TOPIC 9: MONETARY POLICY: STABILIZING THE DOMESTIC ECONOMY*

Fei Tan†

This lecture studies three different links: [i.] the link from the central bank's balance sheet to its policy tools; [ii.] the link from the policy tools to the policymakers' objectives; and [iii.] the link from monetary policy to the real economy. We begin with the operational details that define the tools central bankers have at their disposal. Then we turn to a discussion of the relationship between those tools and policymakers' objectives, and explain why modern monetary policy is equivalent to interest rate policy. Finally, we look at how the level of the target interest rate is chosen.

1 THE FEDERAL RESERVE'S CONVENTIONAL POLICY TOOLBOX

By buying or selling securities via open market operations, the Fed can control the quantity of reserves that commercial banks hold. It can also control the size of the monetary base and the price of its components. This section looks at the Fed's four conventional monetary policy tools.

The target federal funds rate and open market operations. We need to distinguish between the **target federal funds rate** and the **market (or effective) federal funds rate**—the interest rate at which banks borrow and lend reserves overnight. The target rate is set by the Federal Open Market Committee (FOMC), whereas the effective rate is determined in the market.

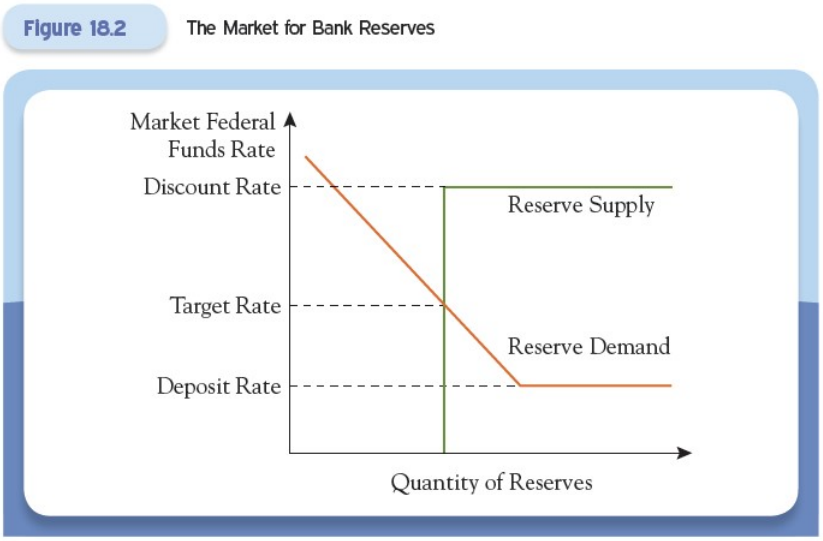
- The Fed allows the effective rate to fluctuate around its target within some range:
  - The **(primary) discount rate**—the interest rate the Fed charges on the loans it makes to banks—forms an upper bound;
  - The **deposit rate**—the interest rate the Fed pays on reserves that banks hold in their accounts at the Fed—forms a lower bound.
- The Fed uses open market operations to adjust the supply of reserves as required to keep the effective rate close to the target rate. In other words, the effective rate is

Date: March 11, 2015.

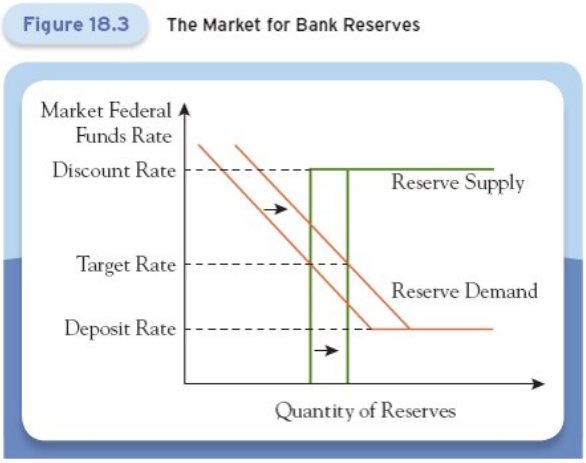
Disclaimer: these are notes that I used by myself to lecture from and for educational purposes only. The material presented here is largely based upon the undergraduate textbook by Stephen Cecchetti and Kermit Schoenholtz (2014), *Money, Banking and Financial Markets*, 4th Edition, McGraw-Hill/Irwin. Please do NOT circulate.

†Department of Economics, Indiana University Bloomington. E-mail: tanf@indiana.edu

determined by the supply and demand of reserves in the market. See Figure 18.2 below.



- As the demand for reserves shifts or the FOMC decides to change their target rate, the Fed uses open market operations to shift the supply of reserves to accommodate the change, ensuring that the effective rate is close to the target rate. See Figure 18.3 below.



Discount lending and lender of last resort. Lending by the Fed to commercial banks is called **discount lending**.[1] By controlling the quantity of loans, the Fed can control the size of reserves, the size of the monetary base, and eventually interest rates. The Fed, by making loans to banks when no one else will or can, serves as the **lender of last resort**. The Fed makes three types of loans to meet its interest-rate stability objective:

[1] Discount lending is the Fed's primary tool for ensuring short-term financial stability. Note that the Fed does not make uncollateralized loans.

- **Primary credit** is extended on a very short-term basis to institutions that the Fed's bank supervisors deem to be sound.
- **Secondary credit** is extended to institutions that are not sufficiently sound to qualify for primary credit.
- **Seasonal credit** is primarily extended to small agricultural banks in the Midwest to help in managing the cyclical nature of farmers' loans and deposits.

Reserve requirements. The **reserve requirement** is the level of balances a bank is required to hold either as vault cash or on deposit at the Fed. Recall that changes in the reserve requirement affect the money multiplier and the quantity of money and credit circulating in the economy.

2 Operational Policy at the European Central Bank (ECB)

Assigned as reading. You should know that the ECB's monetary toolbox contains an overnight interbank rate (equivalent to the federal funds rate), a lending rate (equivalent to the discount rate), a reserve deposit rate, and a reserve requirement.[2]

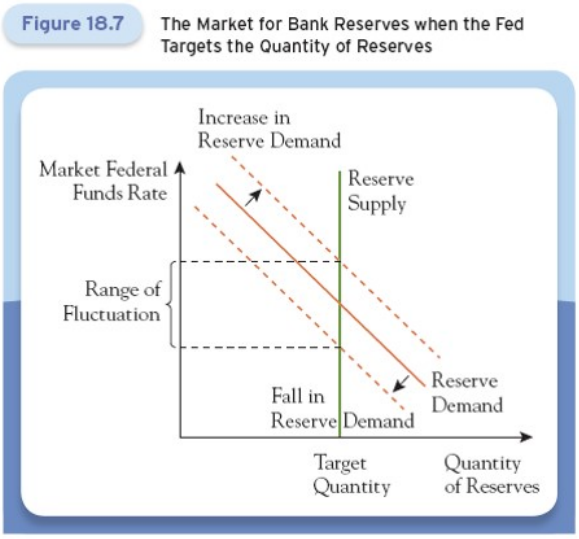
3 Linking Tools to Objectives: Making Choices

Central bankers use various tools to meet their policy objectives—low and stable inflation, high and stable growth, stable financial system, stable interest and exchange rates—and they need to decide which tools are the best for the job.

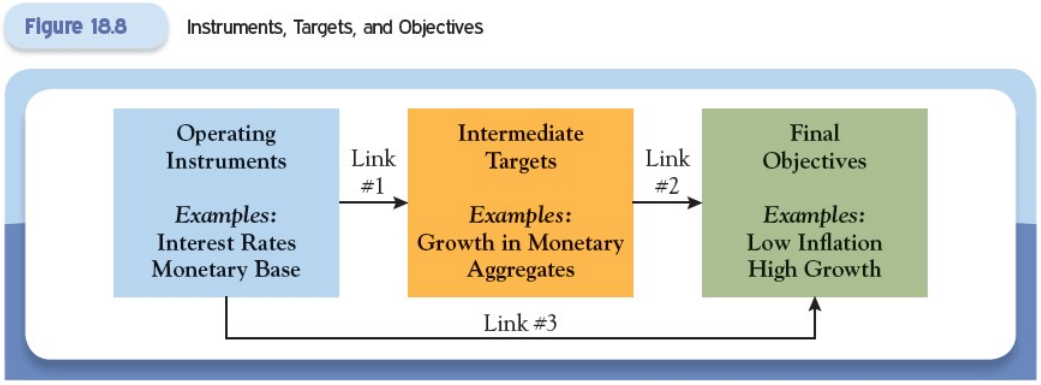
- A good monetary policy instrument has three features:
  - Easily observable by everyone;
  - Controllable and quickly changed;
  - Tightly linked to the policymakers' objectives.

  Because interest rates are the primary linkage between the financial system and the real economy, stabilizing growth means keeping interest rates from being overly volatile. This is the main reason the Fed targets the federal funds rate rather than some quantity on its balance sheet. The latter leads to excessively volatile federal funds rate. See Figure 18.7 below.

[2]The ECB provides reserves to the European banking system primarily through collateralized loans called **repurchase agreements (repo)**—the ECB purchases securities together with an agreement for the seller to buy them back at a later date. Note that the repurchase price should be greater than the original sale price, the difference sometimes called the repo rate. The ECB serves as a lender and the seller acts as a borrower, using its securities as collateral for loans at an interest rate given by the repo rate.



- Operating instruments and intermediate targets. **Operating instruments** refer to actual policy tools that the central bank controls directly. **Intermediate targets** refer to instruments that are not under direct control of the central bank but lie between operating instruments and policy objectives. See Figure 18.8 below.



4 A Guide to Central Bank Interest Rates: The Taylor Rule

A simple formula that approximates how the FOMC sets the target federal funds rate is given by the **Taylor rule** after John Taylor:

$$\text{target fed funds rate} = 2 + \text{current inflation} + \frac{1}{2} \times \text{inflation gap} + \frac{1}{2} \times \text{output gap} \quad (4.1)$$

Four remarks:

- This rule assumes a long-term real interest rate of 2%. The inflation gap is current inflation minus an inflation target; the output gap is the percentage deviation of current real GDP from its potential level.

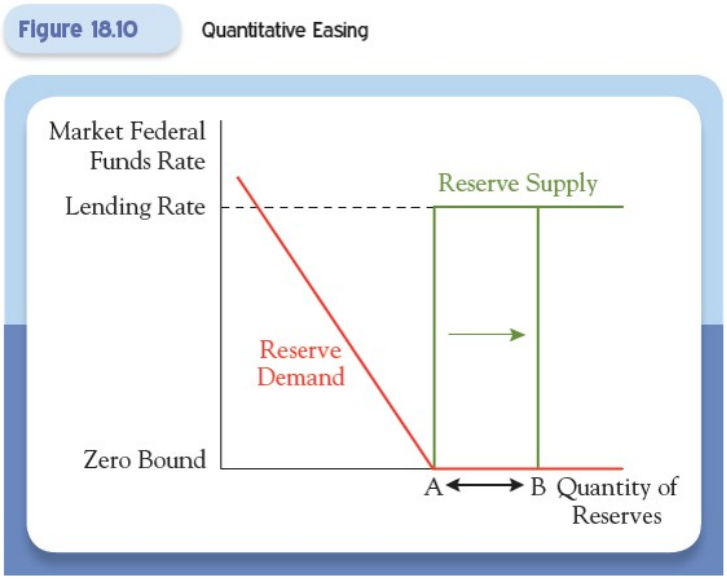
- When inflation rises above its target level, the response is to raise interest rates; when output falls below the target level, the response is to lower interest rates.
- An increase in inflation affects two terms in the Taylor rule, current inflation and inflation gap, leading to a more than one-for-one increase in the target fed funds rate. This raises the real interest rate, slows the economy, and hence lowers the inflation.
- The effective fed funds rate can be thought of as the target rate perturbed by a random "shock" that is captured by neither inflation gap nor output gap:

$$\text{effective fed funds rate} = \text{target fed funds rate} + \text{monetary policy shock} \tag{4.2}$$

5 Unconventional Policy Tools

There are two circumstances when unconventional policy tools can play a useful stabilization role: [i.] when lowering the target fed funds rate to zero is insufficient to stimulate the economy; and [ii.] when an impaired financial system prevents conventional interest-rate policy from supporting economic growth. Three categories of unconventional policy tools:

- **Forward guidance**, in which the Fed communicates its intentions about the future path of monetary policy.
- **Quantitative easing (QE)**, in which the Fed supplies aggregate reserves beyond the level needed to maintain its policy rate target. It increases the size of the Fed's balance sheet. See Figure 18.10 below.



- **Targeted asset purchase (TAP)**, in which the Fed alters the mix of assets on its balance sheet in order to change their relative prices (interest rate) in a way that stimulates economic activity.