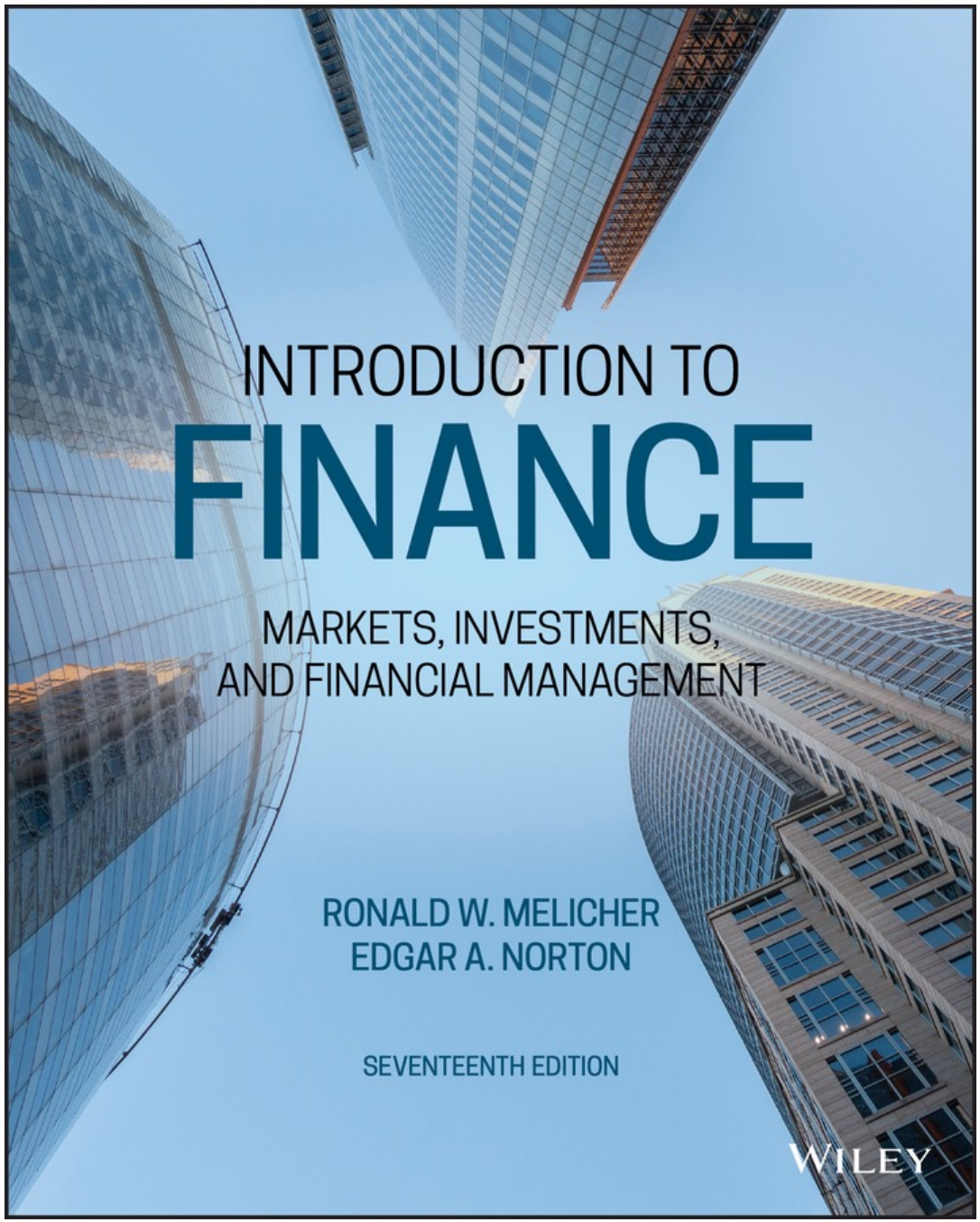
Chapter 8

Interest Rates



Learning Objectives

- LO 8.1 Describe how interest rates change in response to shifts in the supply and demand for loanable funds.
- LO 8.2 Identify the major components of market interest rates.
- LO 8.3 Describe the types of U.S. Treasury marketable securities and indicate who owns them.

Learning Objectives

- LO 8.4 Define the term structure of interest rates and describe the three theories used to explain the term structure.
- LO 8.5 Discuss historical and recent price movements in the United States and describe the various types of inflation.
- LO 8.6 Describe default risk and default risk premiums and discuss how these premiums are observed and measured.

Section 8.1 Supply and Demand for Loanable Funds

- LO 8.1 Describe how interest rates change in response to shifts in the supply and demand for loanable funds.

Basic Concepts

Loanable Funds

- Amount of money made available by lenders to borrowers

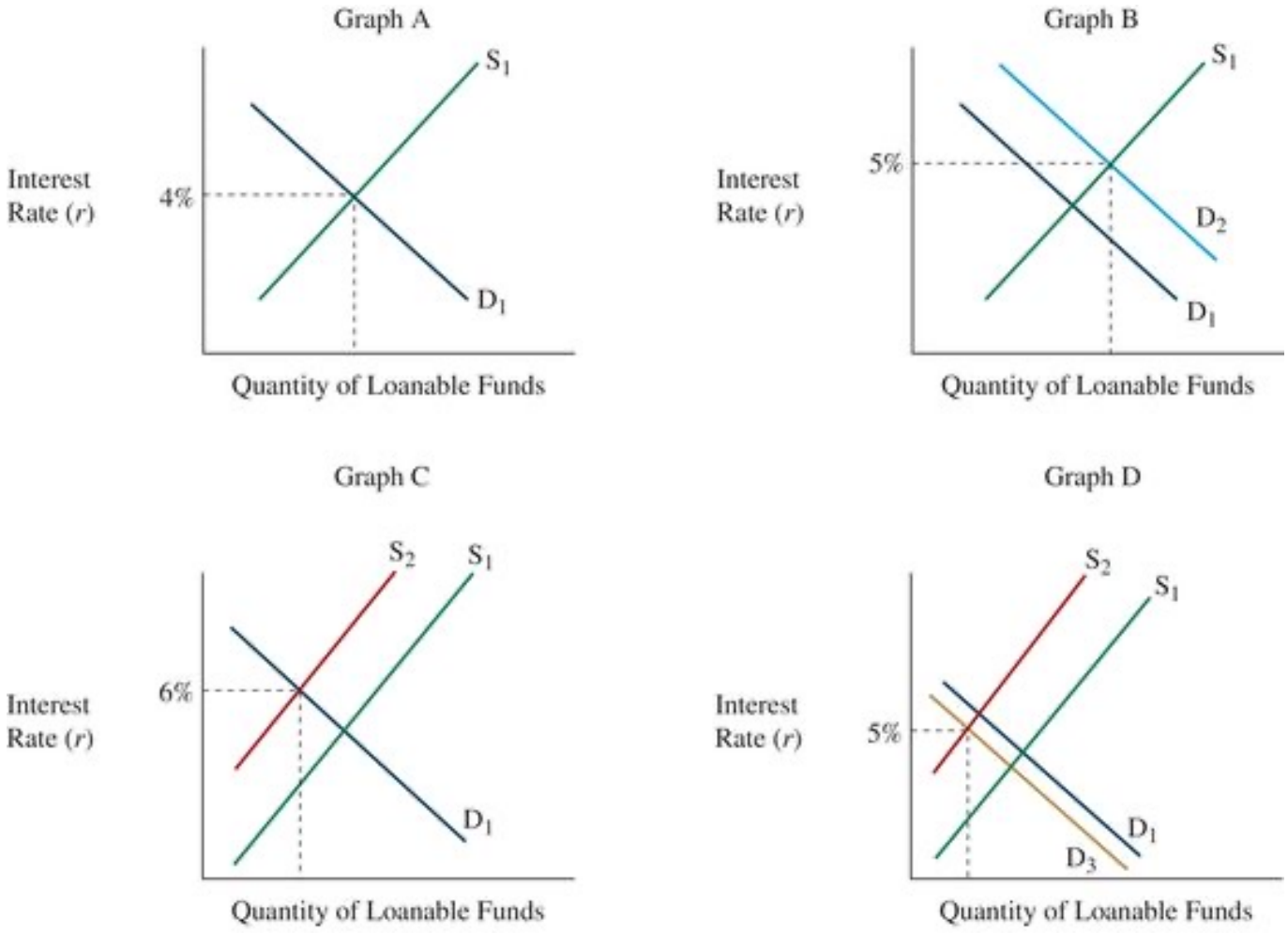
Interest Rate

- Price of loanable funds in financial markets

Equilibrium Interest Rate

- Price that equates the demand for and supply of loanable funds

Figure 8.1 Interest Rate Determination in the Financial Markets



Historical Changes in U.S. Interest Rate Levels

Periods of Rising Interest Rates

- 1864-1873 (rapid economic expansion after the Civil War)
- 1905-1920 (pre-war expansion and World War I-related inflation)
- 1927-1933 (economic boom in late 1920s followed by major depression)
- 1946- 1982 (rapid economic expansion after World War II)

Historical Changes in U.S. Interest Rate Levels

Periods of Falling Interest Rates

- 1873-1905 (supply of funds exceeded demand for funds and prices fell)
- 1920-1927 (rapid growth in supply of funds and falling prices)
- 1933-1946 (actions taken to fight the depression and finance World War II)
- 1982-present (declining inflation and interest rates)

Loanable Funds Theory

Loanable Funds Theory

Holds that interest rates are a function of the supply of and demand for loanable funds

Two Basic Sources of Loanable Funds

- Current savings from all sectors (primarily businesses and individuals) of the economy
- Expansion of deposits by depository institutions

Factors Affecting the Supply of Loanable Funds

Volume of Savings

The major factor that determines the volume of savings is the level of the nation's income

Expansion of Deposits by Depository Institutions

Amount of short-term credit available depends on lending policies of depository institutions and the Fed

Liquidity Attitudes

The economic outlook impacts the willingness to lend loanable funds

Section 8.2 Components of Market Interest Rates

- LO 8.2 Identify the major components of market interest rates.

Market Interest Rate Components

Market Interest Rate (r)

Interest rate that is observed in the marketplace for a debt instrument (also called a nominal interest rate)

Real Rate of Interest (RR)

Interest rate on a risk-free debt instrument when no inflation is expected

Inflation Premium (IP)

Additional expected return to compensate for anticipated inflation over the life of a debt instrument

Market Interest Rate Components

Risk-Free Interest Rate

Interest rate containing only a real rate of interest component and an inflation premium

Basic Equation

r = RR + IP

Default Risk Premium (DRP)

Additional expected return to compensate for the possibility a borrower will fail to pay interest and/or principal when due

Basic Equation Expanded for Default Risk

r = RR + IP + DRP

Market Interest Rate Components

Maturity Risk Premium (MRP)

- Additional expected return to compensate for interest rate risk on debt instruments with longer maturities

Liquidity Premium (LP)

- Additional expected return to compensate for debt instruments that cannot be easily converted to cash at pries close to their estimated fair market values

Basic Equation Expanded for Maturity and Liquidity Risks

- r = RR + IP + DRP + MRP + LP

Interest Rate Risk

- **Interest Rate Risk:** Risk of changes in the price or value of fixed-rate debt instruments resulting from changes in market interest rates
- Interest rate risk exists because there is an inverse relationship between debt instrument values or prices and market or nominal interest rates in the marketplace.

Negative Interest Rate

- **Negative Interest Rate:** Occurs when a financial institution or government charges an amount greater than the interest it pays to depositors or debt security holders
- A central bank might charge a fee greater than the interest it pays on money held by its member banks at the central bank
- A government might charge negative interest on the debt securities it issues; for example, a zero interest rate debt security might be issued at a price above the par value at which the security will be redeemed at maturity

Negative Interest Rate Examples

- Negative interest rate policies have been implemented by a number of central banks in recent years as a means of supporting their easy monetary policy efforts
- Negative interest on bank excess reserves to discourage the holding of excess cash and to encourage lending to stimulate economic growth have been imposed by the European Central Bank, and the central banks of Denmark, Sweden, and Switzerland
- Governments in Japan and several European countries have moved to below zero interest rate policies to stimulate their economies
- To date, the U.S. has not moved to a negative interest rate policy on excess reserves or on newly issued Treasury securities

Section 8.3 Default Risk-Free Securities: U.S. Treasury Debt Instruments

- LO 8.3 Describe the types of U.S. Treasury marketable securities and indicate who owns them.

Two Types of U.S. Government Debt Obligations

Marketable Government Securities

- Treasury securities that may be bought and sold through the customary market channels

Nonmarketable Government Securities

- Securities that cannot be transferred between persons or institutions but must be redeemed with the U.S. government

Types of U.S. Treasury Debt Obligations

Treasury Bills

- Government securities issued with maturities up to one year

Treasury Notes

- Government securities issued with maturities ranging from two to 10 years

Treasury Bonds

- Government securities issued with maturities ranging from 11 to 30 years

Ownership of U.S. Treasury Securities

*as of June 2018	Percent
Federal Reserve and Government Accounts	38.2%
Private Investors	61.8%
Selected Private Investors:	
Foreign & International Investors	29.3%
Mutual Funds	8.6%
Depository Institutions	3.2%
Pension Funds	4.2%

Maturity Distribution of Marketable Interest-Bearing Public Debt Held by Private Investors

*as of September 2018	Percent
Within 1 year	29.5%
1-5 years	40.2%
5-10 years	19.0%
10-20 years	0.9%
20 years and over	10.4%
Average maturity: 5 years, 5 months	

Section 8.4 Term or Maturity Structure of Interest Rates

- LO 8.4 Define the term structure of interest rates and describe the three theories used to explain the term structure.

Structure of Interest Rates

Term Structure of Interest Rates

Relationship between interest rates and the time to maturity for debt instruments of comparable quality

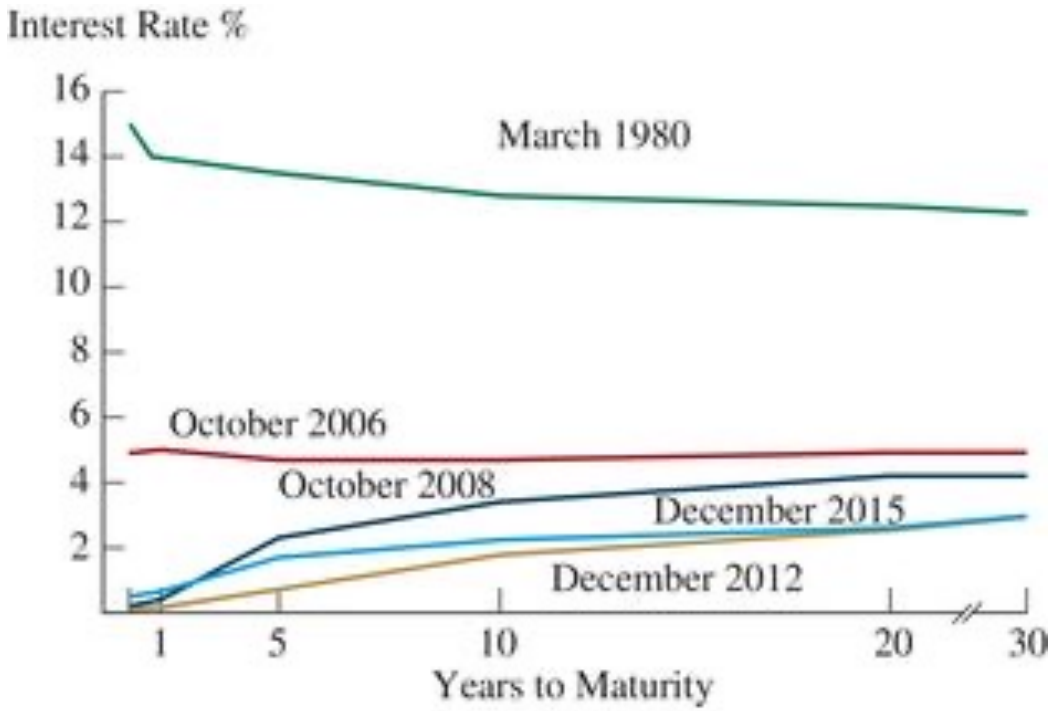
Yield Curve

Graphic presentation of the term structure of interest rates at a point in time

Interest Rates for Treasury Securities at Two Selected Dates

Maturity	March 1980	Dec. 2018
6 months	15.0%	2.54%
1 year	14.0%	2.66%
5 years	13.5%	2.68%
10 years	12.8%	2.83%
20 years	12.5%	2.98%
30 years	12.3%	3.10%

Figure 8.2 Yield Curves for Treasury Securities at Selected Dates



Three Term Structure Theories

Expectations Theory

States that the shape of the yield curve indicates investor expectations about future inflation rates

Liquidity Preference Theory

States that investors are willing to accept lower interest rates on short-term debt securities that provide greater liquidity and less interest rate risk

Three Term Structure Theories

Market Segmentation Theory

States that interest rates may differ because securities of different maturities are not perfect substitutes for each other

Section 8.5 Inflation Premiums and Price Movements

- LO 8.5 Discuss historical and recent price movements in the United States and describe the various types of inflation.

Definition and International Price Movements

Inflation

An increase in the price of goods or services that is not offset by an increase in quality

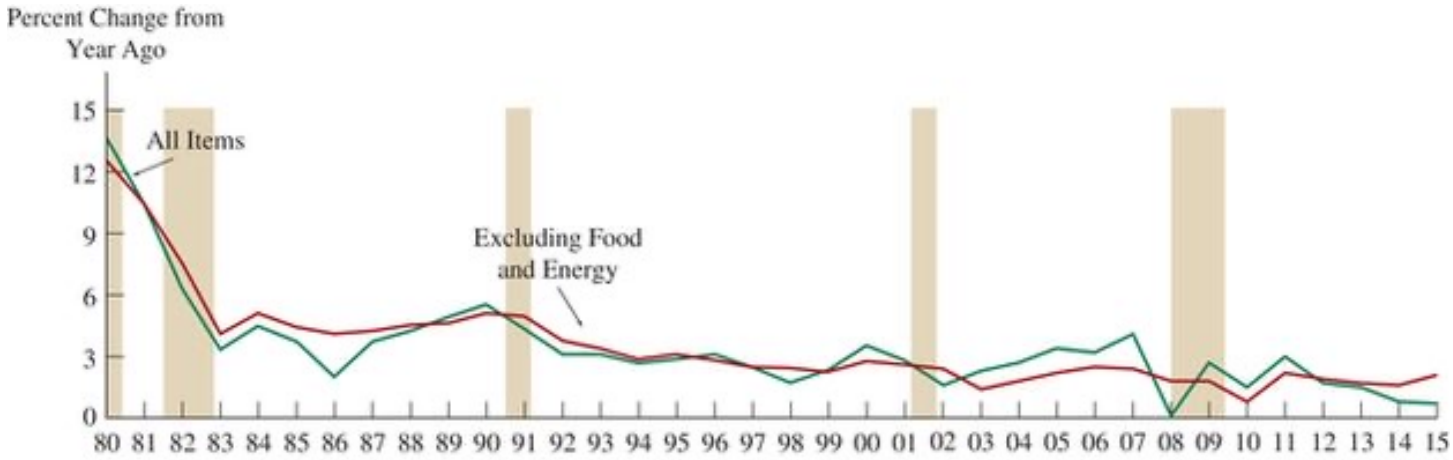
Historical Price Movements

Changes in the money supply or in the amount of metal in the money unit have influenced prices since the earliest records of civilization

Periods of Inflation in the U.S.

- Revolutionary War
- War of 1812
- Civil War
- World War I
- World War II
- Postwar Period through Early 1982

Figure 8.3 Changes in Consumer Price Indexes, 1980-2015



Types of Inflation

Cost-Push Inflation

Occurs when prices are raised to cover rising production costs, such as wages

Demand-Pull Inflation

Occurs when an excessive demand for goods and services is created during periods of economic expansions as a result of large increases in the money supply

Types of Inflation

Speculative Inflation

- Caused by the expectation that prices will continue to rise, resulting in increased buying to avoid even higher future prices

Administrative Inflation

- The tendency of prices, aided by union-corporation contracts, to rise during economic expansion and to resist declines during recessions

Section 8.6 Default Risk Premiums

- LO 8.6 Describe default risk and default risk premiums and discuss how these premiums are observed and measured.

Default Risk Concepts

Default Risk

- Risk that a borrower will not pay interest and/or principal on a debt instrument when due

Basic Equation Expanded for Default Risk

$r = RR + IP + DRP$

$DRP = r - RR - IP$

Basic Equation Expanded for Maturity and Liquidity Risks

$r = RR + IP + DRP + MRP + LP$

$DRP = r - RR - IP - MRP - LP$

Default Risk Premium Example

Basic Information

Market interest rate = 7%; real rate = 2%; inflation premium = 3%; and maturity risk and liquidity premiums = 0%. What is the default risk premium?

Fully Expanded Equation

$r = RR + IP + DRP + MRP + LP$

$DRP = r - RR - IP - MRP - LP$

$DRP = 7\% - 2\% - 3\% - 0\% - 0\% = 2\%$

Recent Default Risk Premiums

*as of December2018	Percent
For Aaa-Rated Bonds:	
Aaa Bond Interest Rate	4.02%
Less 20-year Gov't Rate	2.98%
Equals Aaa DRP	1.04%
For Baa-Rated Bonds:	
Baa Bond Interest Rate	5.13%
Less 20-year Gov't Rate	2.98%
Equals Baa DRP	2.15%

Risky Corporate Bonds

Investment Grade Bonds

- Ratings of Baa or higher (Aaa, Aa, or A) that meet financial institution investment standards (some rating agencies make multiple distinctions of quality in the Baa, or equivalent, category)

High-Yield or Junk Bonds

- Bonds that have a relatively high probability of default

Web Links

- www.treasurydirect.gov
- www.treasury.gov
- www.federalreserve.gov
- www.whitehouse.gov/cea
- wwwstlouisfed.org