中南财经政法大学

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Financial Markets

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Chapter 11: The Money Markets

Chapter Preview

- In this chapter, we review the money markets and the securities that are traded there. In addition, we discuss why the money markets are important in our financial system. Topics include:
  - The Money Markets Defined
  - The Purpose of Money Markets
  - Who Participates in Money Markets?
  - Money Market Instruments
  - Comparing Money Market Securities

The Money Markets Defined

The term “money market” is a misnomer. Money (currency) is not actually traded in the money markets.

However, the securities traded in this market are short term with high liquidity; therefore, they are close to being money.

Securities in Money Markets have three basic characteristics in common:

1. Money market securities are usually sold in large denominations ($1,000,000 or more)
2. They have low default risk
3. They mature in one year or less from their issue date, although most mature in less than 120 days

Why Do We Need Money Markets?

In theory, the banking industry should handle the needs for short-term loans and accept short-term deposits. Banks also have an information advantage on the credit-worthiness of participants.

However, banks are heavily regulated, which creates a distinct cost advantage for money markets over banks.

In situations where the asymmetric information problem is not severe, the money markets have a distinct cost advantage over banks in providing short-term funds.

The Money Markets Defined: Cost Advantages

- Reserve requirements create additional expense for banks that money markets do not have

- Regulations on the level of interest banks could offer depositors lead to a significant growth in money markets, especially in the 1970s and 1980s. When interest rates rose, depositors moved their money from banks to money markets to earn a higher interest rate

- Even today, the cost structure of banks limits their competitiveness to situations where their informational advantages outweighs their regulatory costs

The Money Markets Defined: Cost Advantages

Figure shows that limits on interest banks could offer was not relevant until the 1950s. But in the decades that followed, the problem became apparent.

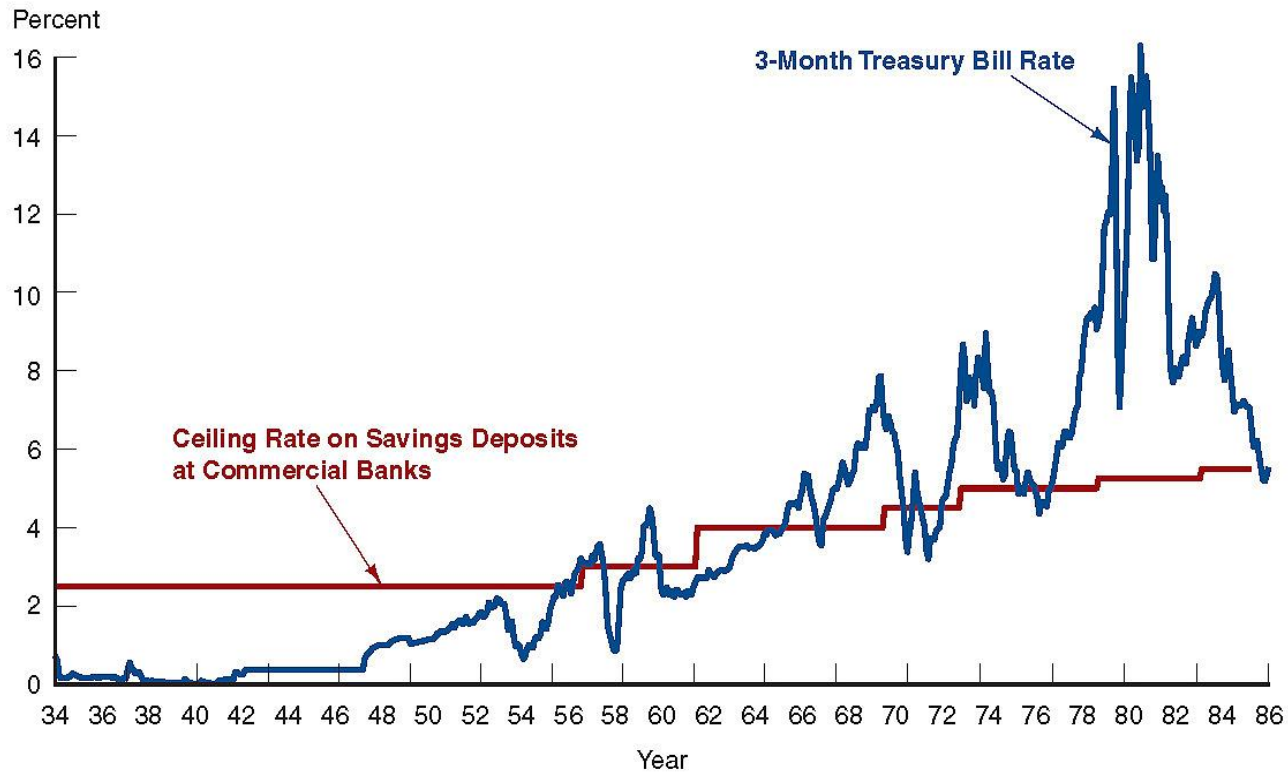


FIGURE 11.1 3-Month Treasury Bill Rate and Ceiling Rate on Savings Deposits at Commercial Banks

Source: http://www.stlouisfed.org/default.cfm.

The Purpose of Money Markets

- Investors/Lenders in Money Market: Provides a place for warehousing surplus funds for short periods of time
  - ➢to act quickly to take advantage of investment opportunities
  - ➢to meet investment or deposit outflows

- Borrowers from Money Market: provides low-cost source of temporary funds.
  - ➢For corporations and governments, cash inflow and outflow are rarely synchronized. The money markets provide an efficient, low-cost way of solving these cash-timing problem.

Who Participates in the Money Markets?

Before we discuss, in turn, each of the major borrowers and lenders in the money market, let's examine some of the current rates offered in the U.S. money markets.

TABLE 11.1 Sample Money Market Rates, April 8, 2010

Instrument	Interest Rate (%)
Prime rate	3.25
Federal funds	0.19
Commercial paper	0.23
1 month CDs (secondary market)	0.23
London interbank offer rate	0.45
Eurodollar	0.30
Treasury bills (4 week)	0.16

Source: Federal Reserve Statistical Bulletin, Table H15, April 9, 2010.

Who Participates in the Money Markets?

TABLE 11.2 Money Market Participants

Participant	Role
U.S. Treasury Department	Sells U.S. Treasury securities to fund the national debt
Federal Reserve System	Buys and sells U.S. Treasury securities as its primary method of controlling the money supply
Commercial banks	Buy U.S. Treasury securities; sell certificates of deposit and make short-term loans; offer individual investors accounts that invest in money market securities
Businesses	Buy and sell various short-term securities as a regular part of their cash management
Investment companies (brokerage firms)	Trade on behalf of commercial accounts
Finance companies (commercial leasing companies)	Lend funds to individuals
Insurance companies (property and casualty insurance companies)	Maintain liquidity needed to meet unexpected demands
Pension funds	Maintain funds in money market instruments in readiness for investment in stocks and bonds
Individuals	Buy money market mutual funds
Money market mutual funds	Allow small investors to participate in the money market by aggregating their funds to invest in large-denomination money market securities

Money Market Instruments

- We will examine each of these in the following slides:

1) Treasury Bills
2) Federal Funds
3) Repurchase Agreements
4) Negotiable Certificates of Deposit
5) Commercial Paper
6) Eurodollars
7) Banker’s Acceptance

Money Market Instruments: Treasury Bills

- T-bills have 28-day maturities through 12- month maturities.

- **Discounting:** When an investor pays less for the security than it will be worth when it matures, and the increase in price provides a return. This is common to short-term securities because they often mature before the issuer can mail out interest checks.

Money Market Instruments: Treasury Bills Discounting Example

You pay $996.37 for a 28-day T-bill. It is worth $1,000 at maturity. What is its discount rate?

$$i_{discount} = \frac{F - P}{F} \times \frac{360}{n}$$

$$i_{discount} = \frac{1{,}000 - 996.73}{1{,}000} \times \frac{360}{28} = 4.665\%$$

Money Market Instruments: Treasury Bills Discounting Example

You pay $996.37 for a 28-day T-bill. It is worth $1,000 at maturity. What is its annualized yield?

$$i_{yt} = \frac{F - P}{P} \times \frac{365}{n}$$

$$i_{yt} = \frac{1{,}000 - 996.73}{996.73} \times \frac{365}{28} = 4.76\%$$

$$i_{discount} = \frac{1{,}000 - 996.73}{1{,}000} \times \frac{360}{28} = 4.665\%$$

Money Market Instruments: Treasury Bill Risk & Auctions

- Risk
  - Treasury bills have virtually zero default risk because even if the government ran out of money, it could simply print more to redeem them when they mature.
  - The risk of unexpected changes in inflation is also low because of the short term to maturity.

- Auction
  - T-bills are auctioned to the dealers every Thursday.
  - The Treasury may accept both *competitive* and *noncompetitive* bids.
  - The price everyone pays is the highest yield paid to any accepted bid.

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

- Meanwhile, the Treasury also received $750 million in noncompetitive bids.

- Who will receive T-bills, what quantity, and at what price?

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

- Both the competitive and noncompetitive bidders pay the highest yield—based on the price of 0.9936:

Money Market Instruments: Treasury Bill Rates

Notice that the inflation rate *exceeds* the rate on T-bills in several on the years. This indicates a *negative* real return for T-bill investors during these periods.

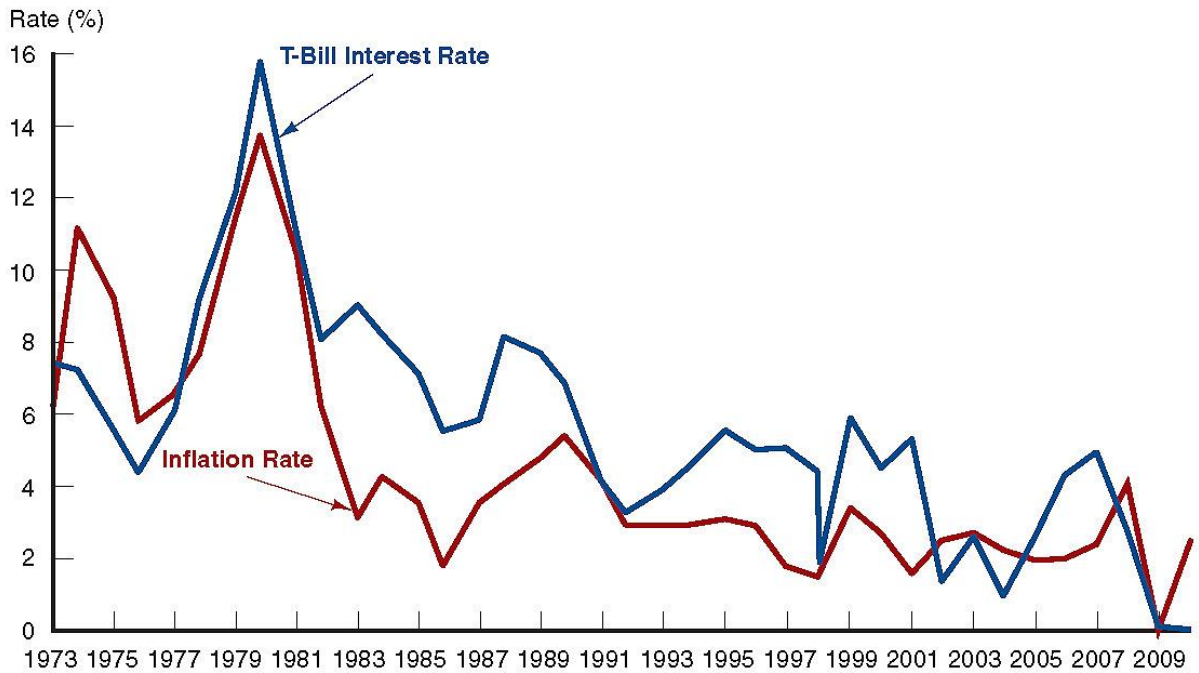


FIGURE 11.2 Treasury Bill Interest Rate and the Inflation Rate, January 1973–January 2010

Source: ftp://ftp.bls.gov/special.requests/cpi/cpiai.txt.

Money Market Instruments: Fed Funds

- Short-term funds transferred (loaned or borrowed) between financial institutions, usually for a period of one day.

- Fed funds have nothing to do with the federal government. The term comes from the fact that these funds are held at the Federal Reserve bank.

- Used by banks to meet short-term needs to meet reserve requirements.

Money Market Instruments: Fed Funds Rates

Figure shows actual fed funds rates and T-bill rates 1990 through 2010. Notice that the two rates track fairly closely.

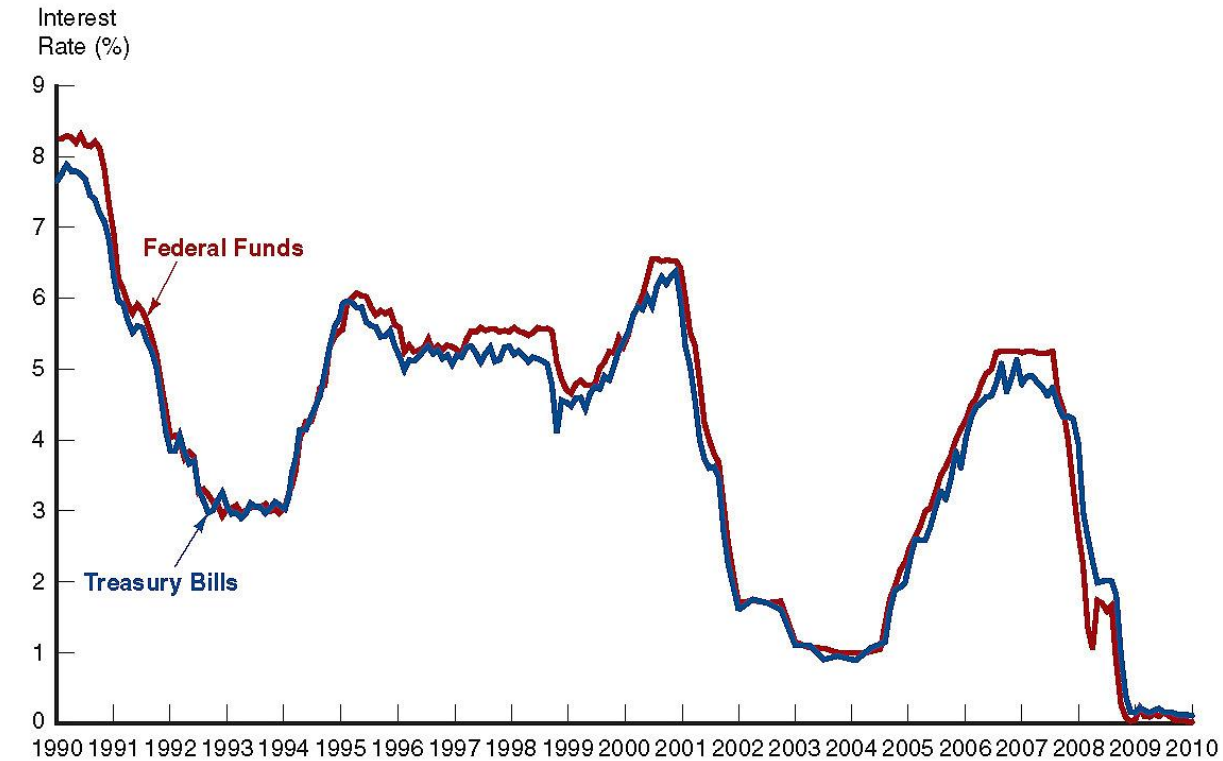


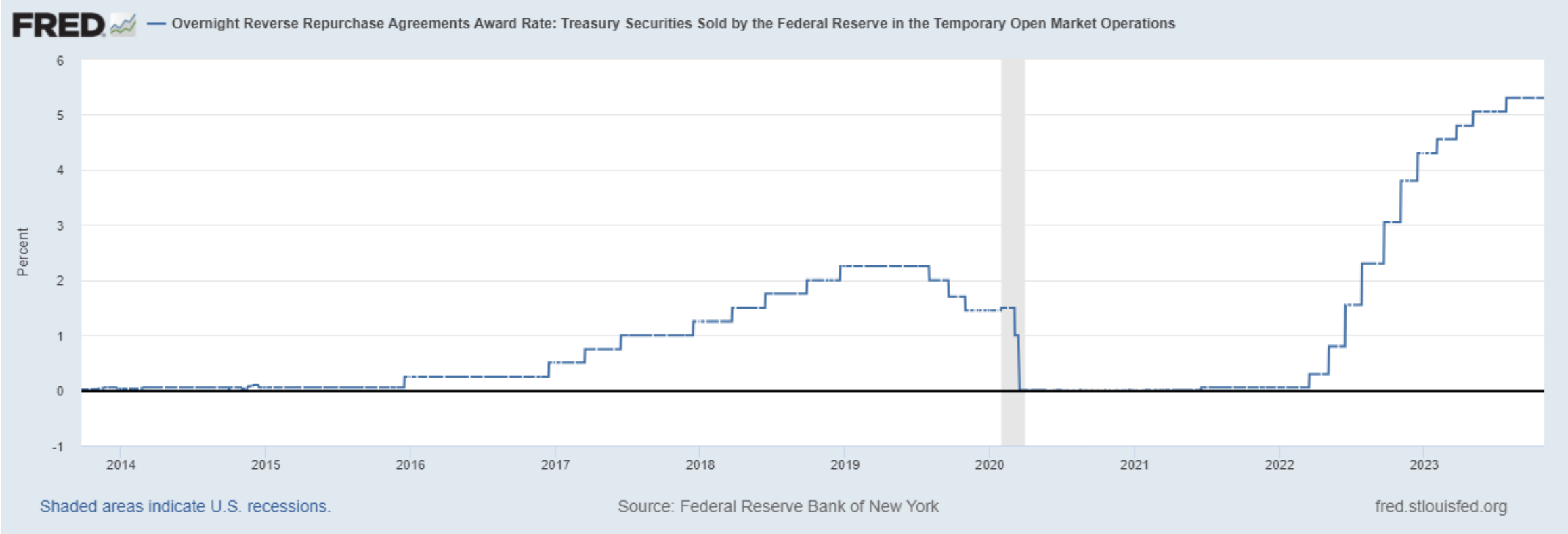
FIGURE 11.3 Federal Funds and Treasury Bill Interest Rates, January 1990–January 2010

Source: http://www.federalreserve.gov/releases/H15/data.htm/.

Money Market Instruments: Repurchase Agreements (repo)

- Repurchase agreements work similar to fed funds, but nonbanks can participate.
- A firm sells Treasury securities, but agrees to buy them back at a certain date (usually 3–14 days later) for a certain price.
- A repo agreements is essentially a short-term collateralized loan.
- Repos are also used by the Fed to conduct its monetary policy, whereby the Fed purchases/sells Treasury securities in the repo market.

U.S. Overnight Repo Rate



Why did repo rates spike in 2019?

Money Market Instruments: Negotiable Certificates of Deposit

- A negotiable certificate of deposit is 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

- The rates paid on negotiable CDs are negotiated between the bank and the customer.

Money Market Instruments: Negotiable Certificates of Deposit

Figure shows actual CD rates and T-bill rates 1990 through 2010. Again, notice that the two rates track fairly closely.

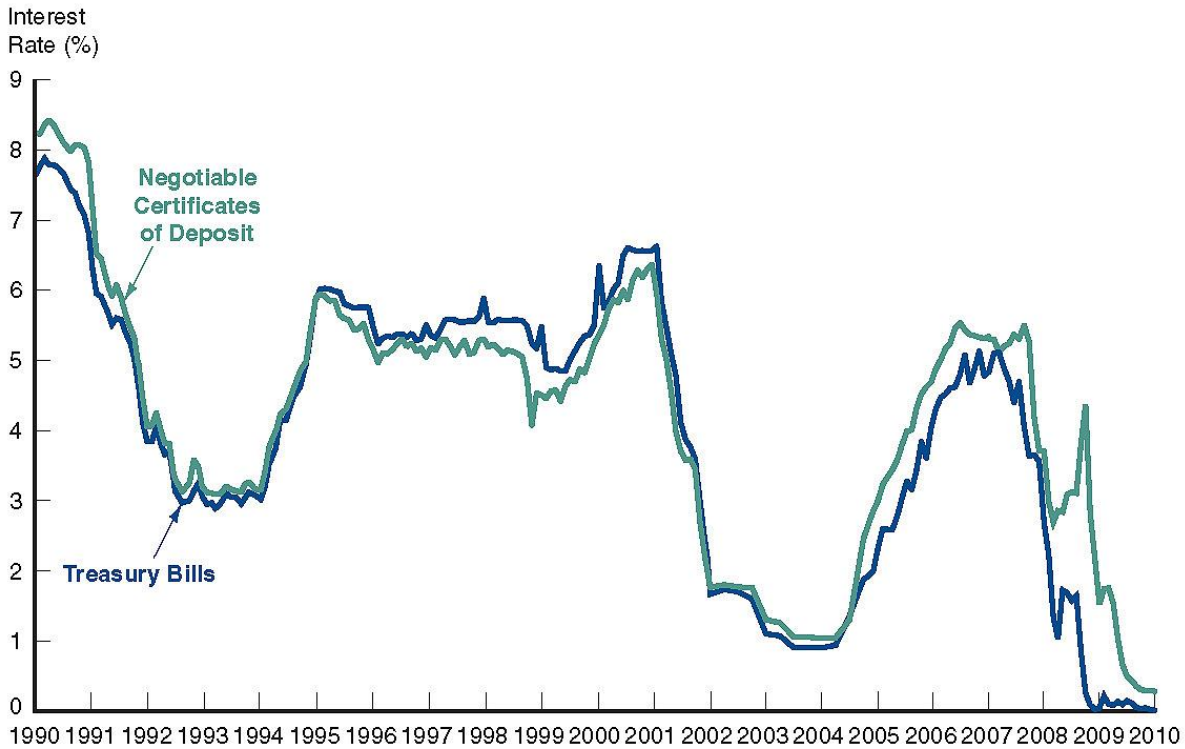


FIGURE 11.4 Interest Rates on Negotiable Certificates of Deposit and on Treasury Bills, January 1990–January 2010

Source: http://www.federalreserve.gov/releases.

Money Market Instruments: Commercial Paper

- Commercial paper securities are unsecured promissory notes, issued by corporations, that mature in no more than 270 days.
- Like T-bills, most commercial paper is issued on a discounted basis.
- The use of commercial paper increased significantly in the early 1980s because of the rising cost of bank loans.
- Most issuers of commercial paper back up their paper with a line of credit at a bank. And the bank charges a fee (0.5% - 1%) for this commitment.
- Asset-backed commercial papers (ABCP) during the financial crisis in 2008.

Money Market Instruments: Commercial Paper

Figure shows actual commercial paper rates and the prime rates 1990 through 2010. Although the two track closely in terms of movements, notice that difference between the two remains roughly 200 basis points.

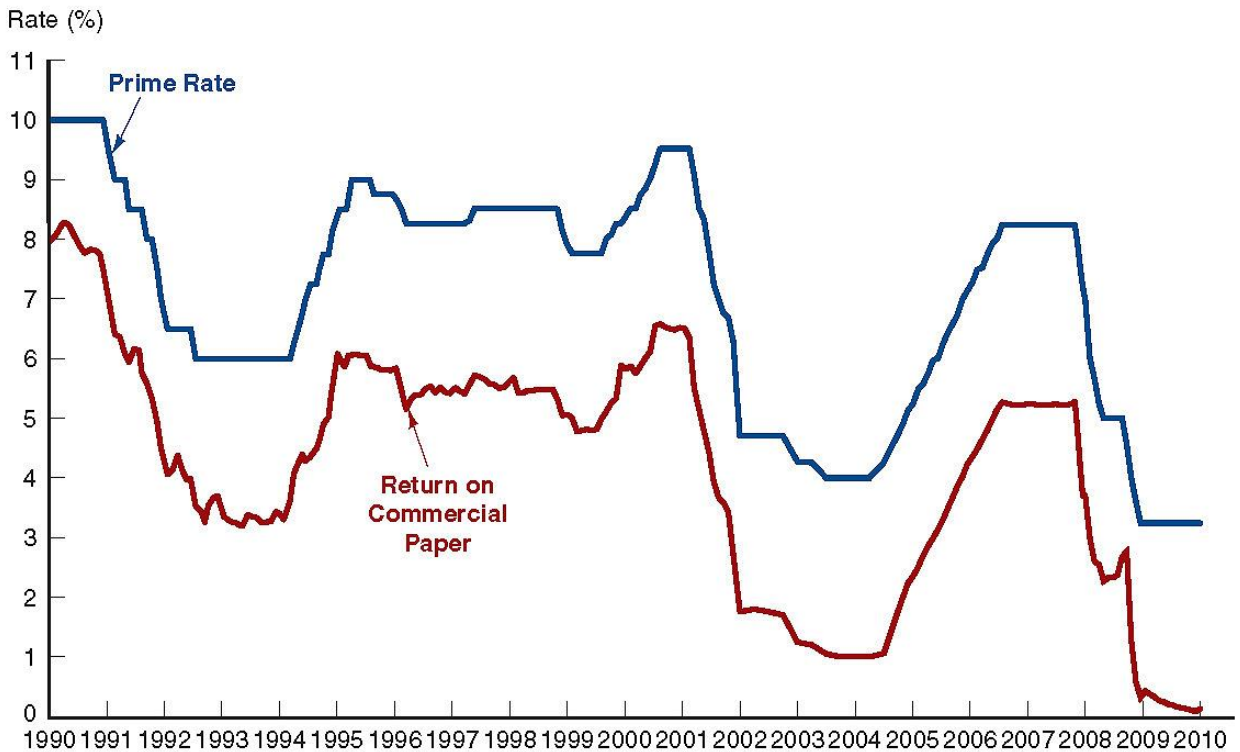


FIGURE 11.5 Return on Commercial Paper and the Prime Rate, 1990–2010

Source: http://www.federalreserve.gov/releases.

Money Market Instruments: Commercial Paper

Figure shows actual commercial paper volume by year from 1990 through 2010. Notice that the volume fell significantly during the recent economic recession. Even so, the annual market is still quite large, at well over $1.5 trillion outstanding.

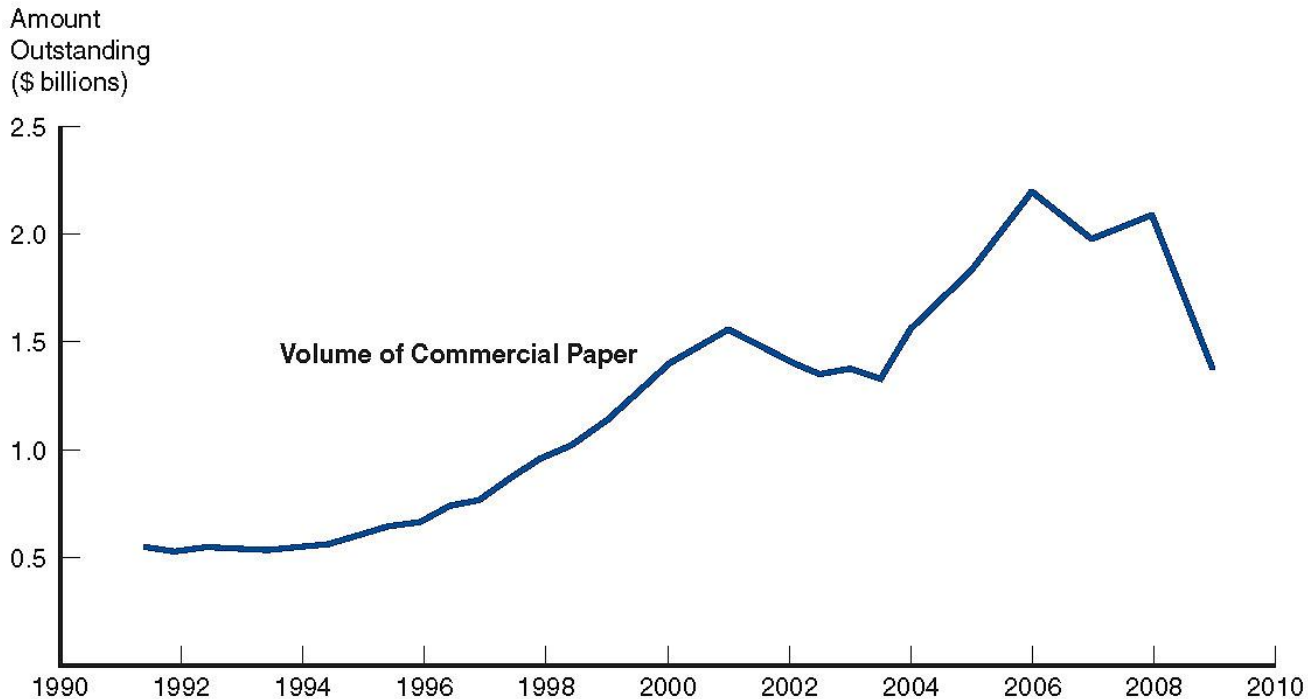


FIGURE 11.6 Volume of Commercial Paper Outstanding

Source: http://www.federalreserve.gov/releases/cp/histouts.txt.

Money Market Instruments: Banker's Acceptances

- A banker's acceptance is 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.

- These are often used when buyers / sellers of expensive goods live in different countries.
  - Exporter paid immediately
  - Exporter shielded from foreign exchange risk
  - Exporter does not have to assess the financial security of the importer
  - Importer's bank guarantees payment
  - Crucial to international trade

Money Market Instruments: Eurodollars

- Eurodollars represent Dollar denominated deposits held in foreign banks.

- The market is essential since many foreign contracts call for payment is U.S. dollars due to the stability of the dollar, relative to other currencies.

- The Eurodollar market has continued to grow rapidly because depositors receive a higher rate of return on a dollar deposit in the Eurodollar market than in the domestic market.

- Multinational banks are not subject to the same regulations restricting U.S. banks and because they are willing to accept narrower spreads between the interest paid on deposits and the interest earned on loans.

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

The overnight LIBOR and the fed funds rate tend to be very close to each other. This is because they are near-perfect substitutes.

Comparing Money Market Securities : A comparison of rates

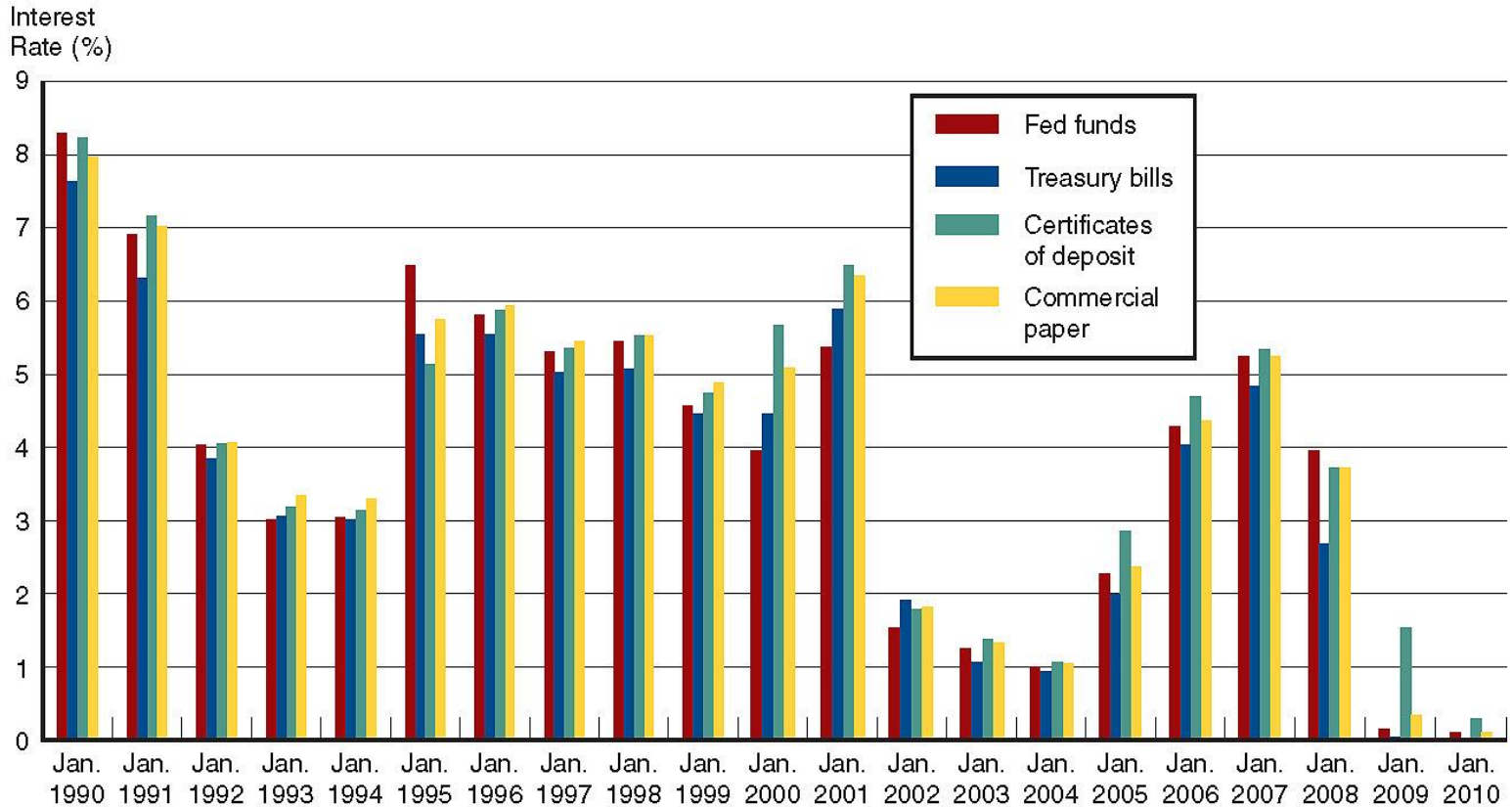


FIGURE 11.7 Interest Rates on Money Market Securities, 1990–2010

Source: http://www.federalreserve.gov/releases.

Comparing Money Market Securities

- Typically, the depth of the the secondary market where the security can be resold determines it liquidity.

- In some way, the depth of the secondary market is not as critical for money market securities as it is for long-term securities such as stocks and bonds. This is because money market securities are short-term to start with.

- However, many investors desire liquidity intervention: they seek an intermediary to provide liquidity where it did not previously exist. (Mutual Funds)

Comparing Money Market Securities: Money Market Securities and Their Depth

TABLE 11.4 Money Market Securities and Their Markets

Money Market Security	Issuer	Buyer	Usual Maturity	Secondary Market
Treasury bills	U.S. government	Consumers and companies	4, 13, and 26 weeks	Excellent
Federal funds	Banks	Banks	1 to 7 days	None
Repurchase agreements	Businesses and banks	Businesses and banks	1 to 15 days	Good
Negotiable certificates of deposit	Large money center banks	Businesses	14 to 120 days	Good
Commercial paper	Finance companies and businesses	Businesses	1 to 270 days	Poor
Banker's acceptance	Banks	Businesses	30 to 180 days	Good
Eurodollar deposits	Non-U.S. banks	Businesses, governments, and banks	1 day to 1 year	Poor

Chapter Summary

- The Money Markets Defined
  - Short-term instruments
  - Most have a low default probability
- The Purpose of Money Markets
  - Used to “warehouse” funds
  - Returns are low because of low risk and high liquidity
- Who Participates in Money Markets?
  - U.S. Treasury
  - Commercial banks
  - Businesses
  - Individuals (through mutual funds)

Chapter Summary

- Money Market Instruments
  - Include T-bills, fed funds, etc.
- Comparing Money Market Securities
  - Issuers range from the US government to banks to large corporations
  - Mature in as little as 1 day to as long as 1 year
  - The secondary market liquidity varies substantially

Chapter 20: The Mutual Fund Industry

Chapter Preview

Suppose you wanted to start savings for retirement, but you can only afford to invest $100 / month. How do you develop a diversified portfolio?

Mutual funds are one potential answer. Mutual funds pool funds under a professional manager who then chooses the securities to invest in.

Chapter Preview

- We study why mutual funds have become so popular, the various types of mutual funds, their regulation, and scandals in the mutual fund industry. Topics include:
  - The Growth of Mutual Funds
  - Mutual Fund Structure
  - Investment Objective Classes
  - Fee Structure of Investment Funds
  - Hedge Funds
  - Conflicts of Interest in the Mutual Fund Industry

Mutual Funds

- What are mutual funds?

Mutual funds pool the resources of many small investors by selling them shares and using the proceeds to buy securities.

- Ownership in mutual funds has changed dramatically over the last 20 years
  - In 1980, only 5.7% of households held mutual fund shares
  - In the beginning of 2010, that number was 82%
  - Mutual funds account for $3.1 trillion of the retirement market (estimated at $14 trillion)

The Growth of Mutual Funds

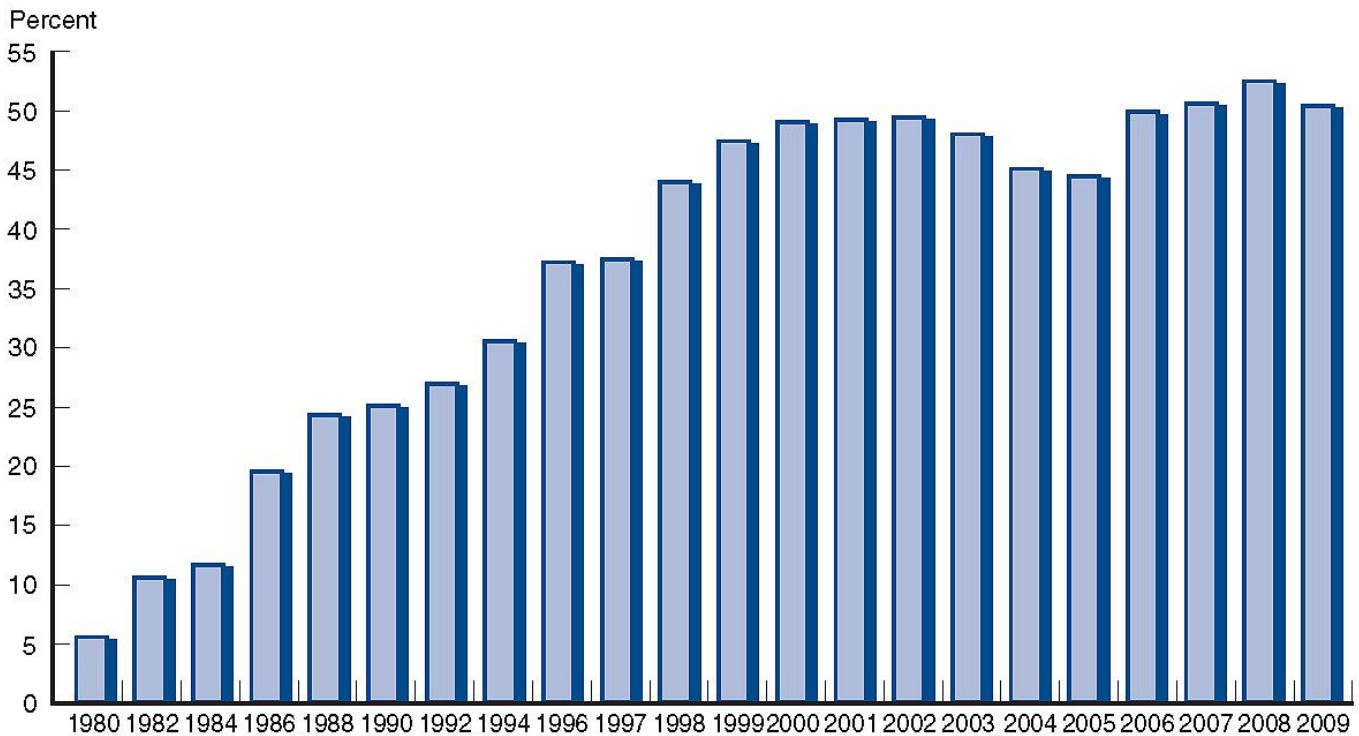


FIGURE 20.1 Household Ownership of Mutual Funds

Data Source: Investment Company Institute, *2010 Investment Company Fact Book*, 50th ed. (Washington, DC: ICI), p. 80. www.icifactbook.org/index.html.

Mutual Funds

- There are five principal benefits of mutual funds:

1. Liquidity intermediation: investors can quickly convert investments into cash while still allowing the fund to invest for the long term.
2. Denomination intermediation: investors can participate in equity and debt offerings that, individually, require more capital than they possess.
3. Diversification: investors immediately realize the benefits of diversification even for small investments.
4. Cost advantages: the mutual fund can negotiate lower transaction fees than would be available to the individual investor.
5. Managerial expertise: many investors prefer to rely on professional money managers to select their investments.

Mutual Fund Structure

- Mutual fund companies usually offer a number of different types of mutual funds. They are called *complexes* and are defined as a group of funds under substantially common management, composed of one or more families of funds.

- Investors can often move investments among these funds without penalty.

- Account information can be summarized by the complex to help investors keep their assets organized.

Mutual Fund Structure

- Closed-End Mutual Fund: a fixed number of nonredeemable shares are sold through an initial offering and are then traded in the OTC market. Price for the shares is determined by supply and demand forces.

- The advantage of Closed-End Mutual Fund to managers is that investors cannot make withdrawals. Investors can only sell shares to get money back.

- The disadvantage of Closed-End Mutual Fund is that once shares have been sold, the fund cannot take in any more investment dollars. Thus, to grow the fund managers must start a whole new fund.

Mutual Fund Structure

- Open-End Mutual Fund: investors may buy or redeem shares at any point, where the price is determined by the **net asset value** of the fund.

- Open-End Mutual Funds have two advantages:
  - Because the fund agrees to redeem shares at any time, the investment is very liquid.
  - The open-end structure allows mutual funds to grow unchecked.

Calculating a Mutual Fund's Net Asset Value

- ***Net Asset Value (NAV)***
- *Definition:* Total value of the mutual fund's stocks, bonds, cash, and other assets minus any liabilities such as accrued fees, divided by the number of shares outstanding

Stocks	$35,000,000
Bonds	$15,000,000
Cash	$3,000,000
Total value of assets	$53,000,000
Liabilities	–$800,000
Net worth	$52,200,000
Outstanding shares	15 million

NAV = $52,200,000/15,000,000 = $3.48

Mutual Fund Structure: the Organization

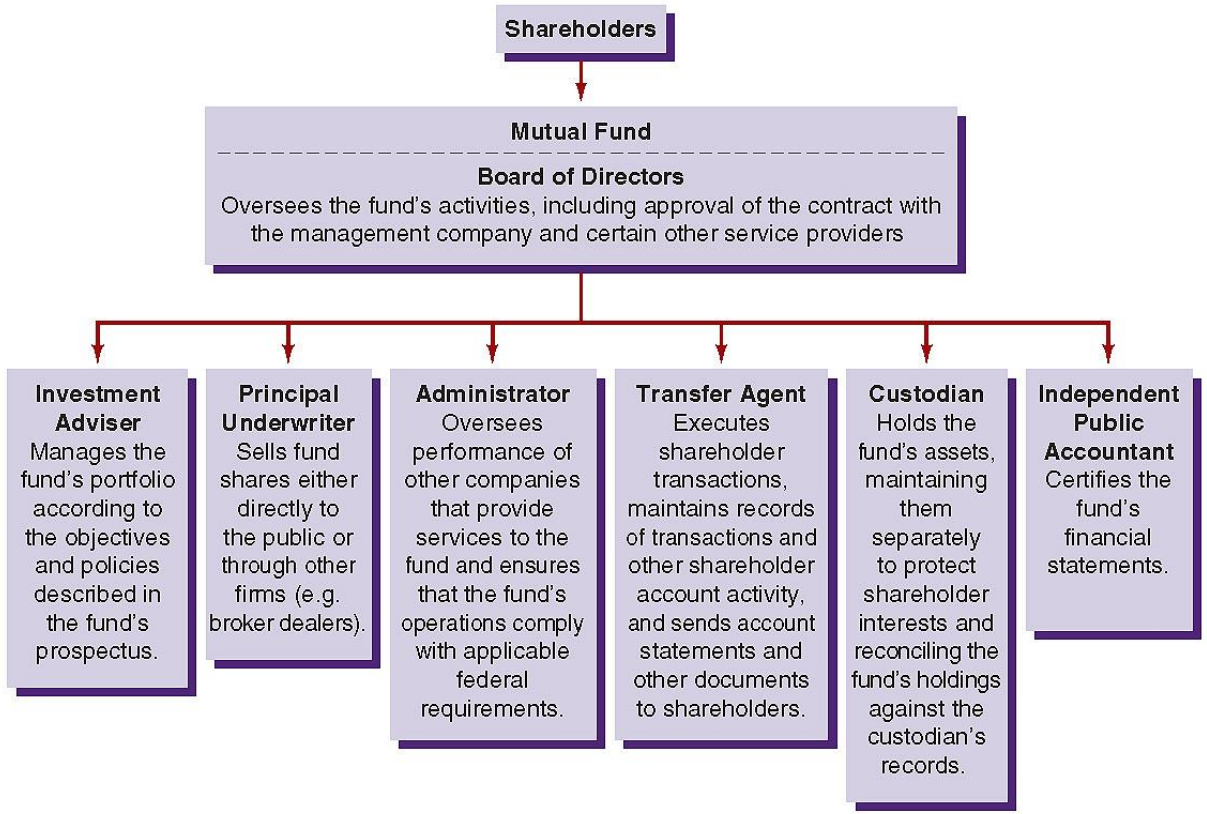


FIGURE 20.3 The Organizational Structure of a Mutual Fund

Source: Investment Company Institute, *2010 Investment Company Fact Book*, 50th Ed. (Washington DC: ICI). Reprinted with permission.

Mutual Fund Structure: the Organization

- The shareholders, or owners, of the mutual fund are the investors.
- The board of directors oversees the fund's activities, hires the investment advisor, an underwriter, etc., to manage the day to day operations of the fund.
- The investment advisers manage the fund in accordance with the fund's stated objectives and policies.
- The fund can contract with other firms to provide additional services. These will include underwriters, transfer agents , and custodians.

Investment Objective Classes

- There are four primary classes of mutual funds available to investors:

1. Stock (equity) funds
2. Bond funds
3. Hybrid funds
4. Money market funds

Investment Objective Classes

This figure shows the distribution of assets among these different classes.

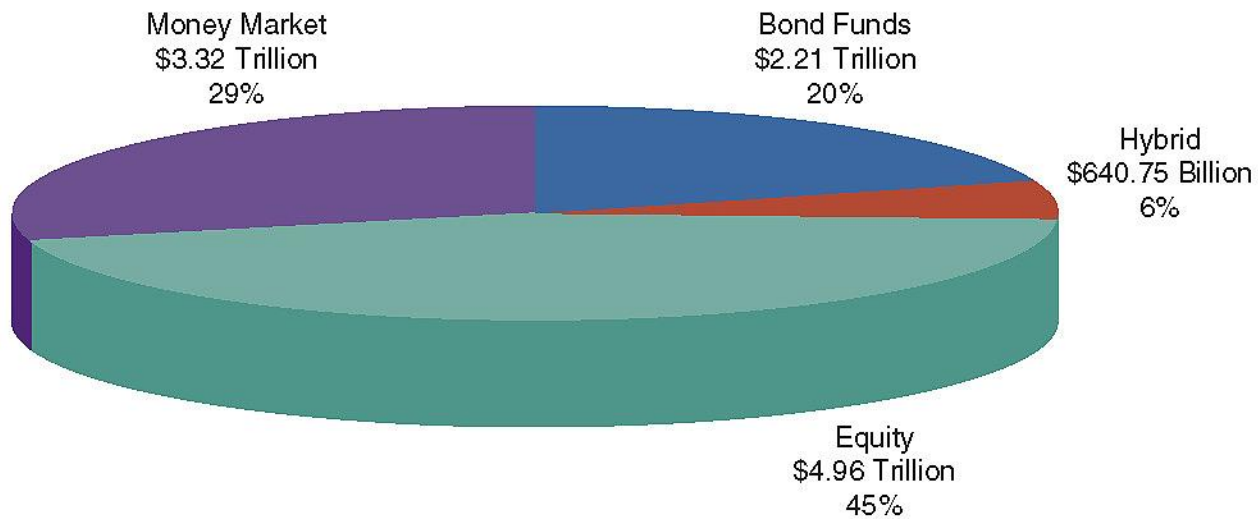


FIGURE 20.4 Distribution of Assets Among Types of Mutual Funds

Data Source: Investment Company Institute, *2010 Investment Company Fact Book*, 50th ed. (Washington, DC: ICI), p. 126. www.icifactbook.org/index.html.

Investment Objective Classes

- Stock Funds: other than investing in common equity, the stated objective of any particular fund can vary dramatically.

  - **Capital Appreciation Funds** seek rapid increase in share price, not being concerned about dividends.

  - **Total Return Funds** seek a balance of current income and capital appreciation.

  - **World Equity Funds** invest primarily in foreign firms.

  - Other types in Value, Growth, a particular industry, etc.

Investment Objective Classes

- Bond Funds:

  - **Strategic Income Funds** invest primarily in U.S. corporate bonds, seeking a high level of current income.

  - **Government Bond Funds** invest in U.S. Treasury, as well as state and local government bonds.

  - Others include World Bond Funds, etc.

Investment Objective Classes

This figure shows the distribution of assets among the bond fund classifications.

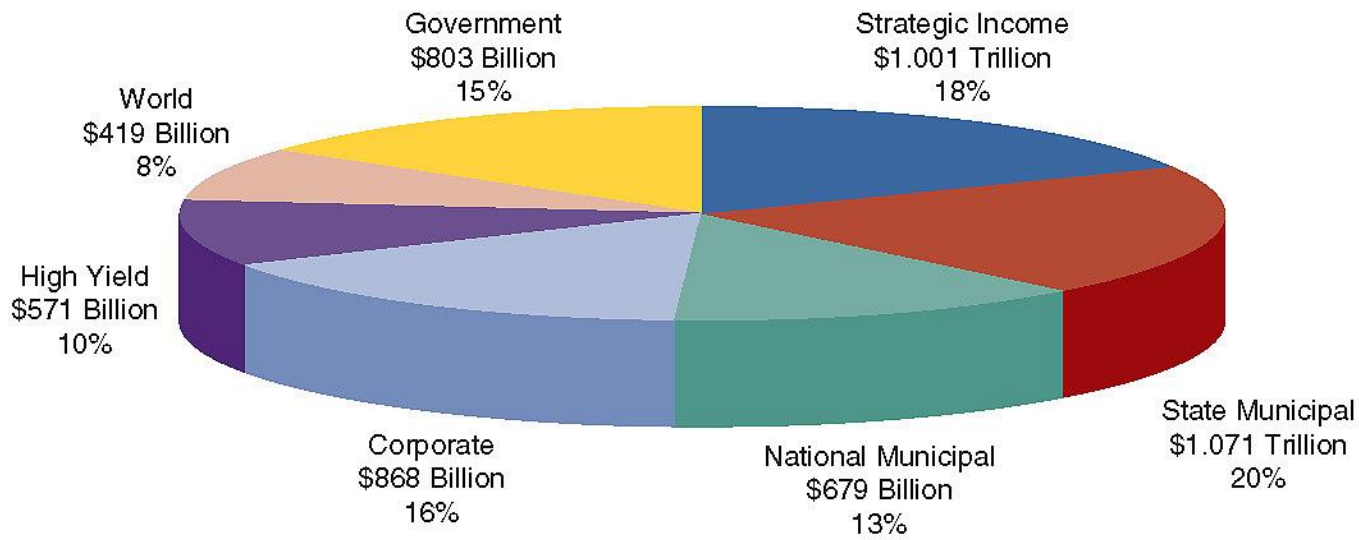


FIGURE 20.5 Assets Invested in Different Types of Bond Mutual Funds

Data Source: Investment Company Institute, *2010 Investment Company Fact Book*, 50th ed. (Washington, DC: ICI), p. 131. www.icifactbook.org/index.html.

Investment Objective Classes

- Hybrid Funds
  - Combine stocks and bonds into a single fund.
  - Account for about 5% of all mutual fund accounts.

- Money Market Mutual Funds
  - Open-end funds that invest only in money market securities.
  - Offer check-writing privileges.
  - Although money market mutual funds offer higher returns than bank deposits, the funds are not federally insured.
  - Net assets have grown dramatically, as seen in the next slide.

Money Market Mutual Funds

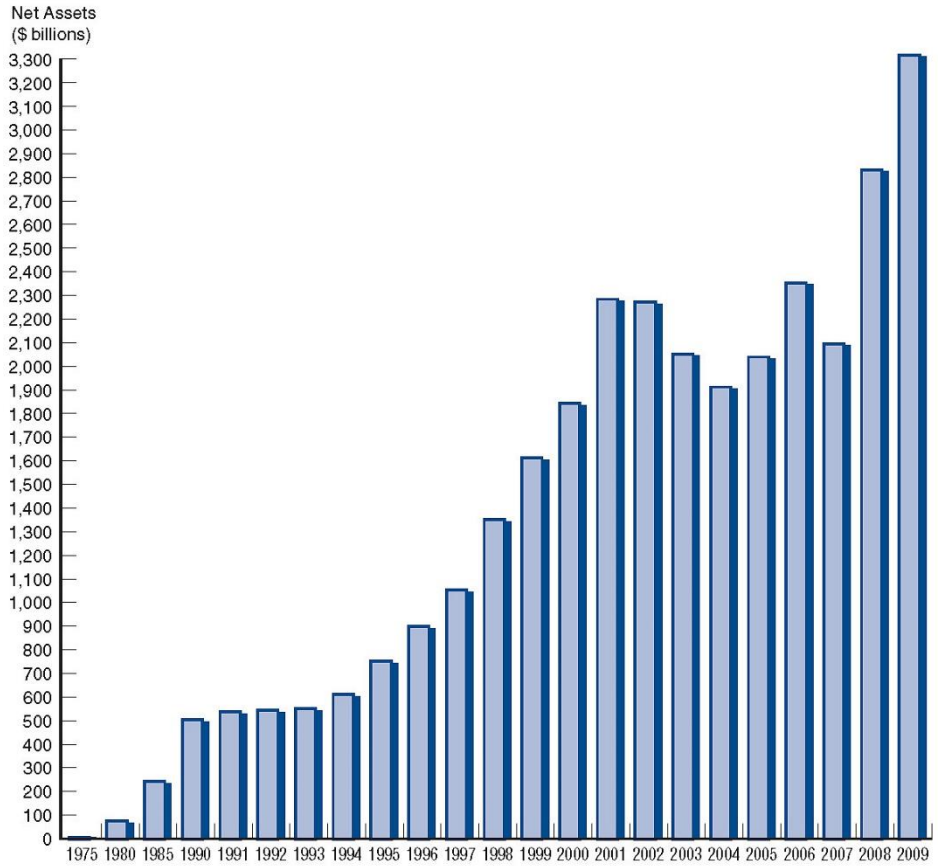


FIGURE 20.6 Net Assets of Money Market Mutual Funds

Data Source: Investment Company Institute, *2010 Investment Company Fact Book*, 50th ed. (Washington, DC: ICI), p. 160. www.icifactbook.org/index.html.

Investment Objective Classes

The figure shows the distribution of assets in MMMF, which are relatively safe assets.

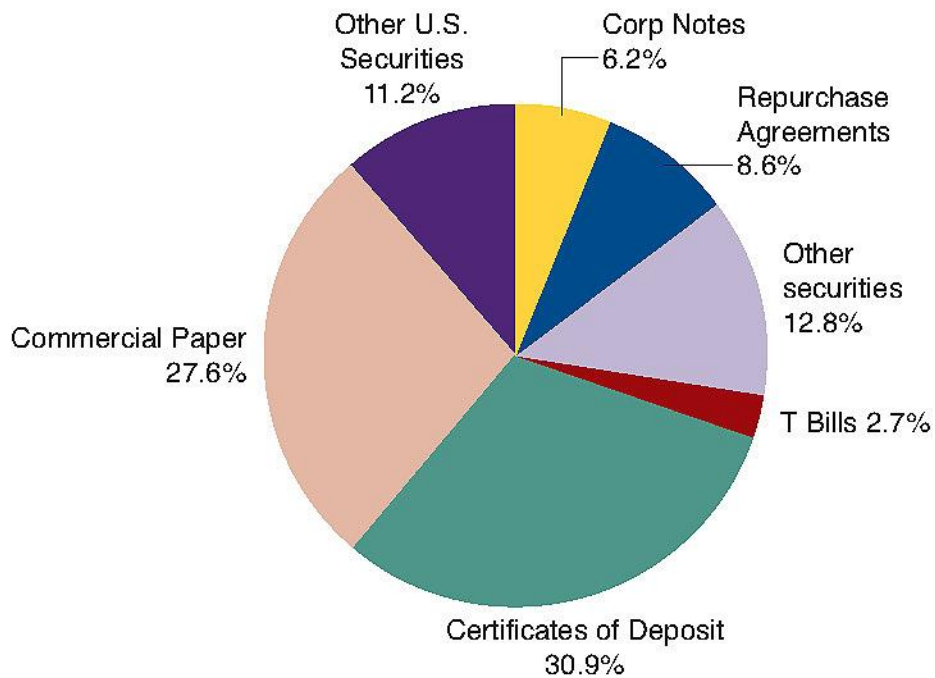


FIGURE 20.7 Average Distribution of Money Market Fund Assets, 2010

Data Source: Investment Company Institute, *2010 Investment Company Fact Book*, 50th ed. (Washington, DC: ICI), p. 166. www.icifactbook.org/index.html.

Investment Objective Classes

- Index Funds

  - A special class of mutual funds that do fit into any of the categories discussed so far.
  - The fund contains the stock of the index it is mimicking. For example, an S&P 500 index fund would hold the equities comprising the S&P 500.
  - Offers benefits of traditional mutual funds without the fees of the professional money manager.

Fee Structure of Investment Funds

- **Load** funds (class A shares) charge an upfront fee for buying the shares.

- **Deferred load** (class B shares) funds charge a fee when the shares are redeemed. Deferred load can discourage early withdrawal of deposits.

- **No-load** (class C shares) funds charges no front or back end fees.

- No research supports the argument that investors get better returns by investing in funds that charge higher fees.

Fee Structure of Investment Funds

- Other fees charges by mutual funds include:
  - *contingent deferred sales charge*: a back end fee that may disappear altogether after a specific period.
  - *redemption fee*: another name for a back end load
  - *exchange fee*: a fee (usually low) for transferring money between funds in the same family.
  - *account maintenance fee*: charges if the account balance is too low.
  - *12b-1 fee*: fee to pay marketing, advertising, and commissions.

Hedge Funds

- A special type of mutual fund that received considerable attention following the collapse of Long Term Capital Management.

- Different from typical mutual funds, as follows:
  - High minimum investment, averaging around $1 million
  - Long-term commitment of funds is required
  - High fees: typically 1% of assets plus 20% of profits
  - Highly leveraged
  - Little current regulation

Hedge Funds

- Hedge funds are often trying to take advantage of unusual spreads between security prices

- For example, at LTCM, the managers find that 29.5-year U.S. Treasury bonds seemed cheap relative to 30-year Treasury securities. The managers figured that the value of the two bonds would converge over time.

- LTCM bought $2 billion of the 29.5-year bonds and sold short $2 billion of the 30-year bonds. Six months later, the fund reversed these transactions, and realized a $25 million profit!

Hedge Funds

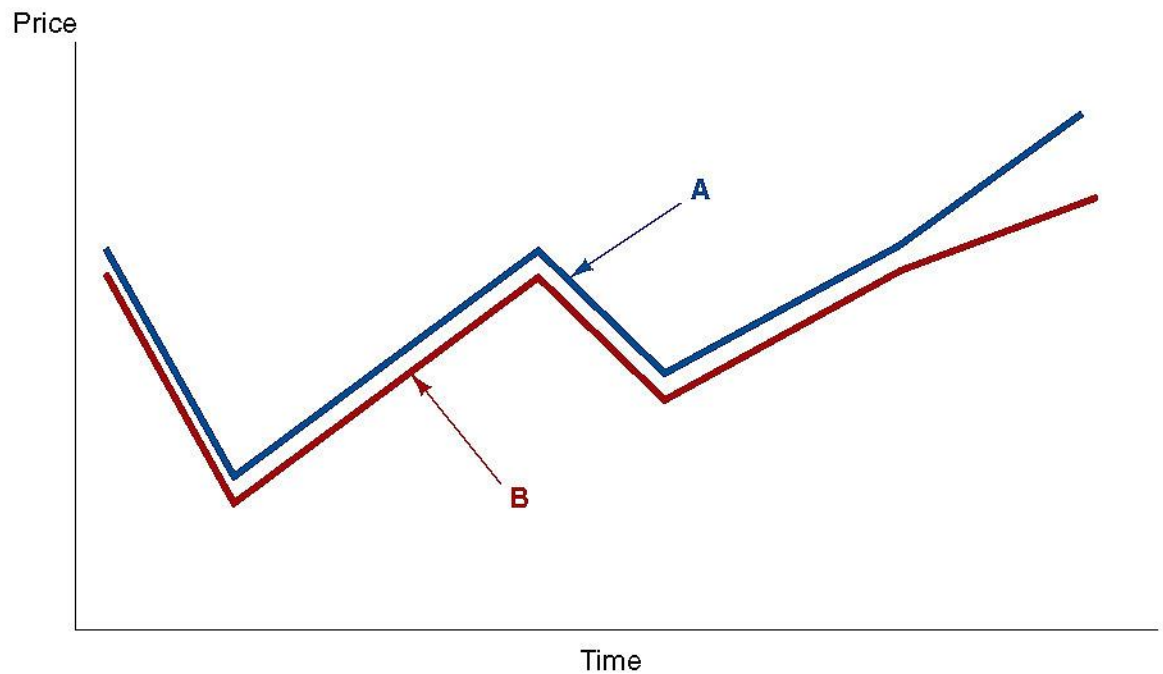


FIGURE 20.8 The Price of Two Similar Securities

Hedge funds search for related securities that historically move in lockstep but have temporarily diverted. In this example, the hedge fund would sell security A short and buy security B.

Conflicts of Interest in the Mutual Fund Industry

- Investor confidence in the stability and integrity of the mutual fund industry is critical.

- However, the usual problems of asymmetric information and the principal-agent problem arose, leading to abuses on the part of fund management.

- Mutual Fund Abuses
  - Late trading: allowing trades after 4:00 pm to trade at today's 4:00 NAV instead of tomorrow's price. This is illegal under SEC regulations.
  - Market timing: taking advantage of time zone differences for determination of NAV. This is not illegal under SEC rulings.

Extra: Exchange-Traded Funds (ETFs)

- An ETF is a type of exchange-traded investment product available for retail investors.

- How are ETFs similar to mutual funds?

(1) Both offer investors a way to pool their money in a fund that makes investments in stocks, bonds, other assets, or some combination of these investments.

(2) Investors receive an interest in their investment pool.

(3) EFTs and Mutual Funds are investment companies that must be registered with the SEC.

Extra: Exchange-Traded Funds (ETFs)

How are ETFs similar to mutual funds?

(4) ETFs and Mutual Funds must calculate their net asset value or NAV per share (the value of all its assets minus all its liabilities divided by the number of shares) every business day.

(5) Both ETFs and Mutual Funds can be index-based or actively managed.

Extra: Exchange-Traded Funds (ETFs)

- How are ETFs different from mutual funds?

(1) ETFs do not sell individual shares directly to, or redeem their individual shares directly from, retail investors.

(2) ETF shares are traded throughout the day on national stock exchanges and at market prices.

(3) Most ETFs post their portfolio holdings on their websites daily.

How does ETFs work?

- Market Transactions.
- Purchase creation units.
- Redeem creation units.
- Market Prices versus NAV.
- Arbitrage.

Source: Investor.gov-Exchange-Traded Funds (ETFs)

Chapter Summary

- The Growth of Mutual Funds: mutual funds growth has been dramatic, increasing from under $300 billion in 1980 to over $10 trillion in 2004.
- Mutual Fund Structure: the organization structure, including ownership, the board, and operations of the fund were reviewed.
- Investment Objective Classes: along with delineating equity and debt funds, we also reviewed classes on funds within each major category.
- Fee Structure of Investment Funds: the various fees charged by funds were defined and reviewed.
- Hedge Funds: the purpose, definition, and differences between traditional mutual funds and hedge funds was discussed.
- Conflicts of Interest in the Mutual Fund Industry: recent abuses and governmental responses to those abuses was outlined.

Acknowledgment

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