Monetary Theory and Policy

Chapter 15：Tools of Monetary Policy

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

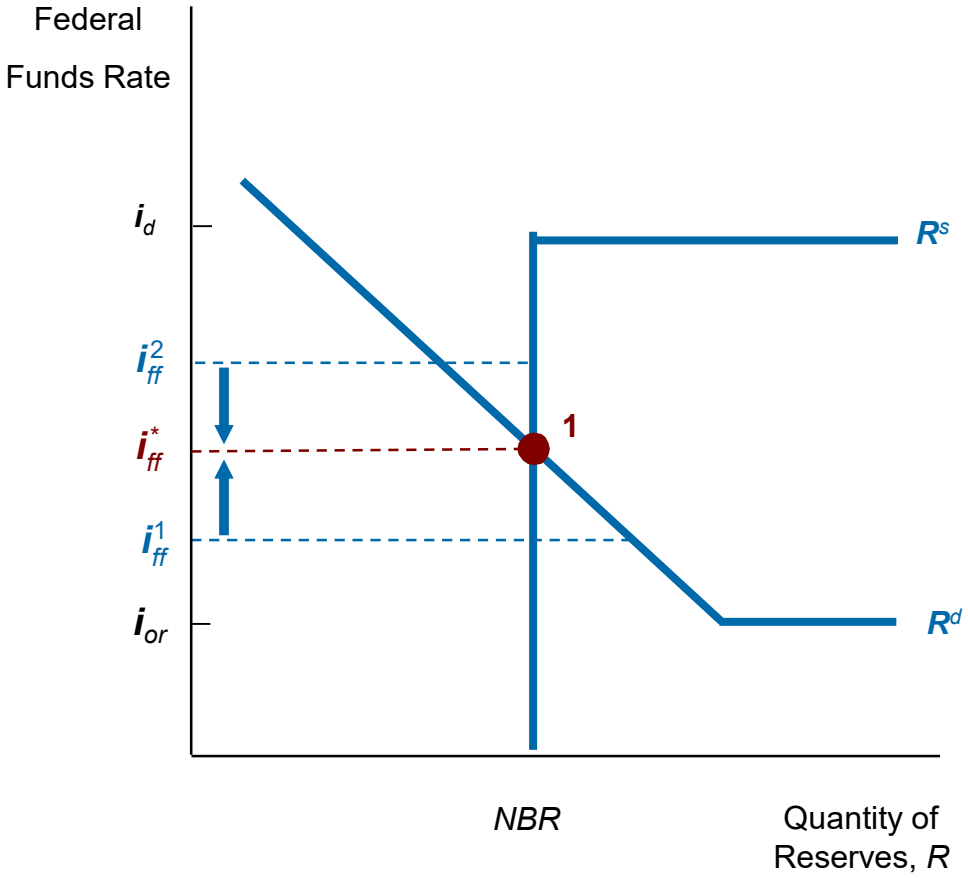
The Market For Reserves and the Federal Funds Rate

- 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}

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}

Figure 1 Equilibrium in the Market for Reserves



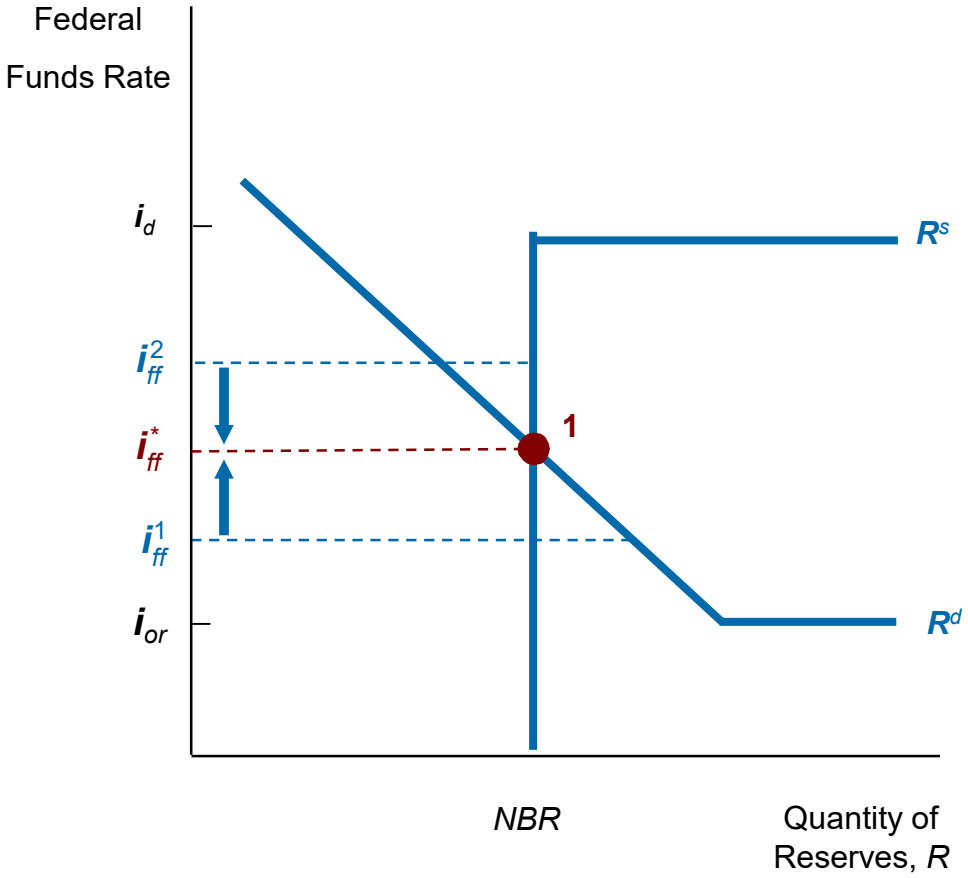
With excess supply of reserves, the federal funds rate falls to i_{ff}^*.

With excess demand for reserves, the federal funds rate rises to i_{ff}^*.

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

Figure 1 Equilibrium in the Market for Reserves



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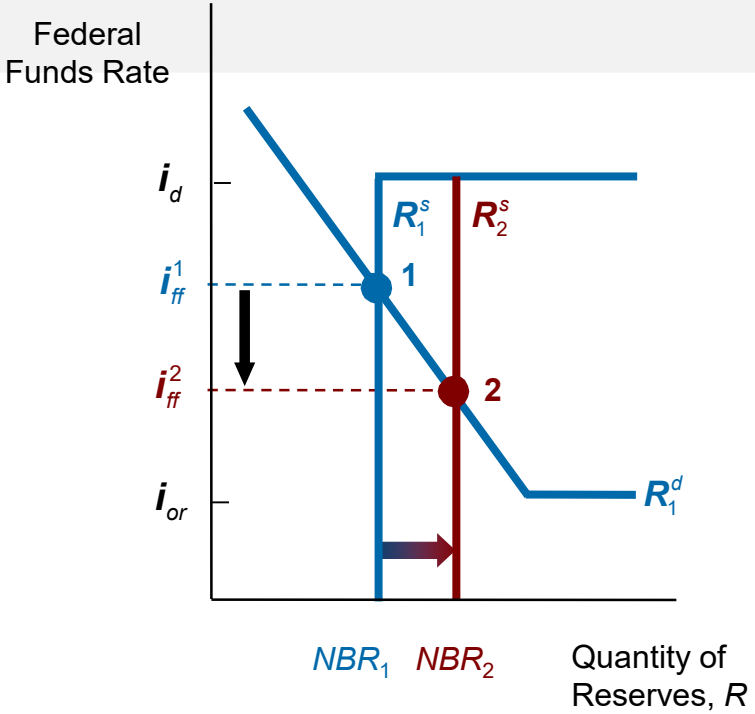
Affecting the Federal Funds Rate

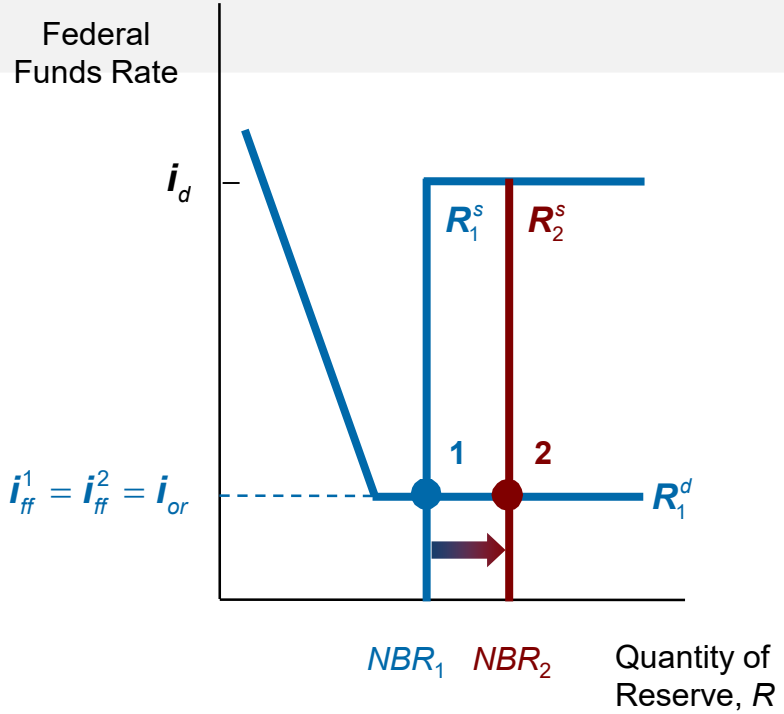
- Effects of an open market operation depends on whether the supply curve initially intersects the demand curve in its downward sloped section versus its flat section.
- An open market purchase causes the federal funds rate to fall whereas an open market sale causes the federal funds rate to rise (when intersection occurs at the downward sloped section).

Affecting the Federal Funds Rate (cont'd)

- Open market operations have no effect on the federal funds rate when intersection occurs at the flat section of the demand curve.

Figure 2 Response to an Open Market Operation





Step 1. An open market purchase shifts the supply curve to the right …

Step 2. causing the federal funds rate to fall.

(a) Supply curve initially intersects demand curve in its downward-sloping section

Step 1. An open market purchase shifts the supply curve to the right …

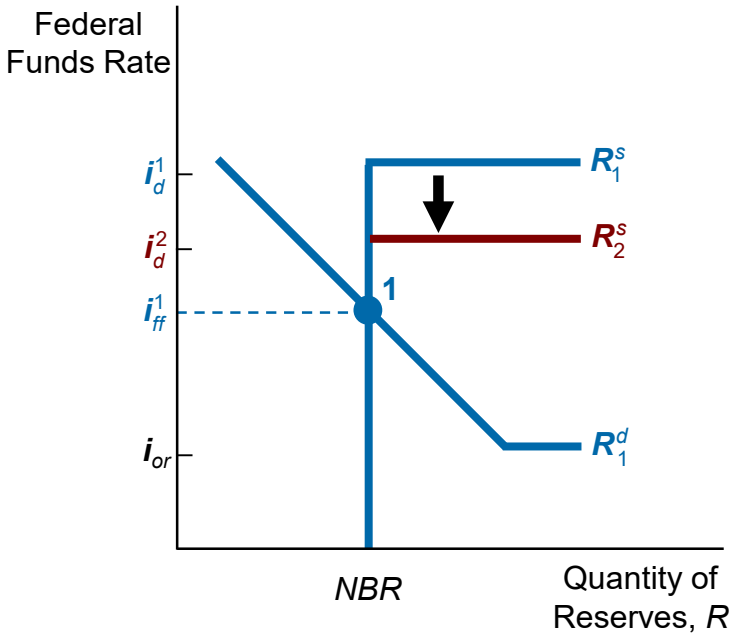
Step 2. but the federal funds rate cannot fall below the interest rate paid on reserves.

(b) Supply curve initially intersects demand curve in its flat section

Affecting the Federal Funds Rate (cont'd)

- 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.

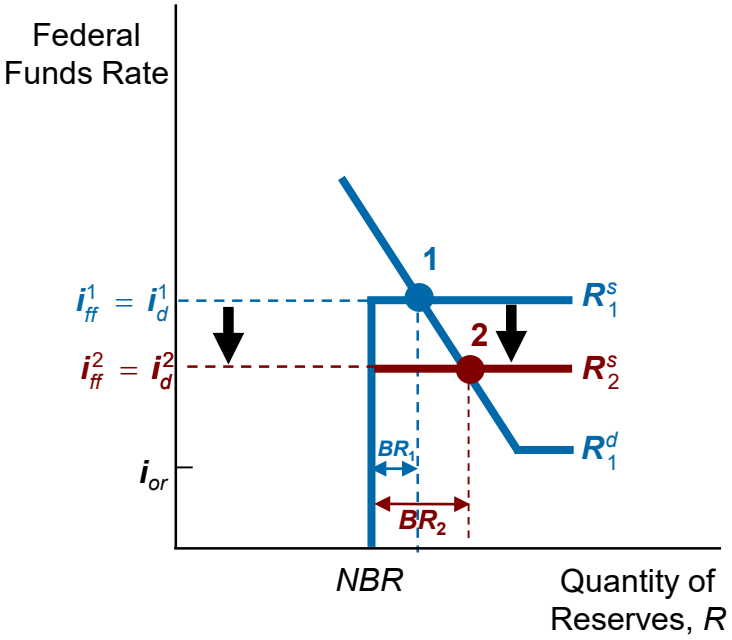
Figure 3 Response to a Change in the Discount Rate



Step 1. Lowering the discount rate shifts the supply curve down…

Step 2. but does not lower the federal funds rate.

(a) No discount lending (*BR* = 0)



Step 1. Lowering the discount rate shifts the supply curve down…

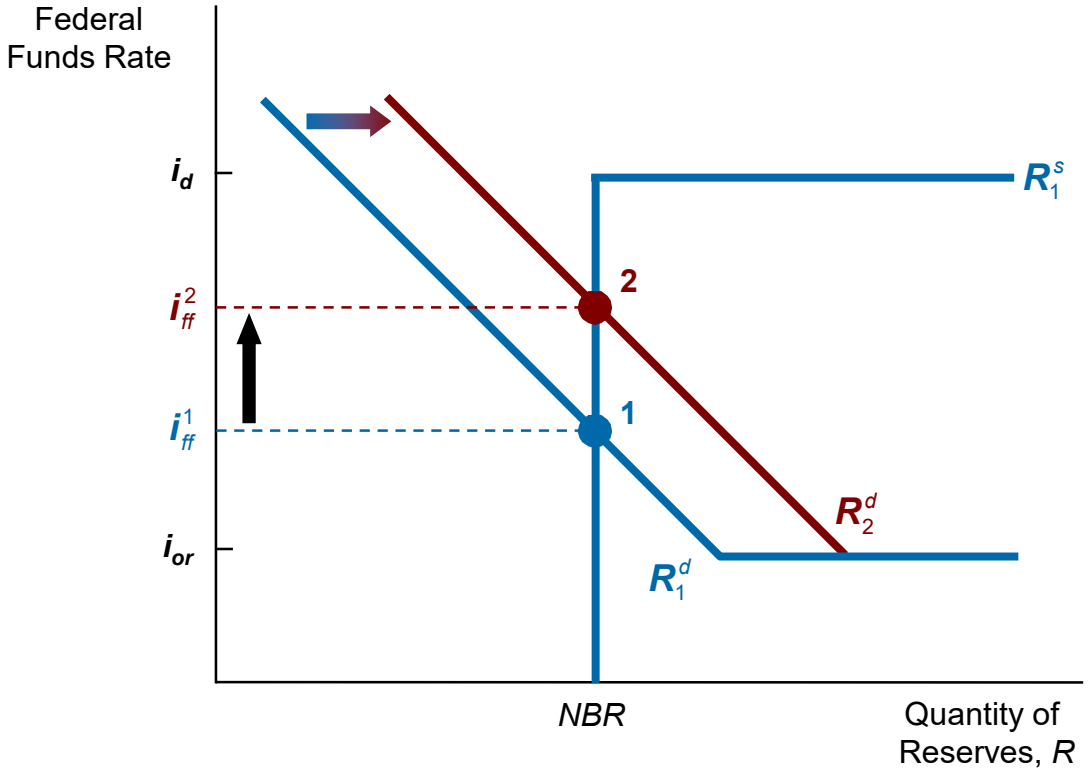
Step 2. and lowers the federal funds rate.

(b) Some discount lending (*BR* > 0)

Affecting the Federal Funds Rate (cont'd)

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

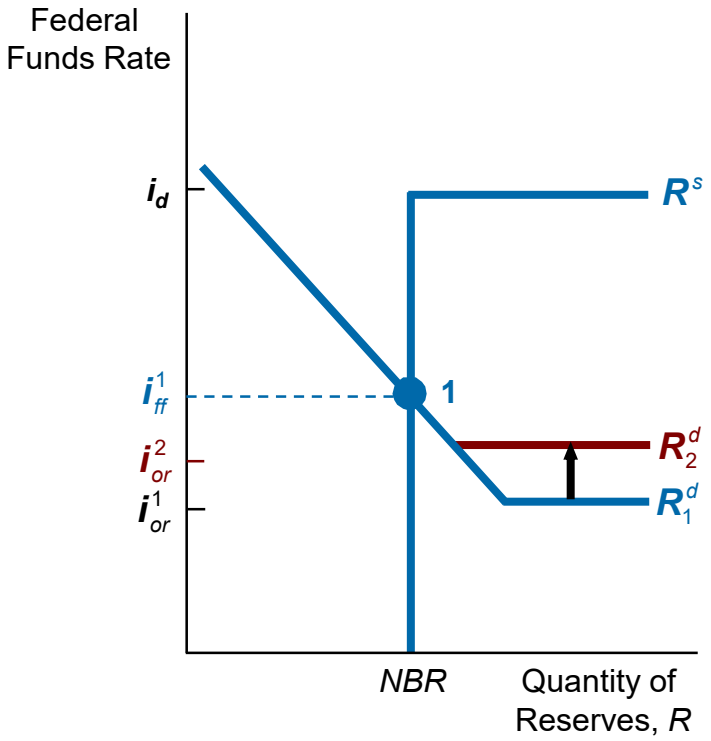
Figure 4 Response to a Change in Required Reserves



Step 1. Increasing the reserve requirement causes the demand curve to shift to the right . . .

Step 2. and the federal funds rate rises.

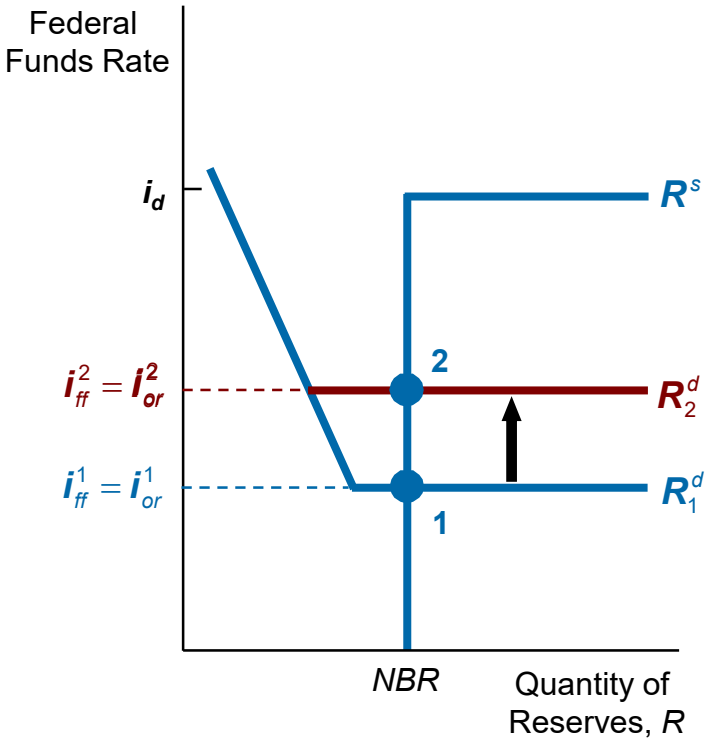
Figure 5 Response to a Change in the Interest Rate on Reserves



Step 1. A rise in the interest rate on reserves from i_{or}^1 to i_{or}^2 ...

Step 2. leaves the federal funds rate unchanged.

(a) initial $i_{ff}^1 > i_{or}^1$



Step 1. A rise in the interest rate on reserves from i_{or}^1 to i_{or}^2 ...

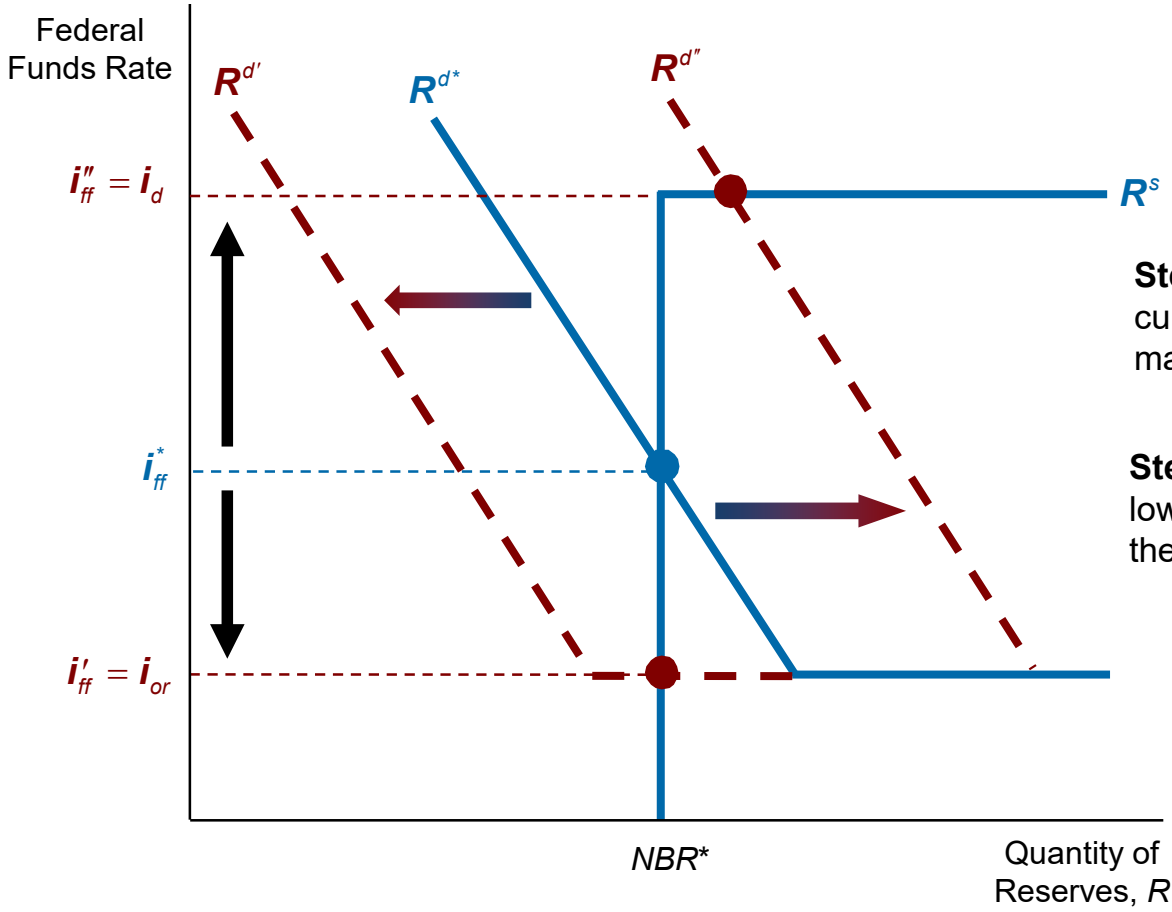
Step 2. raises the federal funds rate to $i_{ff}^2 = i_{or}^2$.

(b) initial $i_{ff}^1 = i_{or}^1$

Application: How the Federal Reserve Limits Fluctuations in the Federal Funds Rate

- Supply and demand analysis of the market for reserves illustrates how an important advantage of the Fed's current procedures for operating the discount window and paying interest on reserves is that they limit fluctuations in the federal funds rate.

Application: How the Federal Reserve Limits Fluctuations in the Federal Funds Rate



Step 1. A rightward shift of the demand curve raises the federal funds rate to a maximum of the discount rate.

Step 2. A leftward shift of the demand curve lowers the Ederal funds rate to a minimum of the interest rate on reserves.

Conventional Monetary Policy Tools

- During normal times, the Federal Reserve uses three tools of monetary policy—open market operations, discount lending, and reserve requirements—to control the money supply and interest rates, and these are referred to as conventional monetary policy tools.

Open Market Operations

- Dynamic open market operations
- Defensive open market operations
- Primary dealers
- TRAPS (Trading Room Automated Processing System)
- Repurchase agreements
- Matched sale-purchase agreements

Advantages of Open Market Operations

- The Fed has complete control over the volume
- Flexible and precise
- Easily reversed
- Quickly implemented

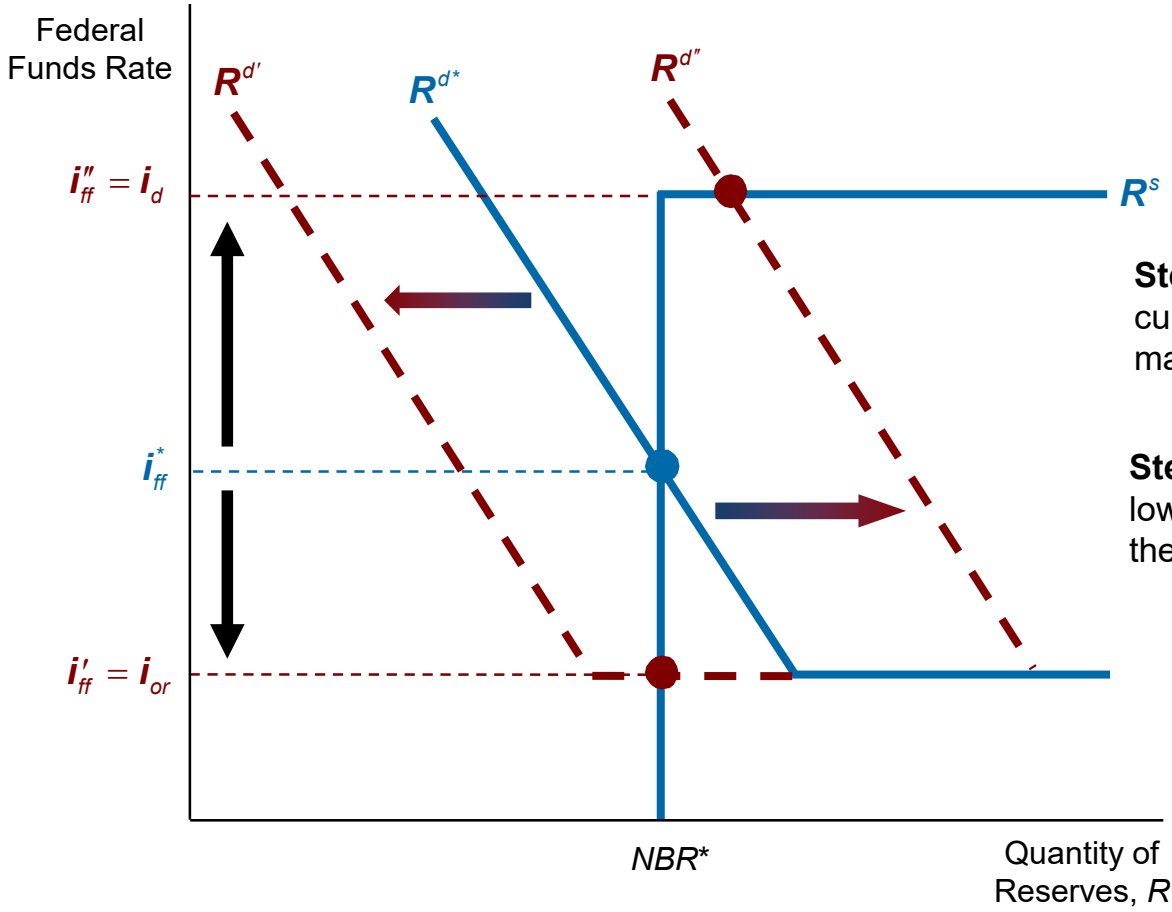
Discount Policy

- Discount window
- Primary credit: standing lending facility
- Secondary credit
- Seasonal credit
- Lender of last resort to prevent financial panics (FDIC)
  - Creates moral hazard problem

Advantages and Disadvantages of Discount Policy

- Used to perform role of lender of last resort
  - 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

Figure 6 How the Federal Reserve's Operating Procedures Limit Fluctuations in the Federal Funds Rate



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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%

Relative Advantages of the Different Monetary Policy Tools

- Open market operations are the dominant policy tool of the Fed since it has complete control over the volume of transactions, these operations are flexible and precise, easily reversed and can be quickly implemented.
- The discount window remains of tremendous value given its ability to allow the Fed to act as a lender of last resort.

Disadvantages of Reserve Requirements

- No longer binding for most banks
- Can cause liquidity problems
- Increases uncertainty for banks

On the Failure of Conventional Monetary Policy Tools in a Financial Panic

- When the economy experiences a full-scale financial crisis, conventional monetary policy tools cannot do the job, for two reasons.
- First, the financial system seizes up to such an extent that it becomes unable to allocate capital to productive uses, and so investment spending and the economy collapse.
- Second, the negative shock to the economy can lead to the zero-lower-bound problem.

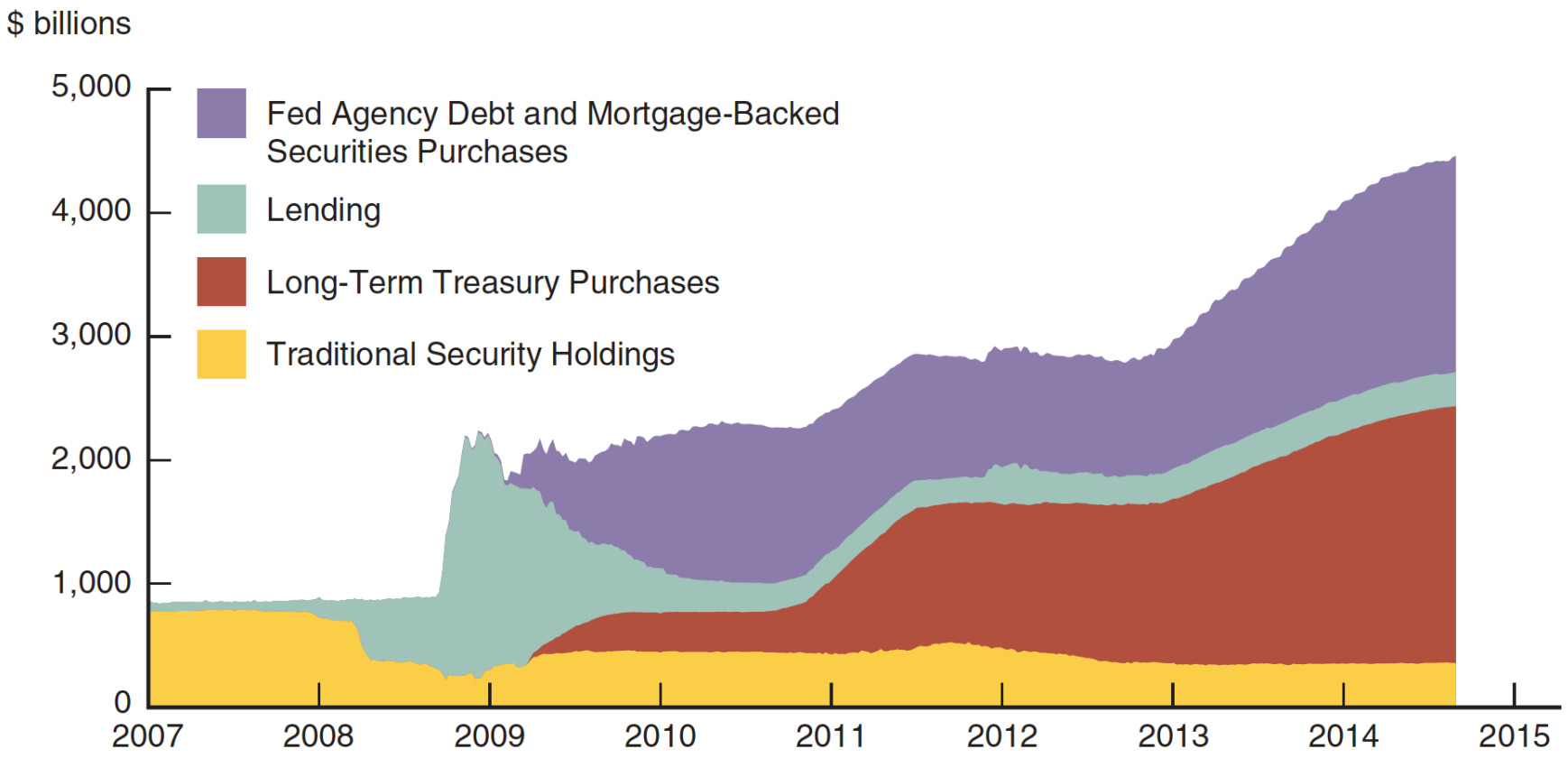
Nonconventional Monetary Policy Tools During the Global Financial Crisis

- Liquidity provision: The Federal Reserve implemented unprecedented increases in its lending facilities to provide liquidity to the financial markets
  - Discount Window Expansion
  - Term Auction Facility
  - New Lending Programs

Nonconventional Monetary Policy Tools During the Global Financial Crisis

- Large-scale asset purchases: During the crisis the Fed started three new asset purchase programs to lower interest rates for particular types of credit:
  - Government Sponsored Entities Purchase Program
  - QE2
  - QE3

Figure 7 The Expansion of the Federal Balance Sheet, 2007-2014



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

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