통화

21. The Monetary System

Seoul National University

Questions in this chapter

- What assets are considered "money"?
  What are the functions of money?
  The types of money?
- What is the Federal Reserve?
- What role do banks play in the monetary system?
  How do banks "create money"?
- How does the Federal Reserve control the money supply?

What Money Is and Why It's Important

물물교환

- Without money, trade would require *barter*, the exchange of one good or service for another.
- Every transaction would require a *double coincidence of wants* – the unlikely occurrence that two people each have a good the other wants.
- Most people would have to spend time searching for others to trade with – a huge waste of resources.
- This searching is unnecessary with *money*, the set of assets that people regularly use to buy goods & services from other people.

The 3 Functions of Money

- **Medium of exchange:** an item buyers give to sellers when they want to purchase goods & services
- **Unit of account:** the yardstick people use to post prices and record debts

가치저장수단

- **Store of value:** an item people can use to transfer purchasing power from the present to the future

The 2 Kinds of Money

상품화폐 (실물화폐) 고유적 가치

- **Commodity money:** takes the form of a commodity with intrinsic value
  Examples: gold coins, cigarettes in POW camps

명목화폐

- **Fiat money:** money without intrinsic value, used as money because of government decree
  Example: the U.S. dollar

The Money Supply

- The **money supply** (or **money stock**): the quantity of money available in the economy
- What assets should be considered part of the money supply? Two candidates:
  지폐, 주화
  - **Currency:** the paper bills and coins in the hands of the (non-bank) public
  - **Demand deposits:** balances in bank accounts that depositors can access on demand by writing a check

은행계좌 (요구불 예금) 은행에가면 받을 수 있는 돈

Measures of the U.S. Money Supply

M0 중앙은행에서 찍어낸양

- **M1 (협의통화):** currency, demand deposits, traveler's checks, and other checkable deposits.
  M1 = \$2.3 trillion (June 2012)
  M1 = 484.1조원 (2013)

  아무때나 현금화가 가능한 것.
  + 현금

  적금?

- **M2 (광의통화):** everything in M1 plus savings deposits, small time deposits, money market mutual funds, and a few minor categories.
  M2 = \$9.9 trillion (June 2012)
  M2 = 1885.8조원 (2013)
- GDP와 비교. 2013년 명목 GDP= 1428.3조원

The distinction between M1 and M2 will often not matter when we talk about "the money supply" in this course

Central Banks & Monetary Policy

- **Central bank:** an institution that oversees the banking system and regulates the money supply
- **Monetary policy:** the setting of the money supply by policymakers in the central bank
- **Federal Reserve (Fed):** the central bank of the U.S.

Bank Reserves

- In a fractional reserve banking system, banks keep a fraction of deposits as **reserves** and use the rest to make loans.

- The Fed establishes **reserve requirements**, regulations on the minimum amount of reserves that banks must hold against deposits.

- Banks may hold more than this minimum amount if they choose.

지불준비율 , 지급준비율

- The **reserve ratio,** R
  $=$ fraction of deposits that banks hold as reserves
  $=$ total reserves as a percentage of total deposits

Banks and the Money Supply: An Example

- Suppose $100 of currency is in circulation. To determine banks' impact on money supply, we calculate the money supply in 3 different cases:

CASE 1: **No banking system**
Public holds the $100 as currency.
Money supply = $100.

CASE 2: **100% reserve banking system**
Public deposits the $100 at First National Bank (FNB). FNB holds 100% of deposit as reserves:
Money supply = currency + deposits = $0 + $100 = $100

CASE 3: **Fractional reserve banking system**
Suppose $R = 10\%$. FNB loans all but 10% of the deposit: Depositors have $100 in deposits, borrowers have $90 in currency.
Money supply = C + D = $90 + $100 = $190 (!!!)

Banks and the Money Supply: An Example (Cont'd)

- In **Fractional reserve banking system**, the money supply suddenly grow. When banks make loans, they create money. The borrower gets
  - \$90 in currency—an asset counted in the money supply
  - \$90 in new debt—a liability that does not have an offsetting effect on the money supply

  This is not the end of the story. The process continues, and money is created with each new loan.

The Money Multiplier

- Money multiplier: the amount of money the banking system generates with each dollar of reserves
- The money multiplier equals $1/R$.
- In our example, $R = 10\%$

$$\text{money multiplier} = 1/R = 10$$

\$100 of reserves creates \$1000 of money

$$100 \cdot \frac{1}{R} = \boxed{\$1000} = \$100 + \$90 + \$81 + \$72.9 + \cdots = \frac{100}{1-0.9}$$

$$\frac{100}{1-(1-0.1)}$$

$R = 0.1$

A More Realistic Balance Sheet

더 현실적인 대차 대조표

- Assets: Besides reserves and loans, banks also hold securities.
- Liabilities: Besides deposits, banks also obtain funds from issuing debt and equity.
- Bank capital: the resources a bank obtains by issuing equity to its owners
  - Also: bank assets minus bank liabilities
- Leverage: the use of borrowed funds to supplement existing funds for investment purposes

A More Realistic Balance Sheet

대차대조표

자산 | 부채 ← (개인)
예금 | 학자금 대출
자동차 | 신용카드 빚
오토바이 |

자산(내꺼) | 부채 (빚)
아파트 (3억) | 대출 (2억)

(은행)

금고

대출

Assets		Liabilities	
Reserves	\$200	Deposits	\$800
Loans	700	Debt	150
Securities	100	Bank Capital	50

은행자산

→ 소비자 빚

빚 (다른은행 등)

자기자본

- Leverage ratio: the ratio of assets to bank capital
- In this example, the leverage ratio $= \$1000/\$50 = 20$ 배 (은행)
- Interpretation: for every \$20 in assets, \$1 is from the bank's owners, \$19 is financed with borrowed money.

자산 | 부채
Reserve | 예금 100
Case 2 100 (100%)
Case 3 ← or 10 (10%)

Leverage Amplifies Profits and Losses

지렛대 비율

- In our example, suppose bank assets appreciate by 5%, from \$1000 to \$1050. This increases bank capital from \$50 to \$100, doubling owners' equity.
- Instead, if bank assets decrease by 5%, bank capital falls from \$50 to \$0.
- If bank assets decrease more than 5%, bank capital is negative and bank is insolvent.
- Capital requirement: a govt regulation that specifies a minimum amount of capital, intended to ensure banks will be able to pay off depositors and debts.

Leverage, Financial Crisis, and Government's Response

- In the financial crisis of 2008–2009, banks suffered losses on mortgage loans and mortgage-backed securities due to widespread defaults.
- Many banks became insolvent : In the U.S., 27 banks failed during 2000–2007, 166 during 2008–2009.
- Many other banks found themselves with too little capital, responded by reducing lending, causing a credit crunch.

  계속 망한다 연쇄 부도

- To ease the credit crunch, the Federal Reserve and U.S. Treasury injected hundreds of billions of dollars' worth of capital into the banking system.
- The policy succeeded in recapitalizing the banking system and helped restore lending to normal levels in 2009.

The Fed's Tools of Monetary Control

1/지급준비율

중앙은행이 찍어낸 돈의 양

$1/R$

- Earlier, we learned

$$\boxed{\text{money supply} = \text{money multiplier} \times \text{bank reserves}}$$

M1

- The Fed can change the money supply by changing bank reserves or changing the money multiplier.

중앙은행이 국채채권 매입 → 통화량↑ → 채권가격↑

How the Fed Influences Reserves

→ 이자율↓

공개 시장 조작 정책

1. **Open-Market Operations (OMOs):** the purchase and sale of U.S. government bonds by the Fed.
    - If the Fed buys a government bond from a bank, it pays by depositing new reserves in that bank's reserve account.
      With more reserves, the bank can make more loans, increasing the money supply.
    - To decrease bank reserves and the money supply, the Fed sells government bonds.

2. The Fed makes loans to banks, increasing their reserves. 실제로 잘 안쓴다.
    - Traditional method: adjusting the discount rate–the interest rate on loans the Fed makes to banks–to influence the amount of reserves banks borrow
    - New method: Term Auction Facility–the Fed chooses the quantity of reserves it will loan, then banks bid against each other for these loans.

3. The more banks borrow, the more reserves they have for funding new loans and increasing the money supply. R↓ → 통화량↑

How the Fed Influences the Reserve Ratio

- Recall: $\boxed{\text{reserve ratio} = \text{reserves/deposits}}$, which inversely affects the money multiplier.
- The Fed sets reserve requirements: regulations on the minimum amount of reserves banks must hold against deposits. Reducing reserve requirements would lower the reserve ratio and increase the money multiplier.
- Since 10/2008, the Fed has paid interest on reserves banks keep in accounts at the Fed. Raising this interest rate would increase the reserve ratio and lower the money multiplier.

Problems Controlling the Money Supply

- If households hold more of their money as currency, banks have fewer reserves, make fewer loans, and money supply falls.
- If banks hold more reserves than required, they make fewer loans, and money supply falls.
- Yet, Fed can compensate for household and bank behavior to retain fairly precise control over the money supply.


664

예금인출사태

Bank Runs and the Money Supply

- A run on banks: When people suspect their banks are in trouble, they may “run” to the bank to withdraw their funds, holding more currency and less deposits.
- Under fractional-reserve banking, banks don’t have enough reserves to pay off ALL depositors, hence banks may have to close.
- Also, banks may make fewer loans and hold more reserves to satisfy depositors.
- These events increase R and cause money supply to fall.
- During 1929–1933, a wave of bank runs and bank closings caused money supply to fall 28
- Many economists believe this contributed to the severity of the Great Depression.
- Since then, federal deposit insurance has helped prevent bank runs in the U.S.
- In the U.K., though, Northern Rock bank experienced a classic bank run in 2007 and was eventually taken over by the British government.

The Federal Funds Rate

기준금리 미국버전

- On any given day, banks with insufficient reserves can borrow from banks with excess reserves.
- The interest rate on these loans is the federal funds rate.
- The FOMC uses OMOs to target the fed funds rate.
- Changes in the fed funds rate cause changes in other rates and have a big impact on the economy.

Monetary Policy and the Fed Funds Rate

- To raise fed funds rate, Fed sells govt bonds (OMO).
- This removes reserves from the banking system, reduces supply of federal funds.
- This, in turn, causes the Fed Funds rate to rise.

한국경제신문에서 발췌 (2010.3.22)

- 한국은행이 경제 전반에 큰 영향을 미치는 것은 통화량을 조절하기 때문.
- 한은이 통화량을 조절하는 방법은 기준금리 조절, 지급준비율 조정, 재할인율 조정의 3가지 방법이 있음.
- 지급준비율이나 재할인율은 한은이 일방적으로 정하며, 기준금리조절은 한은이 공개시장에서 채권을 사고팔면서 시중금리와 통화량을 조절하는 것.

1. 기준금리는 금융회사 간 거래되는 초단기 금리 공개시장 조작
   - 2008년 3월부터는 7일물 환매조건부채권(RP) 금리를 기준.
2. 지급준비율은 고객의 예금인출에 대비 은행들이 한은에 맡겨두어야 하는 돈의 비율. 예금액의 몇%로 나타냄. 지급준비율
   - 우리나라의 평균 지급준비율은 현재 3% 선.
   - 은행들은 예금액의 3%를 한국은행에 예탁하고 나머지는 대출함. 총대출금의 크기는 지급준비금에 의해 제약.
   - 지급준비율이 5%로 올라가면 대출재원이 줄어 실제 줄어드는 대출액은 지급준비율의 승수에 해당.
3. 재할인율은 은행이 한은으로부터 단기자금을 빌릴 때 적용되는 금리. 현행 재할인율은 1.25%. 돈빌려주기
   - 그러나 한은으로부터 직접 돈을 빌리면 은행의 평판이 나빠져 실제 재할인하는 은행은 거의 없음.

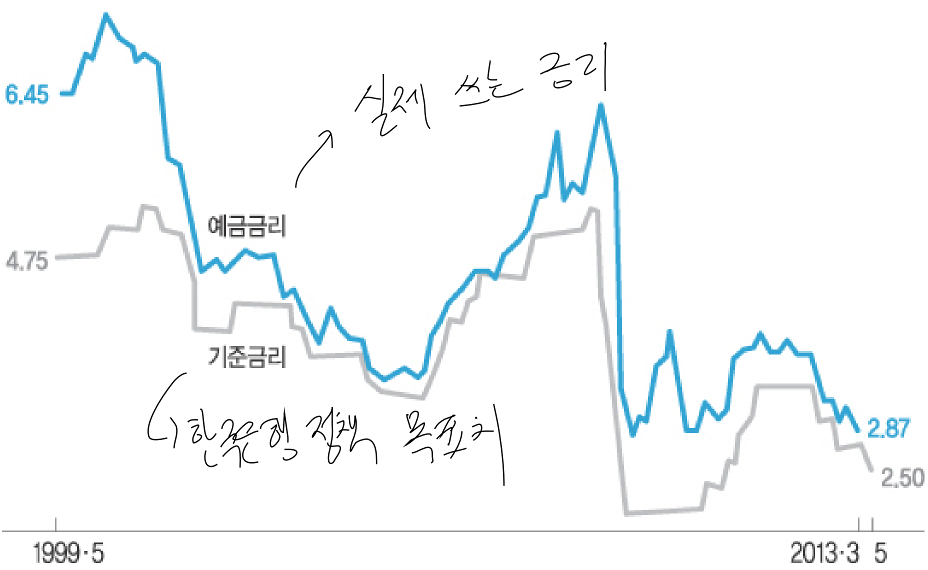
경향신문에서 발췌 (2013.5.19)

- **기준금리란?:** “기준금리는 중앙은행이 정하는 금리를 뜻합니다. 우리나라는 한국은행의 금융통화위원회에서 기준금리를 결정하지요.”
- **수요와 공급에 따라 금리를 결정하면 되지, 왜 한국은행이 기준금리를 결정할까?**
  “수요와 공급에 따라 결정되는 금리가 늘 좋은 결과를 가져오는 것은 아니기 때문입니다. 예를 들어 금리가 너무 낮으면, 경제 구성원들이 돈을 빌리기 쉬워집니다. 이 때 쉽게 돈을 빌려서 집을 사거나, 주식을 사면 자산시장에 거품이 생길 수 있어요. 몇 해 전 발생한 미국 부동산 시장의 부실 문제도 결국 지나치게 낮은 금리가 가져온 부작용으로 볼 수 있습니다.”

경향신문에서 발췌 (2013.5.19) (계속)

- **한국은행의 금리 결정은 어떤 효과가 있나?**
  "한국은행은 금리를 결정함으로써 경제주체들에게 나름의 신호를 보냅니다. 기준금리 결정이 경제주체들에게 영향을 줄 수 있는 것은 통화량의 규모를 결정하는 기관이 한국은행이기 때문이죠. 한국은행이 통화량을 늘린다는 말은 결국 경제에 돈이 많이 풀린다는 의미입니다. 이 경우 돈을 구하기 쉬워지기 때문에 돈의 가치인 금리는 떨어집니다. 반대로 통화량을 줄이면 돈을 구하기가 힘들어지게 돼 금리는 올라가는 것이죠.
  기준금리의 방향에 따라서 경제주체들의 이해관계가 엇갈리기 때문에 한국은행의 결정은 그만큼 무거운 무게를 가집니다. 중앙은행의 정치적 독립성이 요구되는 것도 이 때문이죠. 정치는 경제적 이해 관계의 다른 표현인 경우가 많아요. 중앙은행은 정치에 휘둘리지 않고 불편부당한 결정을 내려야 한다는 점에서 중앙은행의 독립성은 매우 중요한 가치입니다."
- **기준금리가 일반 국민에게도 영향을 미치는가?**
  "통화량 조절 권한을 가진 한국은행이 정하는 기준금리는 국민생활 전반에 큰 영향을 미칩니다. 예금 금리, 대출 금리 등 일반적인 금융 거래에 사용되는 금리가 기준금리에 연동되기 때문에, 우리의 살림살이도 기준금리에 영향을 받게 됩니다. 은행에서 대출을 받은 사람은 기준금리 인하가 반가울 테고, 반대로 여유자금을 예금해 놓은 사람은 기준금리 인하가 달갑지 않겠지요."

기준금리 · 예금금리 추이 자료: 한국은행, 단위: 연 %



SUMMARY

- Money serves three functions:
  medium of exchange, unit of account, and store of value.
- There are two types of money:
  commodity money has intrinsic value; fiat money does not.
- In a fractional reserve banking system, banks create money when they make loans. Bank reserves have a multiplier effect on the money supply.
- Because banks are highly leveraged, a small change in the value of a bank's assets causes a large change in bank capital. To protect depositors from bank insolvency, regulators impose minimum capital requirements.
- The central bank is responsible for regulating the monetary system.
- The Fed controls the money supply mainly through open-market operations. Purchasing govt bonds increases the money supply, selling govt bonds decreases it.
- In recent years, the Fed has set monetary policy by choosing a target for the federal funds rate.