Ec 370

Money and Banking

Chapter 14: The Money Supply Process - PART I

Xiang LI
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- Recall Chapter 3: Money is also called **money supply**
  - 2 measurements of money supply
    - M1: the most liquid assets (currency, checkable deposits..)
    - M2: M1 + less liquid assets (savings deposits, time deposits..)
- This lecture: control of **monetary base**
- Next lecture: control of **money supply**

Control of Monetary Base

There are 3 Players in the **Money Supply Process**

- **central bank**
  - The Fed's conduct of monetary policy involves actions that affect its holdings of assets and liabilities
- **banks**: depository institutions
  - accept deposits from individuals and institutions and make loans
- **depositors**
  - individuals and institutions that hold deposits in banks

A simplified Fed's Balance Sheet

Assets	Liabilities
Securities	Currency in circulation
Loans to financial institutions	Reserves

- Liabilities of the Fed is also called **Monetary Liabilities**, **Monetary Base**, **High-powered Money**
- Liabilities of the Fed consists of:
  - Currency in circulation
  - Reserves

Liabilities

(1) Currency in Circulation

- currency: Federal Reserve notes

- **currency in circulation**: the amount of currency in the hands of the **nonbank public**

- currency in circulation are assets for the nonbank public but liabilities for the Fed

Liabilities

(2) Reserves

Reserves include:

- bank deposits at the Fed: All banks have an account at the Fed in which they hold deposits
- currency held by banks (vault cash)

Reserves consists of **required reserves** and **excess reserves**

- reserves are assets for the banks but liabilities for the Fed

A simplified Fed's Balance Sheet

Assets	**Liabilities**
Securities	Currency in circulation
Loans to financial institutions	Reserves

- Assets of the Fed consist of:
  - Securities
  - Loans to financial institutions: discount loans

Assets

(1) Securities

- securities: Fed's holdings of T-bills/T-notes/T-bonds issued by the U.S. Treasury
  - ch 9: banks can buy municipal bonds but the Fed can't

- purchasing securities is the primary way in which the Fed provides **reserves** to the banking system
  - the Fed buys U.S. Treasury securities from banks **with reserves**
  - this leads to an increase in the money supply

Assets

(2) Loans to financial institutions

- The second way in which the Fed can provide **reserves** to the banking system is by making loans to banks and other financial institutions
  - the Fed makes loans to banks **with reserves**
  - this leads to an increase money supply
- Loans to financial institutions are also called **discount loans**, **borrowings from the Fed**, **borrowed reserves**
- discount loans are liabilities for banks but assets for the Fed

- interest rates on the Fed's monetary liabilities:
  - 0% paid by the Fed for currency in circulation
  - interest rates paid on by the Fed reserves are very low
    - banks' deposits at the Fed earn very low interest rates for banks
- interest rate on the Fed's assets
  - interest rates on U.S. Treasury securities are relatively high
  - interest rates on discount loans are relatively high too (**discount rate**)
- The Fed's assets earn income, and liabilities cost practically nothing

Control of Monetary Base

- Monetary Base MB consists of:
  - currency in circulation, C
  - reserves, R
- $MB = C + R$
- The Fed control the **monetary base** through:
  - (primary) **open market operations**: purchases or sales of securities in the open market
  - **discount loans** to banks

Control of Monetary Base

- open market purchase: a purchase of bonds by the Fed
  - **reserves** go from Fed to banking system
- open market sale: a sale of bonds by the Fed
  - **reserves** go from banking system to Fed
- Discount loans are made to banking system:
  - **reserves** go from Fed to banking system
- Discount loans are paid off:
  - **reserves** go from banking system to Fed

Participation 9

Let's continue with Participation #9

*Instruction: To complete this balance sheets, show the **changes** of values for each item. For example, if you think the value of an item decreased by $10, write down -$10. If you think the value of an item increases by $10, write down +$10. If you think the value of an item isn't changed, leave it blank*

Participation: Open Market Purchase

Q3 (1): Suppose the Fed purchases $100 million of bonds from banking system, update the balance sheet.

Banking System	
Assets	**Liabilities+Capital**
Reserves	Deposits
Securities	Borrowings
Loans	Capital

Federal Reserve System	
Assets	**Liabilities**
Securities	Currency in circulation
Loans to financial institutions	Reserves

Participation: Open Market Purchase

Banking System	
Assets	**Liabilities+Capital**
Reserves: +$100m	Deposits
Securities: -$100m	Borrowings
Loans	Capital

Federal Reserve System	
Assets	**Liabilities**
Securities: +$100m	Currency in circulation
Loans to financial institutions	Reserves: +$100m

- the Fed pays for the bonds with reserves: causes reserves (R) to increase by an equal amount
- monetary base equals currency plus reserves (MB=C+R): increases the monetary base by an equal amount

Participation: Open Market Sale

- Q3 (2): Suppose the Fed conducts an open market sale of $100 million of bonds to banking system, update the balance sheet.

Banking System	
Assets	**Liabilities+Capital**
Reserves	Deposits
Securities	Borrowings
Loans	Capital

Federal Reserve System	
Assets	**Liabilities**
Securities	Currency in circulation
Loans to financial institutions	Reserves

Participation: Open Market Sale

Banking System	
Assets	**Liabilities+Capital**
Reserves: -$100m	Deposits
Securities: +$100m	Borrowings
Loans	Capital

Federal Reserve System	
Assets	**Liabilities**
Securities: -$100m	Currency in circulation
Loans to financial institutions	Reserves: -$100m

- Open market sale causes reserves to decrease by an equal amount, and decreases the monetary base by an equal amount

Participation: Loans to Banking System

- Q3 (3): Suppose the Fed makes a $100 million loan to the banking system, update the balance sheet.

Banking System	
Assets	**Liabilities+Capital**
Reserves	Deposits
Securities	Borrowings
Loans	Capital

Federal Reserve System	
Assets	**Liabilities**
Securities	Currency in circulation
Loans to financial institutions	Reserves

Participation: Loans to Banking System

Banking System	
Assets	**Liabilities+Capital**
Reserves: +$100m	Deposits
Securities	Borrowings: +$100m
Loans	Capital

Federal Reserve System	
Assets	**Liabilities**
Securities	Currency in circulation
Loans to financial institutions: +$100m	Reserves: +$100m

- because the Fed lends out with reserves: reserves increased by the equal amount
- because the monetary base equals currency plus reserves (MB=C+R): monetary base increased by the equal amount

Participation: Loans Paid Off

- Q3 (4): Suppose First National Bank pays off the $100 million loan to the Fed, update the balance sheet.

Banking System	
Assets	**Liabilities+Capital**
Reserves	Deposits
Securities	Borrowings
Loans	Capital

Federal Reserve System	
Assets	**Liabilities**
Securities	Currency in circulation
Loans to financial institutions	Reserves

Participation: Loans Paid Off

Banking System	
Assets	**Liabilities+Capital**
Reserves: -$100m	Deposits
Securities	Borrowings: -$100m
Loans	Capital

Federal Reserve System	
Assets	**Liabilities**
Securities	Currency in circulation
Loans to financial institutions: -$100m	Reserves: -$100m

- banking system paying off the $100 million loan to the Fed causes reserves decreases by the equal amount, and monetary base decreases by the equal amount

Shifts from Deposits into Currency

- Now, the Fed does not conduct open market operations
- Instead, suppose there is a shift from deposits to currency
- during the Christmas season, the public wants to hold more currency to buy gifts and so withdraws $100 million in cash
- T-account of the nonbank public:

Nonbanking System	
Assets	**Liabilities+Capital**
Checkable deposits: -$100m	
Currency: +$100m	

Shifts from Deposits into Currency

- The banking system loses 100 million of deposits and hence 100 million of reserves

Banking System	
Assets	**Liabilities+Capital**
Reserves: -$100m	Deposits: -$100m
Securities	Borrowings
Loans	Capital

Shifts from Deposits into Currency

- 100 million of additional currency is circulating in the hands of the public, while reserves in the banking system have fallen by 100 million

Federal Reserve System	
Assets	**Liabilities**
Securities	Currency in circulation:+$100m
Loans to financial institutions	Reserves: -$100m

- Net Result: reserves are affected, but monetary base is unaffected by the public's increased desire for cash

Summary: control of monetary base

Two ways for the Fed to determine **monetary base**: open market operations and lending to financial institutions

- amount of **open market purchases or sales** is completely controlled by the Fed
  - The Fed places purchase or sale orders in U.S. Treasury bond markets
  - U.S. Treasury bond are liquid and welcomed, so banks always take the orders
- amount of **lending to financial institutions** cannot be unilaterally determined and perfectly predicted by the Fed
  - The Fed sets the discount rate, then banks make decisions about whether to borrow
  - the Fed cannot force banks to borrow

Hence, split the monetary base MB into 2 components:

- **nonborrowed monetary base**, MB_n
  - from open market operations
- borrowed reserves, BR
  - from lending to financial institutions
- $BR + MB_n = MB$
- $MB_n = MB - BR$