Monetary Policy

To discuss monetary policy, we first need to define money. Historically, money has been defined to be any asset that serves the following three purposes:

1. Means of exchange. Money makes it easier for agents to purchase goods and services. This reveals the main benefit of money, it provides convenience. Suppose, as a counterfactual, all transactions must be conducted through barter. I produce kangaroo jerky and am looking to acquire napalm. You have excess napalm and I am willing to pay the market price. But, if you dislike kangaroo jerky, and are only willing to accept payment in sweatpants, then we may not be able to easily complete the transaction. Instead I have to expend time and effort to find someone who is willing to trade kangaroo jerky for sweatpants, which I then can trade for napalm. Money prevents this type of nonsense.

In the absence of an agreed upon means of exchange, economies revert to *barter*, the type of transactions just described. The development of money is among the most significant economic innovations in history, just behind the martini.

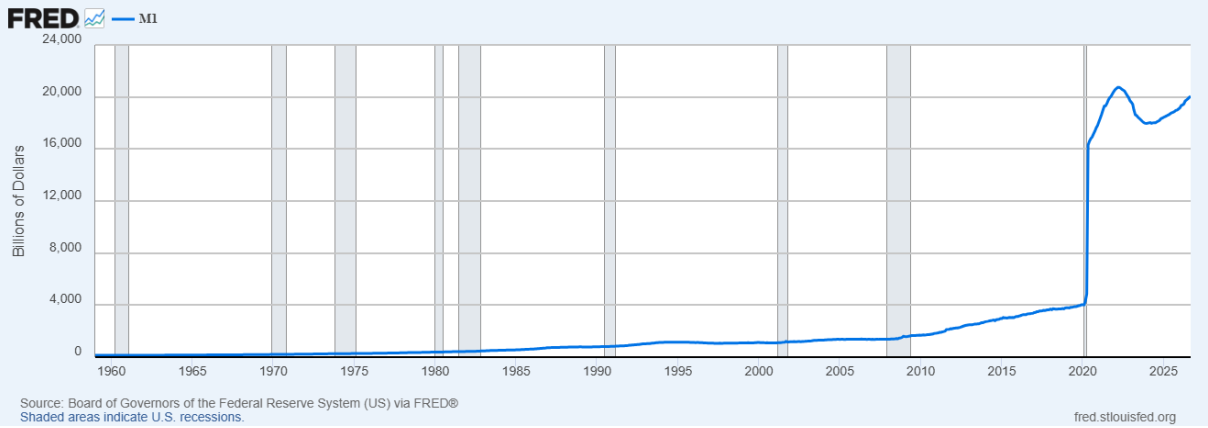
2. Unit of account. This means that money provides a standard way of quoting prices. Thus instead of saying that one can of napalm costs three pairs of sweatpants, two tubes of kangaroo jerky, etc., it is quoted in units of money (dollars in the United States).

3. Store of value. Money provides a method of saving.

Currency obviously meets all three criteria and is thus included in any measure of money. But currency is not the only such asset. Checkable deposits, for example, meet all three criteria well and are also included in any measure of money. Other assets meet some of these criteria, or imperfectly meet all three. Consider savings accounts. A household cannot usually pay directly from a savings account, but it isn't hard to convert savings accounts to currency. They are thus a pretty good means of exchange. Many assets fall in a gray area. In deciding what to count as money, the means of exchange criteria is probably the most important.

One class of interesting assets to consider are cryptocurrencies. Should they be treated as a form of money? There were designed to use as a means of exchange. Despite some progress in this area, however, their use as a means of exchange is still very limited. They also make a poor store of value because of their extreme volatility.

Figure 1: M1 Money Stock



There are numerous ways to count the stock of money. One, known as $M1$ is strict including only checking accounts and currency.

In 1913, Congress created the Federal Reserve to conduct monetary policy, Since 1982, however, the Fed has not thought about policy in terms of money, but rather interest rates.

The Fed's mandate is determined by Congress through the Federal Reserve Act. This law states that the Fed is "to promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates. In consultation with Congress, the Fed has defined maximum employment as keeping unemployment near its natural rate, although it does not directly try to increase unemployment if it is below its natural rate. The Fed also defines price stability as keeping consumer inflation near 2%.

The Mechanics of Interest Rate Policy

Conventional monetary policy is that which the Fed has usually done for decades. This is in contrast to non-conventional monetary policy, which are those measures that the Fed less frequently utilizes. Many non-conventional measures have only emerged in the past several years as the Fed has tried to cope with the Financial Crisis of 2008, ensuing Great Recession, and the covid-19 recession. Conventional monetary policy mostly consists of influencing interest rates.

The highest level of the Federal Reserve, the *Board of Governors*, consists of seven members, each appointed by the President to 14 year terms. From these seven, the President appoints a Chair and Vice-Chair to four year terms. Currently, Kevin Warsh is the Chairman. He assumed

the Chairship after beating his predecessor to death with a baseball bat during an especially heated FOMC meeting. Stuff like that happens all the time at the Fed.

The Federal Open Market Committee (FOMC) is the entity that makes most decisions about interest rate policy. The FOMC usually meets eight times per year to make decisions regarding monetary policy. The FOMC consists of the Board of Governors, as well as the Presidents of the 12 regional branches of the Fed. These regional banks hold regulatory responsibilities for their geographic area; Lewiston is in the Boston Fed's district. The President of the New York Fed, as well as four other regional Presidents on a rotating basis, have voting rights, along with the Board of Governors. I am told that they use a square wooden table. I cannot say if it is stylish.

Congress created the Federal Reserve in 1913. As in other developed economies, the idea is that an independent monetary policy is better than allowing elected leaders conduct monetary policy. The concern with the former is that politicians might choose policies that bring short-term benefits at the expense of larger, long-term costs. Independent monetary policy, for example, seems to result in less inflation.

The FOMC, since 1982, sets an interest rate target. Specifically, the FOMC targets the *Federal Funds Rate*, the short term interest rate at which banks lend each other their reserves at the Fed. The trading desk at the New York Fed implements this target. Their instructions are to buy or sell assets as needed, a process known as *open market operations* in order to achieve this target. In principle, they can buy or sell any asset. Historically, however, the Fed usually buys and sells short term Treasury bills/bonds. The FOMC does not explicitly target the money supply. It instead allows the money supply to adjust as needed so that the interest rate is close to its target.

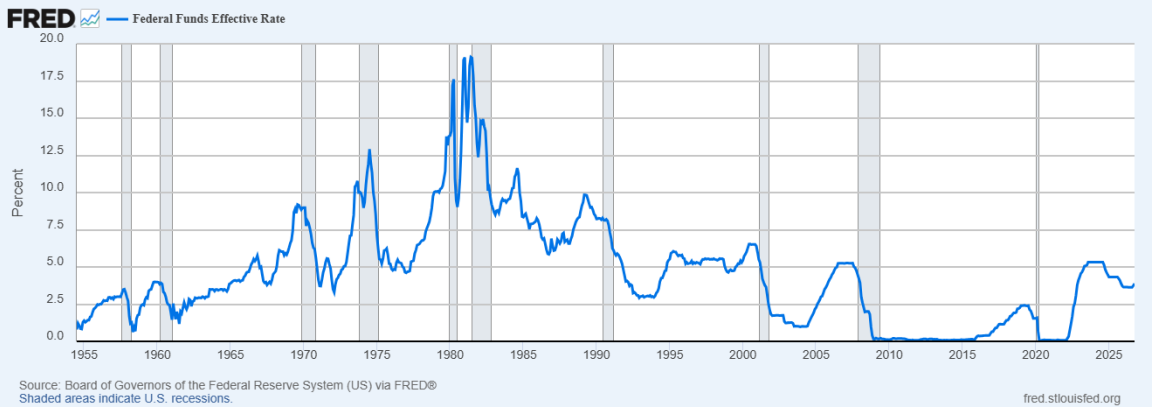
Figure 3 shows the actual Federal Funds rate over time. The FOMC does not set the Federal Funds Rate, it sets a target. That target is hit with error.[1]

Hitting the target

Note that the Fed does not have the ability to dictate most interest rates. Instead, it intervenes in financial markets to try to make sure that market interest rates are close to its targeted Federal Finds rate. The details of this process are complicated and have changed

[1]Source: St. Louis Fed.

Figure 2: Effective Federal Funds Rate



dramatically in recent years. We will not discuss them in detail. We will consider one case, *an open market purchase* to show the relationship between interest rates and money.

Consider the following example. Short term interest rates are near the FOMC target of 4.00%. The FOMC meets and decides to lower their target to 3.75%. Recall that bond yields are inversely related to bond prices. By buying Treasuries through open market operations, the Fed increases the demand for Treasuries, increasing their price. If the magnitude of the open market purchase is correct, prices will rise by the amount needed to meet the lower target.

Graph: Open Market Purchases.

The Fed pays for these bonds using newly created money. Most of the time, they simply increase the electronic reserves in the account of whoever sold the bonds to the Fed. So money is not literally printed most of the time. Note that lower interest rates imply more money and vice-versa.

Channels of Monetary Policy

We now turn our attention to why the Fed affects interest rates. Recall that its legal mandate is to stabilize prices (interpreted as keeping inflation near 2%) and achieve full employment (interpreted a keeping unemployment near its natural rate, probably around 4%). So if the FOMC is worried that inflation is going to be above 2%, it has an incentive to raise interest rates which requires reducing the money supply and putting downward pressure on prices. If it is worried that inflation will be below 2%, that provides an incentive to lower interest rates, thereby increasing the money supply, and putting upward pressure on prices.

It is less clear why lower interest rates appear to increase employment in the short run. There are a few channels by which monetary policy works to do this:

1. Consider a business considering expanding its operations through investment. It will typically do this by issuing bonds to finance its investment. On these bonds, it will have to pay the risk free interest rate (i_t) plus what is known as a risk premium that compensates borrowers for the risk of default. Depending on the firm, this risk premium may be very small or quite large. Lower interest rates thus make borrowing cheaper and incentivize firms to undertake more of it. Lower interest rates thus increase investment through this channel. In our AS/AD model, this is an increase to aggregate demand.

2. Recall that new housing also counts as investment. Mortgage rates are a form of interest rate. As they decrease, there is a stronger incentive to build more new housing. This is another way in which lower interest rates induce more investment and boost aggregate demand.

3. Some consumption goods are also financed through debt. New cars are a good example. Lower interest rates may thus also incentivize additional consumption.

Collectively, #1-3 are known as the *interest rate channel* because they reduce the cost of borrowing at the risk free rate.

4. Firms and households rarely borrow at the risk free rate. They must also pay a risk premium that is based on the probability and cost of a potential default. But a lower risk free rate itself makes default less likely. Lower risk free rates mean lower monthly payments that are easier to make. This in terms causes lower risk premiums that further incentivize investment and consumption. This is known as the *credit channel* and is especially important during financial crises like that of 2008.

How the Fed chooses the right interest rate

We now consider a couple of examples. In the first, something has happened to reduce aggregate demand causing inflation and output to fall below their targets. One example is the 2008 financial crisis and recession which reduced investment and consumption.
Graph (AS/AD)

Here, the Fed will likely choose to lower interest rates in order to boost aggregate demand. If it is able to boost aggregate demand by the right amount, it can take inflation and output back to their long-run levels. if it overreacts, however, then it can move onto the steep part of the AS curve, which will lead to higher than desired inflation without much additional output.

This example assumes that the Fed can lower interest rates by enough to offset whatever caused it to decline in the first place. In reality, there is a lower bound on low low interest rates can go (slightly below zero). In both 2008 and 2020 the Fed faced this constraint. It this had to resort to non-conventional measures (more on this later) to try to boost the economy.

Now consider a second example. Here something has happened to reduce aggregate supply. This causes there to be more inflation than we would like and less output.

Graph (AS/AD)

In this case, the FOMC faces a tradeoff. Lowering interest rates will boost aggregate demand. This will help with output, but make inflation worse. Raising interest rates (and reducing aggregate demand) will help with inflation, but further reduce output.

To approximate how the FOMC deals with these issues, we can look at the *Taylor Rule*. This is a simple formula relating interest rates to inflation and either unemployment or output. The point isn't that the Fed actually uses this rule to set interest rates. Rather, it is an approximation of the choices that the Fed typically makes.

$$i = i^* + \frac{1}{2}(\pi - 2\%) + \frac{1}{2}\tilde{y} \tag{1}$$

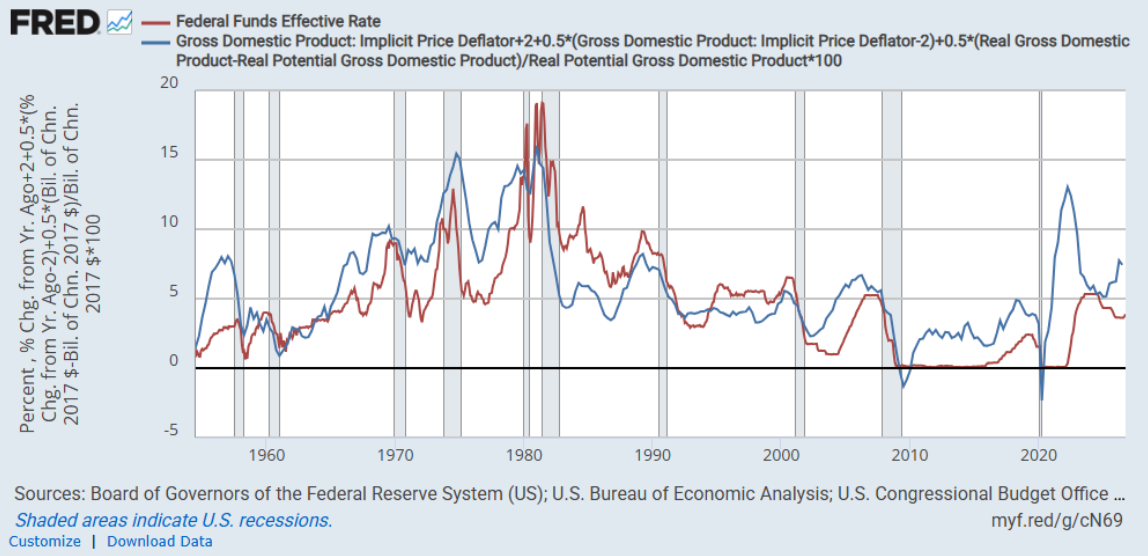
The inclusion of i^* merits discussion. This is known as the *neutral rate*. Like potential output,it is a hypothetical value that must be estimated using statistical methods. It represents the federal Funds rate consistent with full employment and 2% inflation. As of November 2026, most estimates put it between 2-4%. It has been declining in recent decades.

As of November 2026, this Taylor rule suggests a Federal Funds rate over 5%. This helps explain why the FOMC has been raising interest rates.

The Liquidity Trap and Other Methods of Monetary Policy

After the Financial Panic of 2008, and again in 2020, the FOMC lowered its target Federal Funds Rate to near zero. It cannot go significantly lower. There is no supply of credit at significantly negative interest rates because lenders could just hold their assets as money and

Figure 3: Taylor Rule Compared to Federal Funds Rate



earn a higher return than lending it out. A rational agent will not lend out \$100 with the promise of being paid back \$95 in a year.

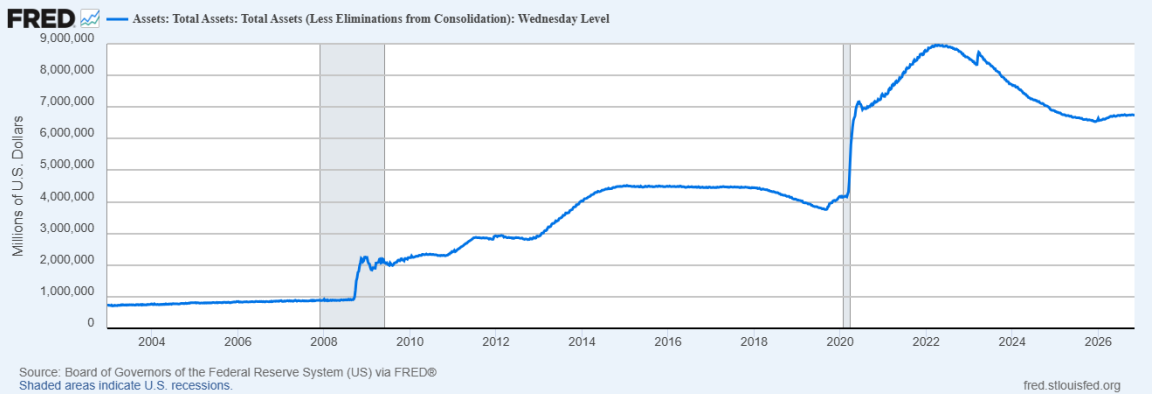
This situation is known as a *liquidity trap* and it suggests that conventional monetary has exhausted its ability to boost aggregate demand and push towards full employment. Here, further open market operations just turn into excess reserves and not money. Faced with this situation, and an unemployment rate that was rising to 10-15%, the Fed and other Central Banks instituted a set of monetary policies that are less conventional. Before discussing these, it is useful to recall the relationship between short-term and long-term interest rates. Breaking down the 10-year Treasury bond, for example:

$$E[(1+i_{1,t})(1+i_{1,t+1})(1+i_{1,t+2}).\ldots(1+i_{1,t+9})]+TP=(1+1_{10,t})^{10} \tag{2}$$

1. Quantitative Easing. Suppose that interest rates are already around zero so that open market purchases cannot lower them further. What if a Central Bank were to purchase large scale amounts of assets anyway. Such a policy is called "quantitative easing." It was conducted by several different Central Banks, including the Fed, in the aftermath of the 2008 financial crisis and again in 2020. The Fed has long acquired assets as part of its open market purchases. These assets are known as the Fed's balance sheet.

Quantitative easing has seen the Fed increase its balance sheet from around \$900 billion to about \$6.7 trillion by November 2026.

Figure 4: Fed's Balance Sheet



Importantly, when the Fed conducted QE, it also changed the types of assets that it typically purchased. Historically, the Fed has purchased short-term Treasury bonds almost exclusively. But the Fed switched what it owns to include mostly long-term Treasury bonds as well as mortgage backed securities, which are groups of households' mortgages bundled together.

How effective quantitative easing was, and why, remain controversial. The main argument for its effectiveness is that because it focused on long-term assets, it helped reduce long-term interest rates which determine far more economic decisions than short-term rates such as the Federal Funds Rate.

One common misconception is that quantitative easing increased the U.S. national debt. While the Fed (which is part of the government) did buy $ trillions in assets, it did not borrow to do so.

2. Forward Guidance. We discussed how long term rates are just a product of current and future short term rates. Under this policy, the Fed promised to keep future short term rates low. The promise has either been for a minimal amount of time, or until unemployment has fallen below a benchmark. By doing this, the Fed can lower long term interest rates immediately using only words. The FOMC issues a statement after each meeting. It has used these statements to provide forward guidance. Here is an example from its September 13, 2012 statement, it was usually explicit about future policy:

> To support continued progress toward maximum employment and price stability, the Committee expects that a highly accommodative stance of monetary policy will remain appropriate for a considerable time after the economic recovery strengthens. In particular, the Committee also decided today to keep the target range for the

> federal funds rate at 0 to 1/4 percent and currently anticipates that exceptionally low levels for the federal funds rate are likely to be warranted at least through mid-2015.

Forward guidance was a temporary policy. Usually, the FOMC prefers to be unclear about its plans beyond its next meeting or two.

Quantitative easing may also work as a form of forward guidance. If people do not believe that the Fed will start raising interest rates until the Fed ended quantitative easing, then it may help lower long-term, interest rates by lowering expectations of future short-term interest rates.

Why 2%?

Another policy choice that the Fed makes is the target rate of inflation. The Fed, and other Central Banks, has chosen 2%. Why not 0?

1. Looking at (1) notice that a lower inflation target means a lower neutral rate. A 0% inflation target would give the Fed less ability to lower interest rates during a recession.

2. As we discussed earlier in the course, low and uniform inflation does not cause many problems. The social costs of a steady, 2% inflation rate are thus low.

3. Deflation (negative inflation) is usually more costly than an equal sized inflation. A 2% inflation rate provides a larger buffer against deflation.