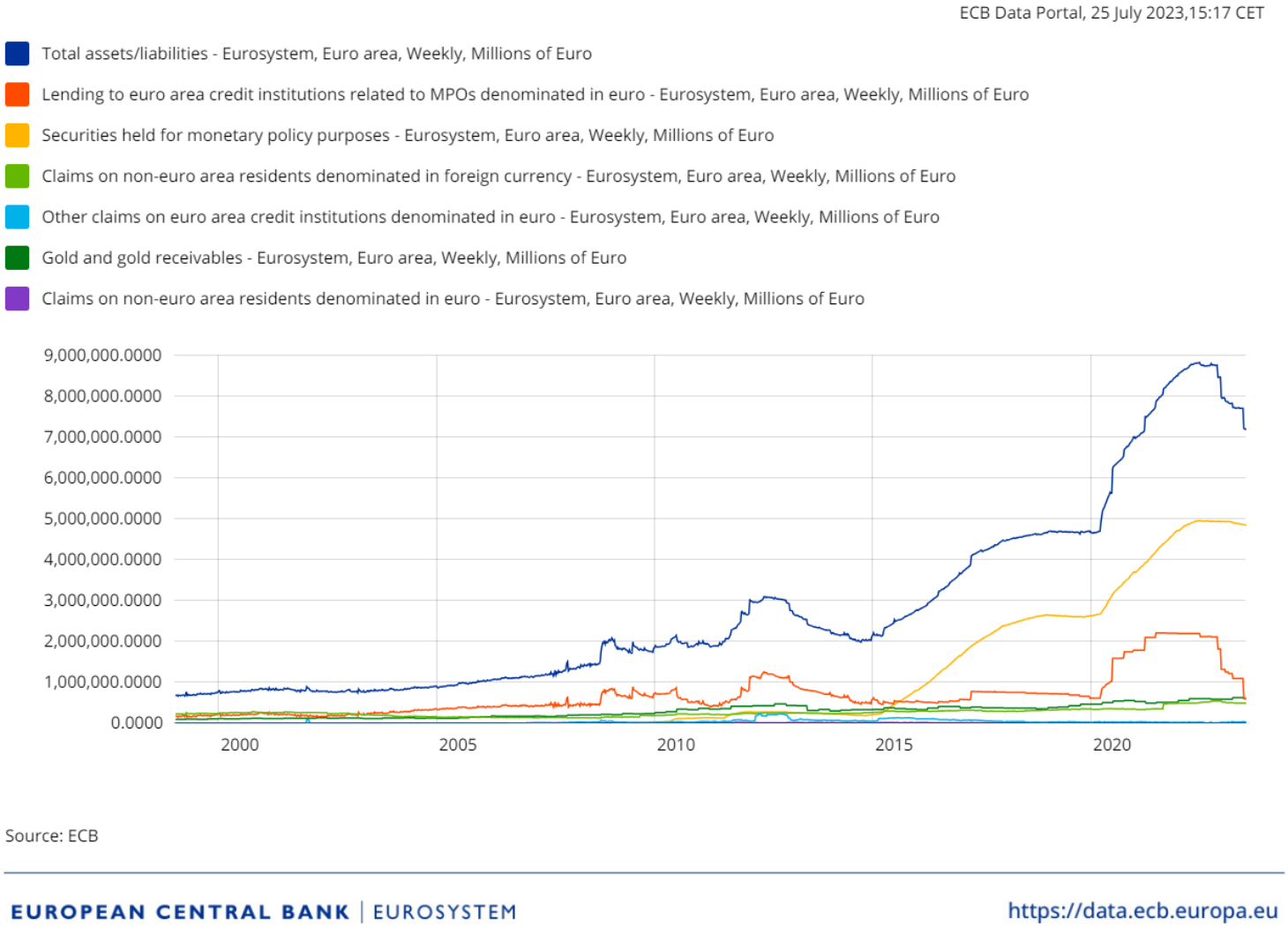
Central Bank Balance Sheets

- Due to their money creating activities, central banks build up large stocks of assets over time.
- Depending on how much of the revenue stream from these assets has been passed over to governments over time, the current value of a central bank's assets may exceed the amount of money they have created in the past when acquiring these assets.
- Central banks release a "balance sheet" to summarise the assets they own and the money they have issued.
- In a stylised example, such as the one below, assets are shown on the left-hand side while the right-hand side lists the amount of money that has been created as "Liabilities". The difference between the current value of assets and liabilities is labelled "Capital".

Assets	**Liabilities and Capital**
Securities	Money Created
Loans	Capital

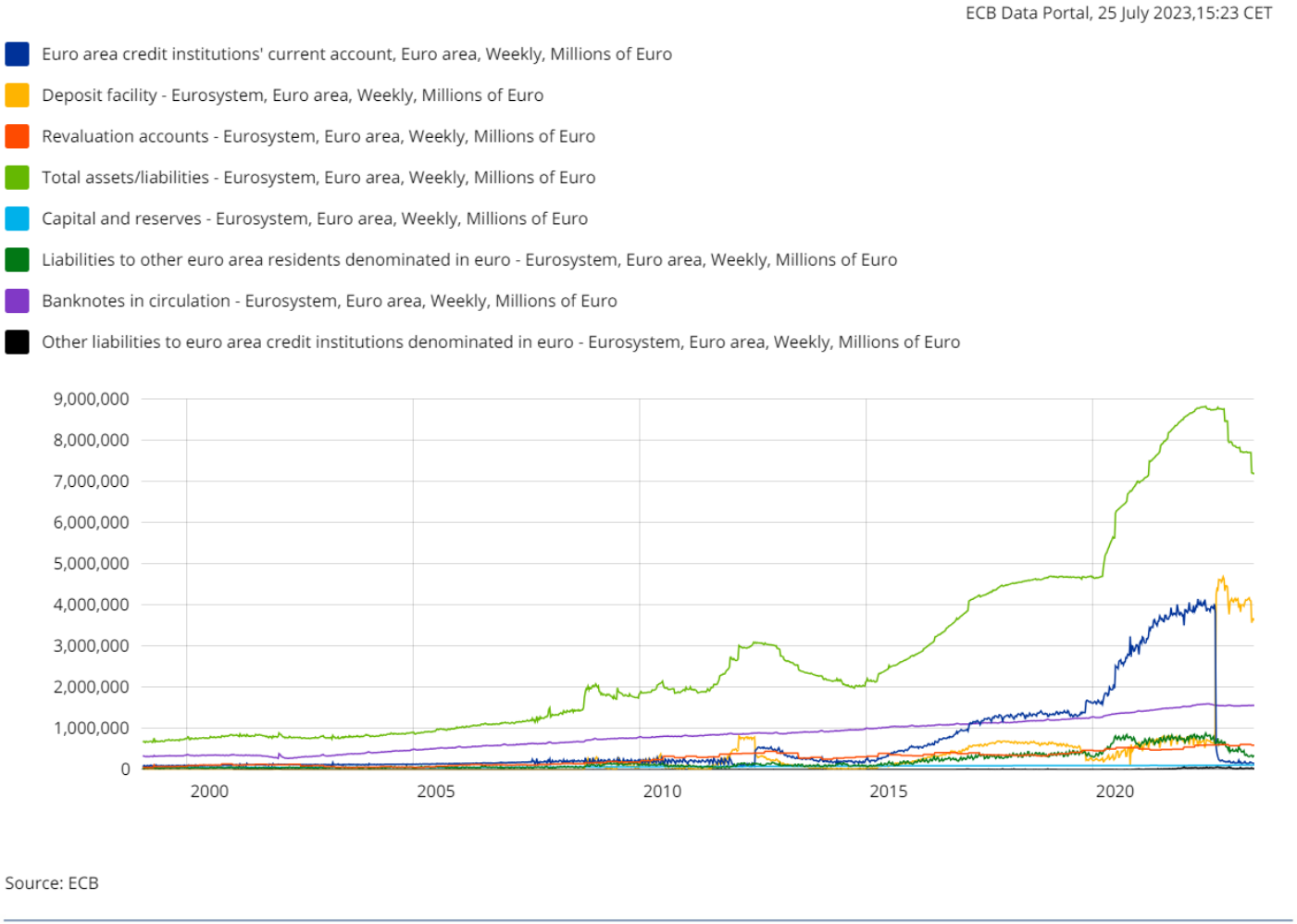
The Eurosystem's Balance Sheet: Assets

The ECB reports the combined consolidated balance sheet of the ECB and all the national central banks each week. Here's an example of what it looks like.



The Eurosystem's Balance Sheet: Liabilities

The ECB reports the combined consolidated balance sheet of the ECB and all the national central banks each week. Here's an example of what it looks like



Reserve Accounts in Practice

- Macroeconomics textbooks refer to the deposits that banks keep at the central bank as "reserve accounts" but in their published accounts, actual central banks don't usually call them that.
- You can see from the Eurosystem's accounts, that what I have called "reserves" is labelled "liabilities to euro area credit institutions."
- In what sense are these "liabilities"? They can be considered liabilities because the Eurosystem has a policy of compensating banks by paying interest to them on these deposits.
- In general, however, the interest rate central banks pay on reserves is a low one. It is almost always lower than the average interest rate on the central bank's assets. This means central banks generally make profits.
- To give a concrete example, the interest rate the Eurosystem earns on loans it provides to banks is higher than the interest rate it pays them on their reserves.
- For a number of years recently, the Eurosystem had a negative interest rate for reserves, meaning banks had to pay the Eurosystem to keep money on deposit with them!

Do Central Banks Need To Be "Solvent"?

- It is natural to look at any balance sheet in which one side is labelled "Assets" and assume that most of what's on the other side is "Liabilities".
- Central bank balance sheets list the money they have created as "Liabilities." But you need to be careful interpreting these balance sheets.
- When a central bank operates a non-fiat currency (e.g. the Gold Standard) it agrees to have sufficient "hard assets" of a particular type so that it can swap its currency for the hard assets at the agreed conversion rate.
- In contrast, in modern fiat currency system, there is no promise to redeem notes for any particular amount of gold or other assets. These "liabilities" are essentially notional.
- In a fiat currency system, a central bank's asset holdings could fall below the value of the money it has issued (i.e. the balance sheet could show it to be "insolvent") without affecting the value of the currency in circulation. A fiat currency's value—determined by the price level (how much can you buy with a euro)—is not determined by the stock of central bank assets.
- See my blog post "Is the ECB Risking Insolvency? Does it Matter?"

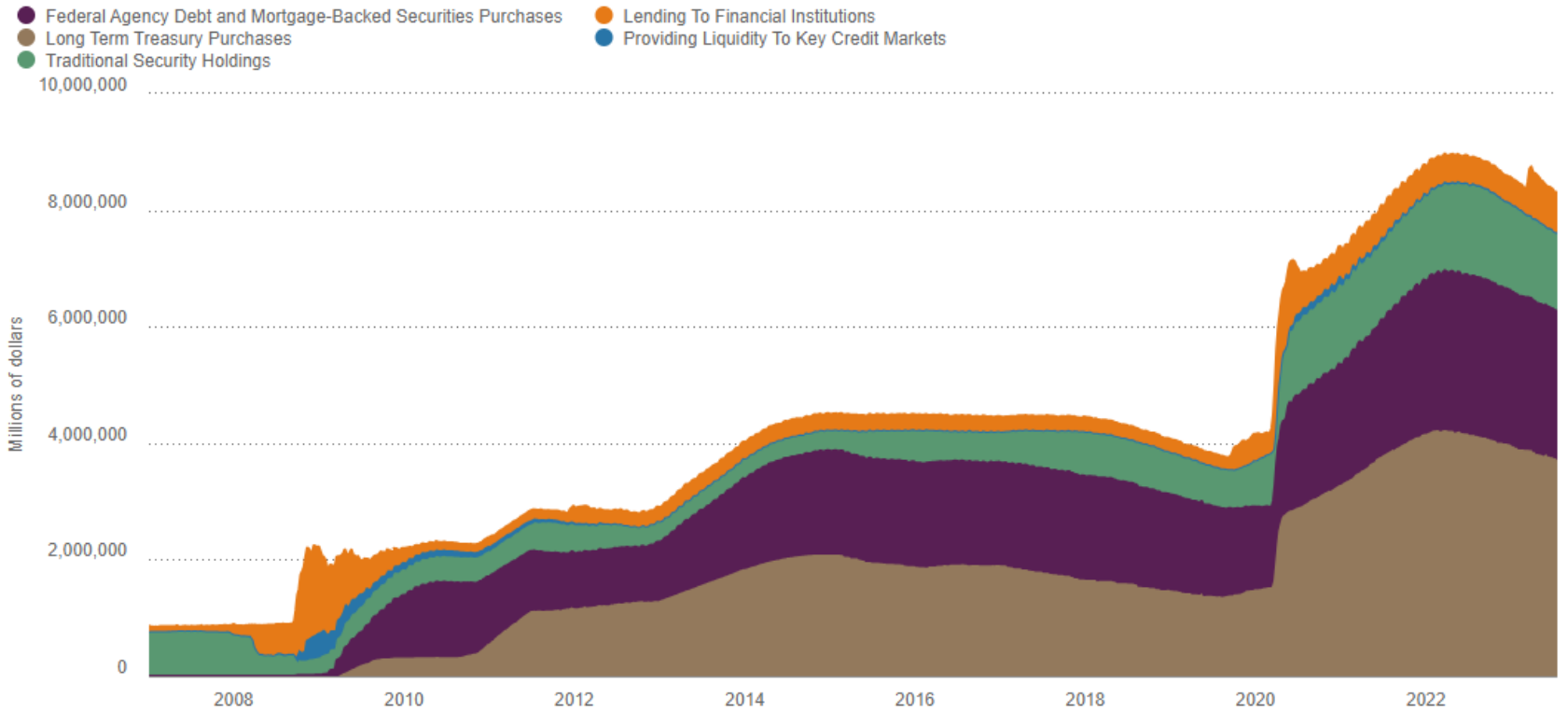
Reasons for Risk Control at Central Banks

- So it's not important that a central bank's balance sheet shows that its assets exceed liabilities.
- And central banks generally make profits: They earn interest on their assets while much of what is counted as their "liabilities" (cash) earns no interest and other liabilities (deposits/reserves) earns a lower rate of interest than their assets. So concerns about solvency are largely theoretical.
  1. **Opportunity Cost**: Instead of acquiring a particular asset, the money could have been used to buy an asset which gave the central bank a return and this return could have been passed back to central government.
  2. **Indirect Cost**: Because expansions in the supply of money can produce inflation, printing money can create an indirect cost by making goods and services more expensive. For these reasons, it is important that central banks have proper risk control procedures aimed at securing a fair return on the assets acquired via money creation.

Money Creation via Quantitative Easing

- Since 2009, the Federal Reserve, the Bank of England and the Eurosystem have, at various times, engaged in programmes of large-scale asset purchases, known as **Quantitative Easing (QE)**.
- Forget the fancy name for now, these are just very large and sustained programmes of open market operations. Don't worry for now about why central banks did this—we will discuss that later.
- The charts on the next page shows changes over time in the assets owned by the Federal Reserve and Eurosystem.
- The big changes in the size of the balance sheets of the Fed and the Eurosystem mainly reflect the QE programmes that were undertaken at various times since 2009.
- The Eurosystem's balance sheet has substantially expanded since 2008. This has reflected large fluctuations in the amount of loans provided to banks as well as two rounds of QE: The "Asset Purchase Programme" first started in 2015 and the "Pandemic Emergency Purchase Programme" started in 2020.

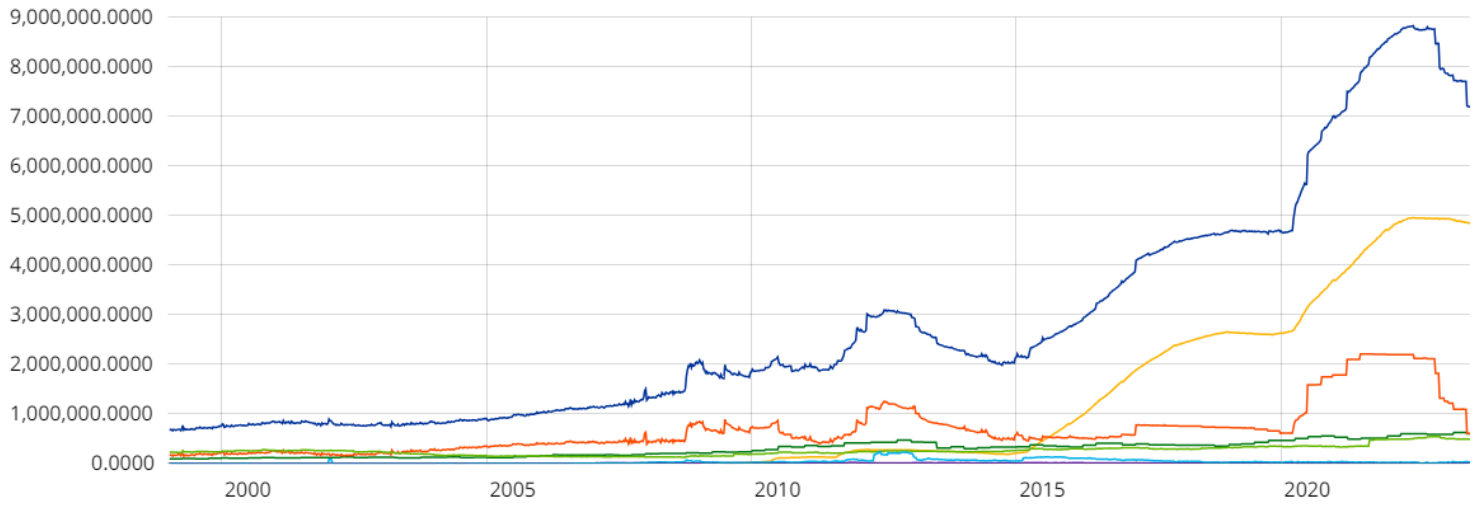
The Fed's Assets



The Eurosystem's Assets (Millions of Euro)

ECB Data Portal, 25 July 2023,15:17 CET

- Total assets/liabilities - Eurosystem, Euro area, Weekly, Millions of Euro
- Lending to euro area credit institutions related to MPOs denominated in euro - Eurosystem, Euro area, Weekly, Millions of Euro
- Securities held for monetary policy purposes - Eurosystem, Euro area, Weekly, Millions of Euro
- Claims on non-euro area residents denominated in foreign currency - Eurosystem, Euro area, Weekly, Millions of Euro
- Other claims on euro area credit institutions denominated in euro - Eurosystem, Euro area, Weekly, Millions of Euro
- Gold and gold receivables - Eurosystem, Euro area, Weekly, Millions of Euro
- Claims on non-euro area residents denominated in euro - Eurosystem, Euro area, Weekly, Millions of Euro



Source: ECB

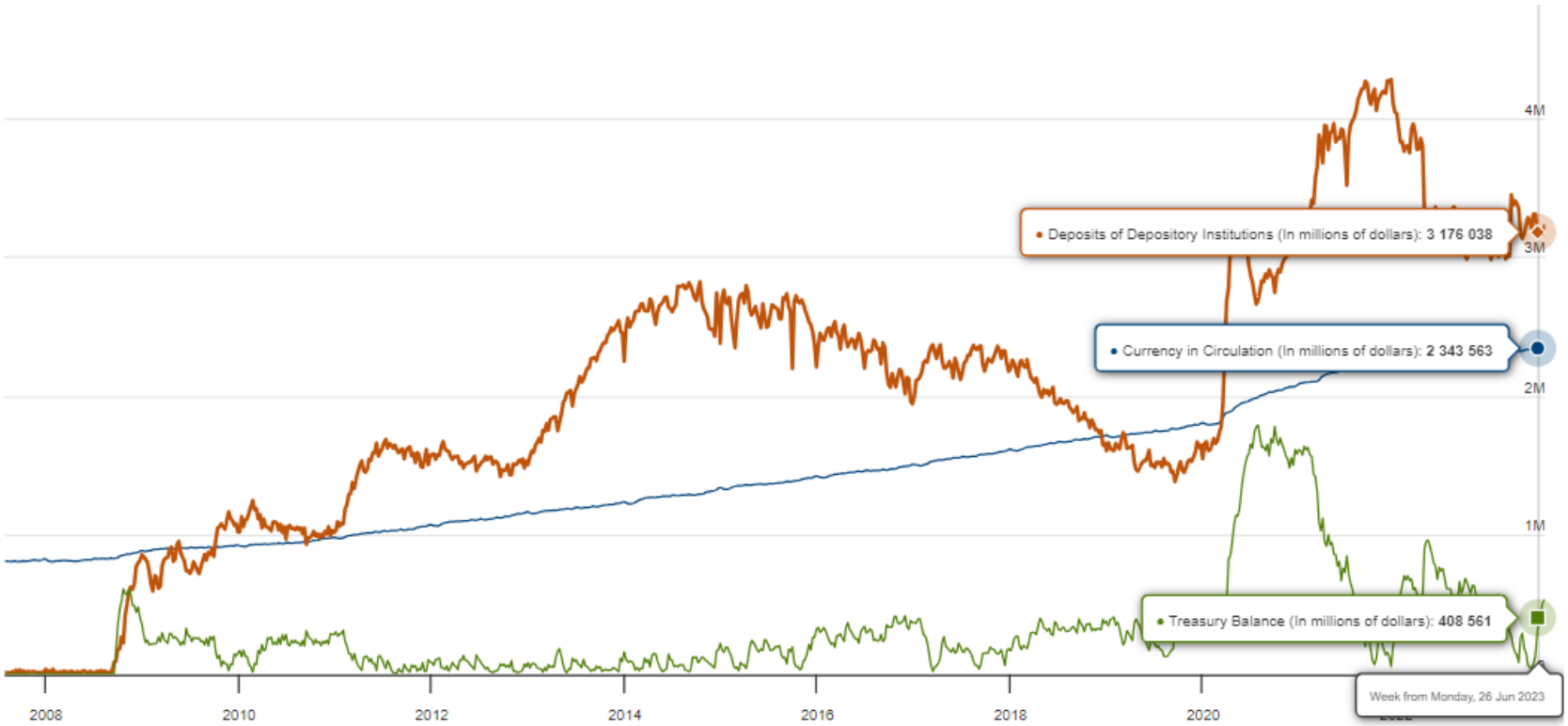
EUROPEAN CENTRAL BANK | EUROSYSTEM

https://data.ecb.europa.eu

How Do Central Banks Pay for QE?

- The chart on the next page illustrates how central banks paid for these asset purchases. Accompanying the Fed's QE programme, there was a huge increase in the amount held in reserve accounts (denoted as "deposits of depository institutions" by the Fed).
- These occurred because these purchased were carried out as open market operations: The central banks bought securities from the private sector and paid for them by crediting the reserve account of the sellers' banks.
- For the Fed, there has been a big increase in both reserve accounts of commercial banks. In 2020, the "Treasury balance" (the money the Treasury keeps on deposit at the Fed) increased a lot. It then fell in 2021.
- This might look like the Fed bought bonds directly from the Federal government and paid by crediting their account. However, that is not the case.
- Instead, what happened was the Federal government has borrowed huge amounts from the private sector and deposited it at the Fed. By borrowing money from the private sector, they stopped commercial bank reserves rising in 2020 by as much as they would have otherwise. They then spent it to fund the budget deficit.

How the Fed Created Money via QE



Monetary Policy

- Open market operations are an example of what is known as **monetary policy**.
- In many textbook treatments of macroeconomics, the focus of the central bank's monetary policy is to control the amount of money that it issues, whether as cash or in the form of bank reserves.
- QE is an example of such a policy. Implementation of QE could be considered an downward shift in the LM curve in the classic IS-LM model.
- Over recent decades, however, the focus of central banks has generally not been on controlling the supply of money. Instead, central banks have used their money creation powers to influence the interest rates that people can borrow at.
- Later, we will provide a detailed discussion of why interest rates (rather than the supply of money) have been the key focus of monetary policy and we will discuss in detail how central banks influence interest rates.

Lender of Last Resort

- We have discussed how banks can get into trouble if depositors or other providers of funds withdraw money quickly.
- If the bank does not have sufficient liquid assets to cope with these withdrawals, and other banks are not willing to lend to it, what can it do?
- One option would be to get a loan from the government. This could take the form of a loan from central government but, in practice, it is central banks that have taken on this **Lender of Last Resort** role.
- There are a few reasons why governments prefer to have central banks take on this role.
  1. Central banks can create money "with the push of a button" and supply it a bank by crediting its reserve account.
  2. Central banks can provide the money with more secrecy. Governments would likely have to debate and pass legislation if the loans came from central government.
  3. Central bank loans don't get counted as government spending.
- Because of their lender of last resort role, central banks are often given explicit mandates to maintain the stability of the financial system.

Banking Supervision

- Later we will go into more detail about the types of regulations that banks must obey. It is important, however, to distinguish between **banking regulation** (the rules) and **banking supervision**: The latter is the process of checking that banks are complying with the rules. Supervisors can also assess a bank's corporate governance and risk-taking culture. In extreme cases, supervisors can cancel a bank's license to operate.
- There have been debates over the years about whether central banks should be involved in directly supervising banks.
- Some believe there could be conflicts of interest between supervisory objectives and monetary policy objectives such as price stability.
- I do not agree with those arguments. I believe that involvement in banking supervision can be helpful to meeting monetary policy objectives and also makes the central bank's lender of last resort policy function more efficient. See my paper "Should Monetary Policy be Separated From Banking Supervision?" for a discussion of these issues.
- In the euro area, the ECB took over as the single supervisory mechanism (SSM) for all banks in 2015.

Payments & Settlement

- Because all banks maintain reserve accounts with their central bank, this puts the central banks at the very centre of the banking system.
- This gives them an advantage over other institutions in facilitating payments between banks: If Bank A wants to send money to Bank B, the easiest way to do this is for Bank A to ask the central bank to deduct from its reserve account and to add money to Bank B's reserve account.
- Central banks have developed complex payments and settlement systems, based on sophisticated IT platforms, to make these transfers between banks with minimal delays.
  - In 2022, the Fed's *Fedwire* system handled 784,209 transfers per day with an average total daily value of $4.2 trillion.
  - In 2022, the Euro area's *TARGET2* system processed a daily average of 399,213 transfers, with an average total value of €2.2 trillion.
- These systems ensure that your direct debit payments don't bounce and that your credit or debit cards are accepted for payment. Operating and improving these systems is an important part of central banking.

Key Points

1. What are reserve accounts and reserve requirements.
2. Details of the Eurosystem's reserve requirements.
3. How central banks create money via open market operations or loans to banks.
4. How to describe a central bank's balance sheet.
5. Do central banks need to have assets exceeding liabilities?
6. Reasons for risk control in managing central bank assets.
7. How the Fed and Eurosystem implemented Quantitative Easing programmes.
8. Why central banks are usually given a mandate to maintain financial stability.
9. Why central banks are involved in banking supervision.
10. Why central banks play an important role in payments systems.