

Lecture Notes on

**MONEY, BANKING,
AND FINANCIAL MARKETS**

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Chapter 15c: The Fed's Control of the Monetary Base

1. Control of the Monetary Base

Open Market Operations

Discount Loans

Shifts from Deposits into Currency

2. Overview of the Fed's Control of the Monetary Base

Recall that in our simple model of multiple deposit creation showed how the Federal Reserve can give rise to an expansion (or contraction) of deposits by supplying more (or less) reserves to the banking system.

More specifically, our simple model indicates that if the Fed wants to bring about a change in deposits, it can perform an open market operation or make a discount loan to change the level of reserves and then rely on the formula

$$\Delta D = \frac{1}{r} \times \Delta R.$$

But recall, also, that in deriving our simple model, we made two unrealistic assumptions:

Banks never hold excess reserves.

Individuals and non-bank corporations never hold currency.

Accordingly, our next major goal will be to consider how the money supply works in a more general and realistic setting, where banks' decisions about excess reserve holdings and depositors' decisions about currency holdings are explicitly taken into account.

But to set the stage for this more general and realistic analysis, it will help to begin by working through another set of examples that show how the Fed can exercise much more precise control over the monetary base than it can over reserves alone.

These examples will trace out what happens to both reserves and the monetary base when:

The Fed conducts an open market operation.

The Fed makes a new discount loan.

Individuals and non-bank corporations shift funds out of deposits and into currency.

These examples will allow us to conclude our analysis of Mishkin's Chapter 15 with an overview of the Fed's control of the monetary base.

1 Control of the Monetary Base

Recall from our introductory discussion of the Federal Reserve's balance sheet that if

MB = monetary base = high-powered money

C = currency in circulation (outside of banks)

R = reserves

then, by definition,

$$MB = C + R.$$

We've already seen how the Fed can influence the level of reserves by conducting open market operations and by making discount loans.

And the definition $MB = C + R$ suggests that by changing the level of reserves R , the Fed can also change the level of the monetary base MB .

And this is true. It turns out, however, that the Fed can actually exercise more precise control over the monetary base as a whole than it can over reserves alone.

To see why, let's consider a set of examples.

1.1 Open Market Operations

One way that the Fed can change reserves, and hence the monetary base as well, is through open market operations.

At this point, as we seek to make our analysis more general, it is useful to distinguish between two types of open market operations:

Open market purchase = purchase of US government securities by the Fed.

Open market sale = purchase of US government securities by the Fed.

Let's take a look at three examples of open market purchases.

Example 1: Open Market Purchase from a Bank

When the Fed decides to make an open market purchase, the open market desk at the Federal Reserve Bank submits a buy order to the over-the-counter (OTC) market for US government securities, just like any other investor.

And just like any other investor, the Fed can't be sure at the time it places its buy order who the seller will be.

But suppose that it turns out that Fleet Bank—or some other bank—has placed a sell order at the same time that the Fed places its buy order.

The Fed's buy order is matched with Fleet's sell order in the OTC market, and the Fed buys \$100 in US Treasury bills from Fleet.

Fleet receives a \$100 check from the Fed, which it deposits in its account at the Fed.

FLEET

Assets	Liabilities
Reserves +\$100	
Securities -\$100	

FEDERAL RESERVE

Assets	Liabilities
Securities +\$100	Reserves +\$100

In this case, reserves increase by \$100 and, since currency in circulation does not change, the monetary base also increase by \$100.

Example 2: Open Market Purchase from the Non-Bank Public I

Suppose once again that the Fed decides to make an open market purchase.

But suppose that this time, the Fed's buy order is matched with a sell order placed not by a bank but instead by an individual or a non-bank corporation.

So in this example, the Fed buys \$100 in US Treasury bills from the non-bank public.

The seller of the Treasury bills receives a \$100 check from the Fed, which he or she will deposit in his or her checking account at Fleet Bank:

NON-BANK PUBLIC

Assets		Liabilities
Checkable Deposits	+\$100	
Securities	-\$100	

Fleet Bank will then deposit the check in its account at the Fed:

FLEET

Assets		Liabilities
Reserves	+\$100	Checkable Deposits
		+\$100

FEDERAL RESERVE

Assets		Liabilities
Securities	+\$100	Reserves
		+\$100

In this case, the effect of the open market purchase on the Fed's balance sheet is the same as if the Fed had purchased the Treasury bill directly from a bank: reserves increase by \$100, and since currency in circulation does not change, the monetary base also increases by \$100.

Example 3: Open Market Purchase from the Non-Bank Public II

Suppose that the Fed purchases \$100 in US Treasury bills from an individual or a non-bank corporation, as just described above.

But now suppose that instead of depositing the Fed's check in his or her checking account, the seller cashes the Fed's check at Fleet Bank:

NON-BANK PUBLIC

Assets		Liabilities
Currency	+\$100	
Securities	-\$100	

Fleet Bank pays out \$100 in vault cash and deposits the Fed's check in its account at the Fed:

FLEET

Assets	Liabilities
Vault Cash -\$100	
Deposits at the Fed +\$100	

Reserves are unchanged, but currency in circulation has increased by \$100:

FEDERAL RESERVE

Assets	Liabilities
Securities +\$100	Currency in Circulation +\$100

In this case, the open market purchase has no effect on reserves. But since currency in circulation increases by \$100, the monetary base also increases by \$100.

Comparing examples 2 and 3 shows that the effect of an open market purchase on reserves depends on whether the seller of securities keeps the proceeds from the sale as currency or as deposits.

But the effect of the open market purchase on the monetary base is always the same: the monetary base rises, regardless of whether then seller keeps the proceeds as currency or as deposits.

Conclusion: Since the Fed does not know whether sellers of securities will hold the proceeds as currency or as deposits, the effects of an open market purchase on the monetary base are much more certain than the effects of an open market purchase on reserves. In this sense, the Fed can control the monetary base much more precisely that it can control reserves.

What about open market sales?

If the Fed sells \$100 in US Treasury bills, and the buyer pays with a check, then:

Reserves fall by \$100.

Currency in circulation remains unchanged.

The monetary base falls by \$100.

If the Fed sells \$100 in US Treasury bills, and the buyer pays with currency, then:

Reserves remain unchanged.

Currency in circulation falls by \$100.

The monetary base falls by \$100.

Once again, the Fed controls the monetary base much more precisely than it controls reserves.

1.2 Discount Loans

All of our examples so far have looked at the effects of open market operations.

But we also know from before that the Fed can increase reserves by making discount loans to banks.

How do discount loans affect the monetary base?

Suppose that Fleet Bank borrows \$100 as a discount loan from the Fed.

When it makes this loan, the Fed credits Fleet's account at the Fed with an additional \$100:

FLEET

Assets	Liabilities
Reserves +\$100	Borrowings +\$100

FEDERAL RESERVE

Assets	Liabilities
Discount Loans +\$100	Reserves +\$100

When the Fed makes a \$100 discount loan, reserves increase by \$100, and since currency in circulation does not change, the monetary base also increases by \$100.

1.3 Shifts from Deposits into Currency

As a final example, let's consider what happens when a depositor withdraws \$100 from his or her checking account at Fleet Bank:

NON-BANK PUBLIC

Assets	Liabilities
Currency +\$100	
Checkable Deposits -\$100	

We know from our analysis of bank management that when Fleet loses \$100 in deposits, it loses an equal amount of reserves:

FLEET

Assets	Liabilities
Reserves -\$100	Checkable Deposits -\$100

Reserves have decreased by \$100, but currency in circulation has increased by \$100:

FEDERAL RESERVE

Assets	Liabilities
	Currency in Circulation +\$100
	Reserves -\$100

The monetary base remains unchanged!

Conclusion: Shifts from deposits into currency increase currency in circulation, but decrease reserves by an equal amount, leaving the monetary base unchanged. Since the Fed cannot predict exactly when these shifts will occur, it controls the monetary base more precisely than it controls reserves.

Note that the same conclusion applies when one of Fleet's depositors decides to deposit \$100 in currency into his or her checking account. In this case, currency in circulation decreases by \$100. And since Fleet gains \$100 in vault cash, reserves increase by an equal amount. Hence, reserves increase by \$100, but the monetary base remains unchanged. Once again, the Fed controls the monetary base more precisely than it controls reserves.

2 Overview of the Fed's Control of the Monetary Base

The Fed can control the monetary base by conducting open market operations:

A \$100 open market purchase increases the monetary base by \$100, but may or may not increase reserves.

A \$100 open market sale decreases the monetary base by \$100, but may or may not decrease reserves.

The Fed can also control the monetary base by making discount loans:

A \$100 discount loan increases the monetary base by \$100, and also increases reserves.

Random shifts from deposits into currency, and from currency into deposits, do not affect the monetary base, but do change reserves.

Conclusion: The Fed controls the monetary base much more precisely than it controls reserves.