

● ● ● | Money Market

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● ● ● | Outline

- Introduction
- Money market instruments
- Valuation
- Yield calculation
- Market analysis

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● ● ● | Introduction

- Definition of money market.
- Why we need money market?

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## Money Market Instruments: Treasury Bills

- T-bills issued by Treasury department, have 28-day, 91-day(13-week), 182-day(26-week) or 12 month maturities.
- T-bills are zero-coupon debt securities sold at discount
- Yield and discount rate of T-bills
- Pricing of T-bills
- Auction of T-bills (primary market)
- Secondary market

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## Money Market Instruments: Treasury Bill Auctions Example

The Treasury auctioned \$2.5 billion par value 91-day T-bills, the following bids were received:

Bidder	Bid Amount	Bid Price
1	\$500 million	\$0.9940
2	\$750 million	\$0.9901
3	\$1.5 billion	\$0.9925
4	\$1 billion	\$0.9936
5	\$600 million	\$0.9939

The Treasury also received \$750 million in noncompetitive bids. Who will receive T-bills, what quantity, and at what price?

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## Money Market Instruments: Treasury Bill Auctions Example

The Treasury accepts the following bids:

Bidder	Bid Amount	Bid Price
1	\$500 million	\$0.9940
5	\$600 million	\$0.9939
4	\$650 million	\$0.9936

only noncompetitive bidders pay the weighted-average price:

$$\$0.9938 = ( 500 \times 0.9940 + 600 \times 0.9939 + 650 \times 0.9936 ) / 1,750$$

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## Money Market Instruments: Treasury Bill Auctions

- How the auction works?
  - Announcement (<http://www.savingsbonds.gov/RI/OFAnnce>)
  - Bidding
    - Competitive bidding, limited to 35% of the issue amount for each bidder.
    - Noncompetitive bidding, limited to purchases of \$5 million for U.S. Treasury bills.
  - Issuance
- How often is the auction?
- Recent auction results:  
<http://www.savingsbonds.gov/RI/OFBills>

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## Secondary market

- OTC market
  - Dealers
  - Bid-ask prices
- Dealers:  
[http://www.ny.frb.org/markets/pridealers\\_current.html](http://www.ny.frb.org/markets/pridealers_current.html)

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## Money Market Instruments: Fed Funds

- Short-term funds transferred (loaned or borrowed) between financial institutions, usually for a period of one day.
- Used by banks to meet short-term needs to meet reserve requirements.
- How interest rate is determined?
- How FED affects the rate?

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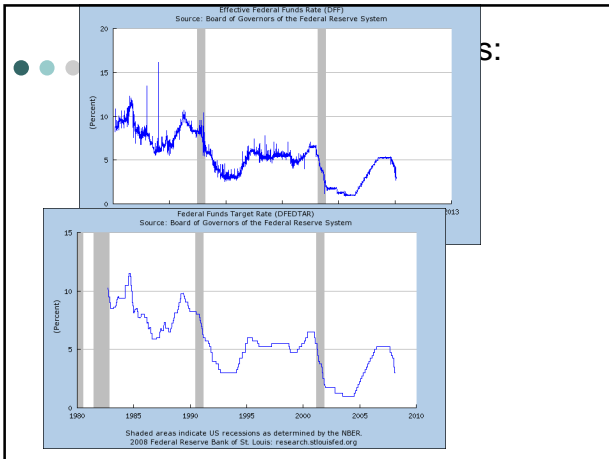
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### Money Market Instruments: Repurchase Agreements

- What is repo?
- Why the repo is needed?
- How to calculate repo rate?
- Market structure
- Application of monetary policy

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### Repo rate

- An investor initially purchased securities at a price of  $P$  and will sell it back to the firm at price  $F$ ,  $T$  days later. What is yield rate for the investor? What is repo cost for the borrower?

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## Money Market Instruments: Commercial Paper

- Unsecured promissory notes, issued by corporations, that mature in no more than 270 days.
- It is usually issued at a discount

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## Money Market Instruments: Commercial Paper Rates

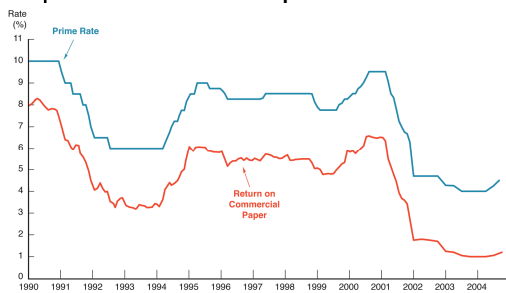


Figure 9.4 Return on Commercial Paper and the Prime Rate, 1990–January 2004

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## Money Market Instruments: Commercial Paper Volume

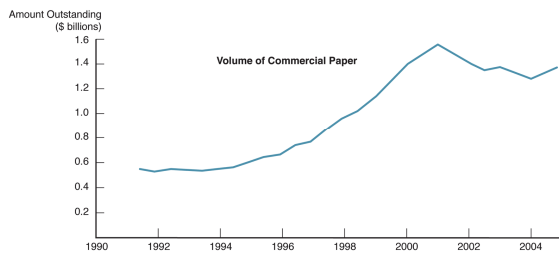


Figure 9.5 Volume of Commercial Paper Outstanding

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● ● ● Money Market Instruments:  
Negotiable Certificates of  
Deposit

- A bank-issued security that documents a deposit and specifies the interest rate and the maturity date
- Denominations range from \$100,000 to \$10 million
- Differences between regular CDs and NCDs

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● ● ● Money Market Instruments:  
Banker's Acceptances

- Origination
- Definition: An order to pay a specified amount to the bearer on a given date if specified conditions have been met, usually delivery of promised goods.
- Process
- Maturity and Rate
- Advantages

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● ● ● Money Market Instruments:  
Eurodollars

- Eurodollars represent Dollar denominated deposits held in foreign banks, mainly in London.
- Started from 1950s and 1960s, received a major boost after 1973-4 oil crisis.

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## Money Market Instruments: Eurodollars

- Competitive advantage of Eurodollar market:
  - not subject to the same regulations restricting U.S. banks 1) reserve requirement, 2) interest rate restrictions
  - Consequences: 1) banks in Eurodollar market can lend out more loan, 2) higher interest rate, 3) narrower spread.

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## Eurodollar market

- Players: major American, German and Swiss banks. In London, Citigroup, Deutsche Bank and Union Bank of Switzerland.
- Market structure: over-counter dealership market. major banks are also major dealers. quote bid (borrow) offer (lend) rates
- Instruments: term deposits less than one year

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## Money Market Instruments: Eurodollars Rates

- London interbank bid rate (LIBID)
  - The rate paid by banks buying funds
- London interbank offer rate (LIBOR)
  - The rate offered for sale of the funds
- Time deposits with fixed maturities
  - Largest short term security in the world

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## Application of LIBOR

- Syndicated Loan: A very large loan in which a group of banks work together to provide funds for one borrower. The loans-usually made at interest rates tied to a variable rate index
- **ADB's LIBOR-Based Loan**
- **Eloan's ARMs:**

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