



ECON 354 Money and Banking

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Lecture 12

- Market for Reserves and Federal Funds Rate
- Effects of Policy Tools:
 - Open Market Operations
 - Discount Loans
 - Reserve Requirements



Big Concepts

- Market for Reserves:
 - Demand for reserves
 - Supply of reserves
- Determination of the Federal Funds Rate
- How changes in monetary policy instruments affect the interbank market.

Note: These lecture notes are incomplete without having attended lectures



Tools of Monetary Policy

- Open market operations
 - Affect the quantity of reserves and the monetary base
- Changes in borrowed reserves
 - Affect the monetary base
- Changes in reserve requirements
 - Affect the money multiplier
- Federal funds rate: the interest rate on overnight loans of reserves from one bank to another
 - Primary instrument of monetary policy

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Demand in the Market for Reserves

- What happens to the quantity of reserves demanded by banks, holding everything else constant, as the federal funds rate changes?
- Excess reserves are insurance against deposit outflows
 - The cost of holding these is the interest rate that could have been earned minus the interest rate that is paid on these reserves, i_{er}

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Demand in the Market for Reserves

- Since the fall of 2008 the Fed has paid interest on reserves at a level that is set at a fixed amount below the federal funds rate target.
- When the federal funds rate is above the rate paid on excess reserves, i_{er} , as the federal funds rate decreases, the opportunity cost of holding excess reserves falls and the quantity of reserves demanded rises
- Downward sloping demand curve that becomes flat (infinitely elastic) at i_{er}

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The Market for Reserves and the Federal Funds Rate

Demand Curve for Reserves

1. $R = RR + ER$
2. $i_{ff} \downarrow$, opportunity cost of $ER \downarrow$, $ER \uparrow$
3. Demand curve slopes down

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Supply in the Market for Reserves

- Two components: non-borrowed and borrowed reserves
- Cost of borrowing from the Fed is the discount rate
- Borrowing from the Fed is a substitute for borrowing from other banks
- If $i_{ff} < i_d$, then banks will not borrow from the Fed and borrowed reserves are zero
- The supply curve will be vertical
- As i_{ff} rises above i_d , banks will borrow more and more at i_d , and re-lend at i_{ff}
- The supply curve is horizontal (perfectly elastic) at i_d

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The Market for Reserves and the Federal Funds Rate

Supply Curve for Reserves

1. If i_{ff} is below i_d , then discount borrowing, $R^s = R_n$
2. Supply curve flat (infinitely elastic) at i_d because as i_{ff} starts to go above i_d , banks borrow more at i_d

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The Market for Reserves and the Federal Funds Rate

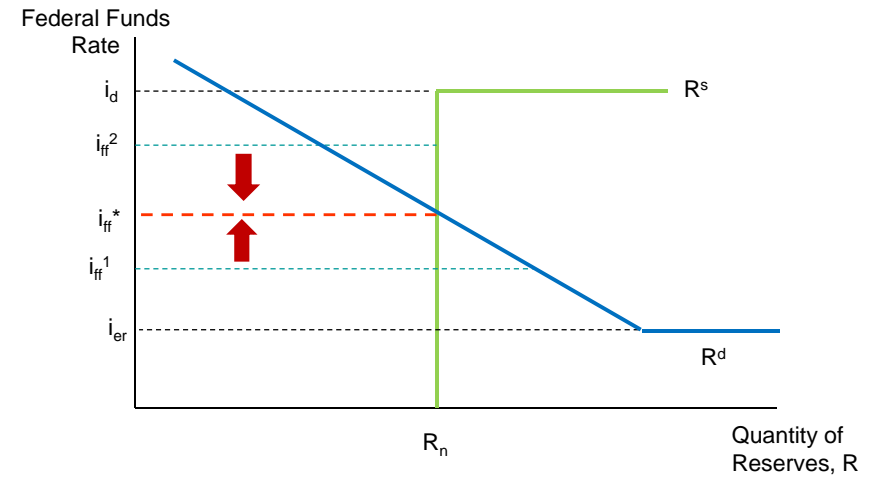
Market Equilibrium:

$$R^d = R^s \text{ at } i_{ff}^*$$

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Supply and Demand for Reserves



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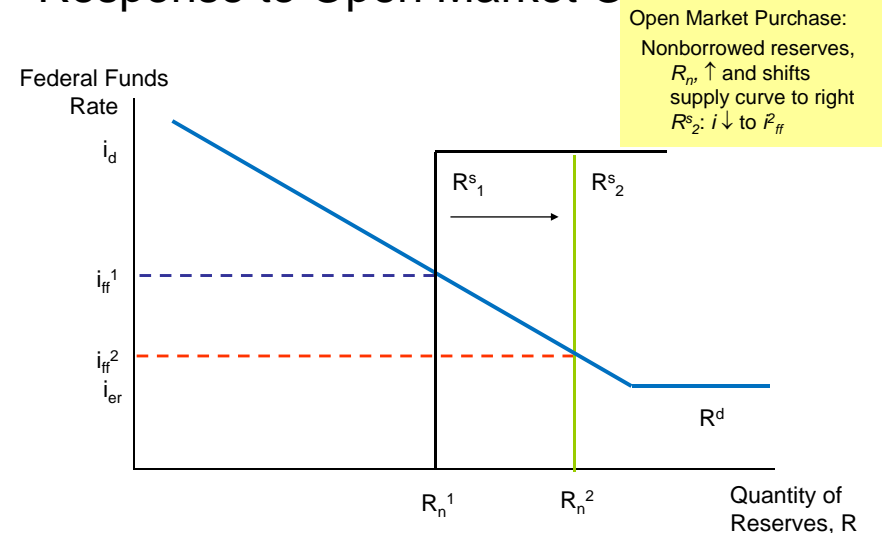
Affecting the Federal Funds Rate

- Effects of open an market operation depends on whether the supply curve initially intersects the demand curve in its downward sloped section versus its flat section.
- An open market purchase causes the federal funds rate to fall whereas an open market sale causes the federal funds rate to rise (when intersection occurs at the downward sloped section).
- Open market operations have no effect on the federal funds rate when intersection occurs at the flat section of the demand curve.

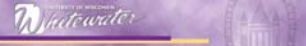
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Response to Open Market Operations

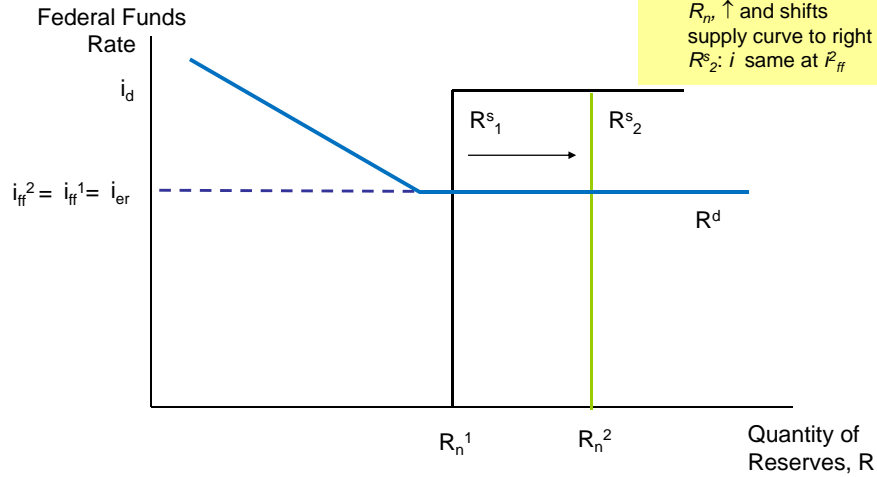


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Response to Open Market Operations

Open Market Purchase:
Nonborrowed reserves,
 $R_n \uparrow$ and shifts
supply curve to right
 R^{s_2} ; i same at i_{ff}^1



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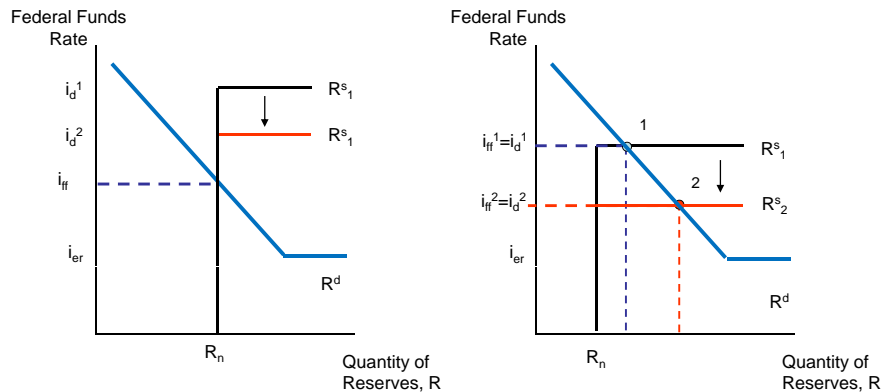
Affecting the Federal Funds Rate

- If the intersection of supply and demand occurs on the vertical section of the supply curve, a change in the discount rate will have no effect on the federal funds rate.
- If the intersection of supply and demand occurs on the horizontal section of the supply curve, a change in the discount rate shifts that portion of the supply curve and the federal funds rate may either rise or fall depending on the change in the discount rate

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Response To A Change In The Discount Rate



(a) No discount lending: **Lower Discount Rate**
Horizontal section \downarrow and supply curve just shortens, i_{ff} stays same

(b) Some discount lending: **Lower Discount Rate**
Horizontal section \downarrow , $i_{ff} \downarrow$ to $i_d^2 = i_{ff}^2$

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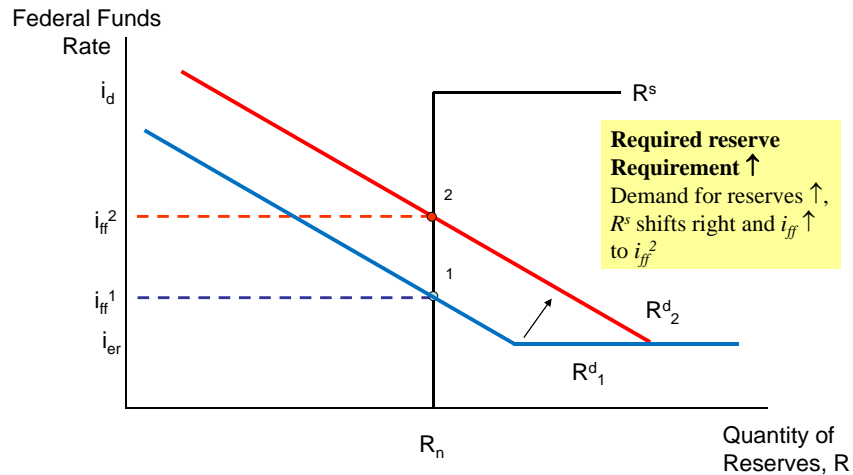


Affecting the Federal Funds Rate

- When the Fed raises reserve requirement, the federal funds rate rises and when the Fed decreases reserve requirement, the federal funds rate falls.

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Response To A Change In Required Reserves



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Problem

Questions:

1. Suppose that the Fed conducts an open market sale of government securities. Graphically show the effect of this OMO within the market for reserves.
2. What happens if the Open Market Sale is sufficiently large enough that there are now insufficient reserves in the interbank market to sustain the demand for reserves... what happens then?

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Open Market Operations

Two Types of Open Market Operations (OMO):

1. Dynamic:

- Meant to change MB

2. Defensive:

- Meant to offset other factors affecting MB, typically using **repo** (repurchase agreements) for a temporary OM purchase and a matched-sale purchase transaction (or **reverse repo**) for a temporary open market sale.

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Advantages of Open Market Operations

1. Fed has complete control
 - Fed completely controls the volume of transactions
2. Flexible and precise
3. Easily reversed
4. Implemented quickly

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Discount Loans

Three Types of Discount Loans

1. **Primary Credit/ Standing Lending Facility**
 - ❑ Healthy banks are allowed to borrow all they want from the primary credit facility
 - ❑ Interest rate on these loans is the discount rate, typically set at 100 basis points (1%) above the Fed Funds rate target.
2. **Secondary Credit**
 - ❑ Given to banks in financial trouble experiencing severe liquidity problems
 - ❑ Interest rate here is typically 50 basis points (0.5%) above the discount rate
3. **Seasonal Credit**
 - ❑ Given to limited number of small banks that have a seasonal pattern of deposits
 - ❑ Interest rate charged here is tied to the average of the Fed Funds rate and the CD rate

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Discount Loans

Lender of Last Resort Function:

1. To prevent banking panics

FDIC fund not big enough: Although FDIC insures depositors up to a limit of \$100,000 per account, the insurance funds are approx 1% of the deposits outstanding

Example: Continental Illinois

2. To prevent nonbank financial panics

Examples: 1987 stock market crash and September 11 terrorist incident

- Note: These create Moral Hazard problems

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Lender of Last Resort Function

Examples of Lender of Last Resort Function:

- Term Auction Facility (Dec. 2007)
 - Discount loans via competitive auctions
 - Less stigma for borrowing banks as compared to normal discount window facility.
- Term Securities Lending Facility (March 2008)
 - Lend Treasury securities to primary dealers for terms longer than overnight
 - Purpose was to supply more Treasury securities to primary dealers so that they had sufficient Treasury securities to act as collateral, thereby helping the orderly functioning of financial markets.

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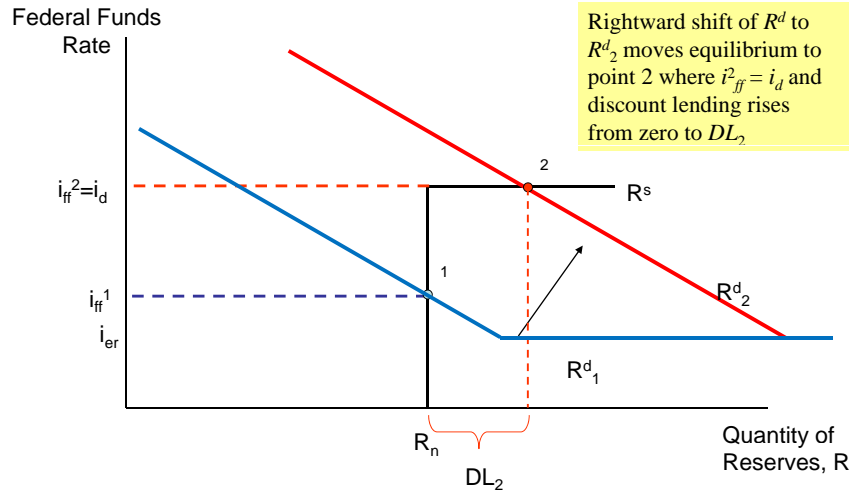
Lender of Last Resort Function

Examples of Lender of Last Resort Function:

- Section 13(3) of Federal Reserve Act: allows Fed to lend money to any individual, partnership or corporation, under “*unusual and exigent circumstances*” as long as certain requirements are met.
- Using these powers, the Fed established several temporary lending facilities:
 - Primary Dealer Credit Facility (March 2008)
 - Asset Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF, Sept. 2008)
 - Money Market Investor Funding Facility (MMIFF, October 2008)
 - Commercial Paper Funding Facility (CPFF, October 2008)

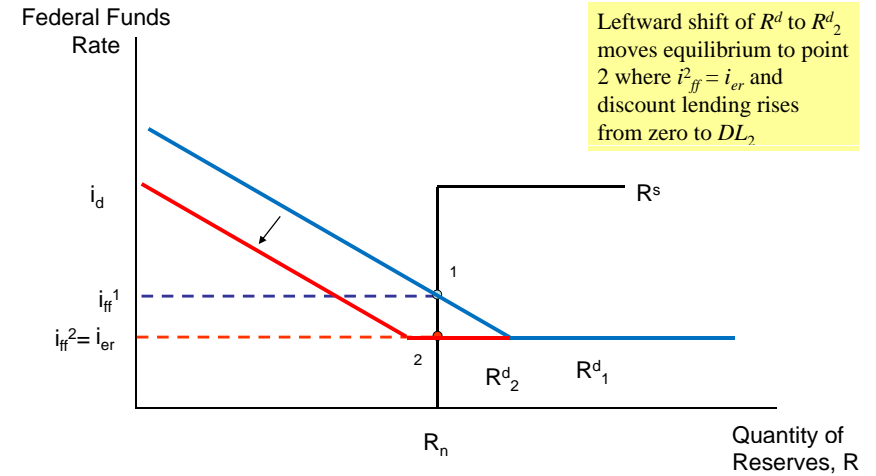
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How Primary Credit Facility Puts Ceiling on i_{ff}



Note: These lecture notes are incomplete without having attended lectures

How Interest on Excess Reserves Puts Floor on i_{ff}



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Advantages and Disadvantages of Discount Policy

- Used to perform role of lender of last resort function
 - Important during the subprime financial crisis of 2007-2008.
- Cannot be controlled by the Fed; the decision maker is the bank
- Discount facility is used as a backup facility to prevent the federal funds rate from rising too far above the target

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Reserve Requirements

- Depository Institutions Deregulation and Monetary Control Act of 1980 sets the reserve requirement the same for all depository institutions
- 3% of the first \$48.3 million of checkable deposits; 10% of checkable deposits over \$48.3 million
- The Fed can vary the 10% requirement between 8% to 14%

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Disadvantages of Reserve Requirements

- No longer binding for most banks, since most banks hold excess reserves
- Can cause liquidity problems
- Increases uncertainty for banks

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Monetary Policy Tools of the European Central Bank

- **Open market operations**
 - Main refinancing operations
 - Weekly reverse transactions
 - Longer-term refinancing operations
- **Lending to banks**
 - Marginal lending facility/marginal lending rate
 - Deposit facility

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Monetary Policy Tools of the European Central Bank (cont'd)

- **Reserve Requirements**
 - 2% of the total amount of checking deposits and other short-term deposits
 - Pays interest on those deposits so cost of complying is low

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