

Chapter 6

Determining Market Interest Rates

1

Two Major Causes of Interest Rate Differences

- I. Differences in interest rates over time due to changes in the macroeconomy, holding the intrinsic characteristics of the securities constant.
- II. Differences in interest rates intrinsic to the security, like term and risk, holding macroeconomic variables constant

2

I. Macroeconomic Influences on Interest Rate

Loanable funds framework (Bond's market framework)

Liquidity preference theory

3

Loanable Funds Theory of Interest Rate

- Short-term, the level of interest rates is determined by the supply and demand for loanable funds.
 - Short-run supply/demand factors affect nominal interest rates.
 - The quantity demanded of loanable funds, DL , is inversely related to the level of interest rates; the quantity supplied is directly related to interest rates.

4

Sources of Supply of and Demand for Loanable Funds

Supply of Loanable Funds

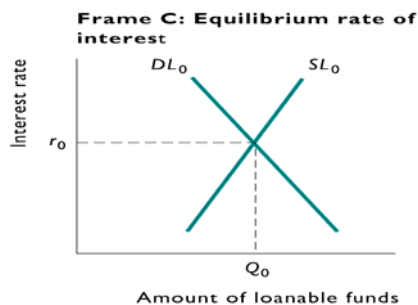
1. Consumer savings
2. Business savings (depreciation and retained earnings)
3. State and local government budget surpluses
4. Federal government budget surplus (if any)
5. Federal Reserve increases the money supply (ΔM)

Demand for Loanable Funds

1. Consumer credit purchases
2. Business investment
3. Federal government budget deficits
4. State and local government budget deficits

5

Loanable Funds Theory of Interest Rate Determination



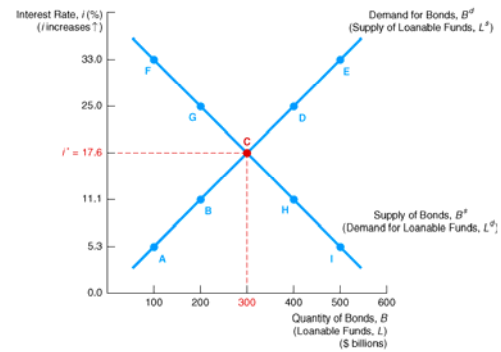
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Bond's Market Framework

- Changes in bond demand or supply will change the bond price and interest rate.
- Theory of portfolio allocation can explain bond demand curve shifts.
- Changes in willingness and ability to borrow shifts the supply curve.

7

Supply & demand of bonds



8

Factors Shifting Increasing Bond Demand

- Higher wealth
- Higher expected returns on bonds
- Lower expected inflation
- Lower expected return on other assets
- Lower relative riskiness of bonds
- Higher relative liquidity of bonds
- Lower relative information costs of bonds

9

Factors Increasing Bond Supply

- Higher expected profitability of capital
- Lower business taxes
- Higher expected inflation
- Higher government borrowing

10

Liquidity Preference Framework

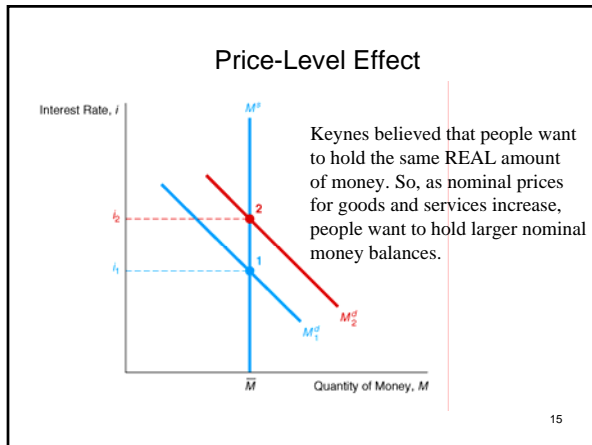
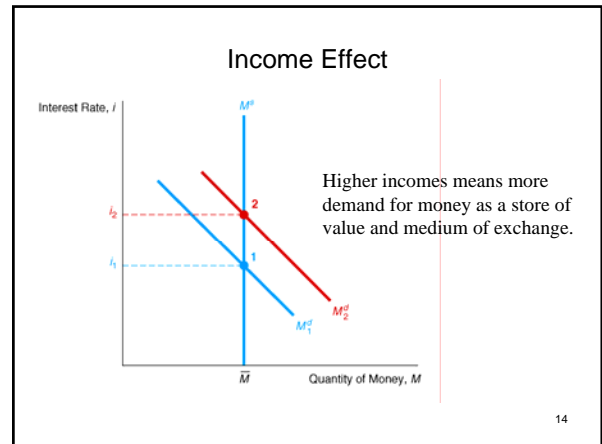
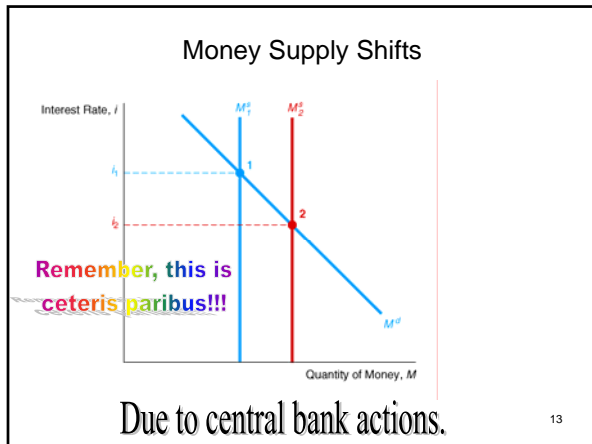
- Generates the same answers about interest rate movements as the Loanable Funds Framework
- BUT, the Loanable Funds framework helps to explain expected inflation better
- Keynes's theory better helps to explain the effects on interest rates from:
 - changes in income
 - changes in price level
 - the money supply

11

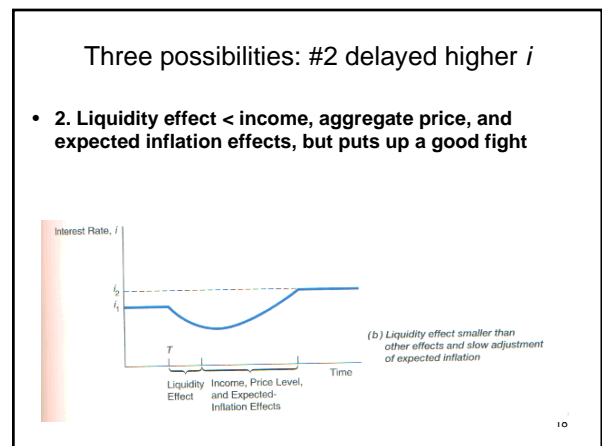
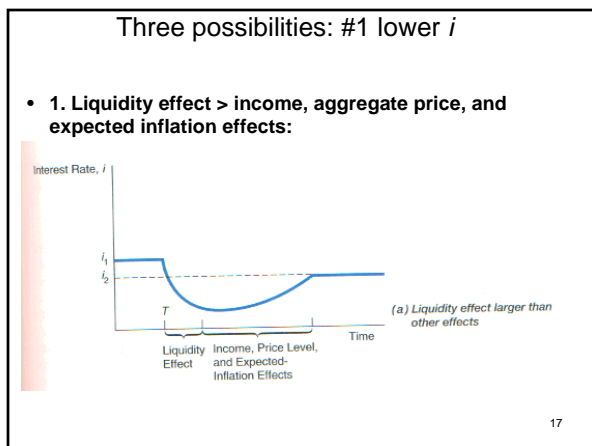
Assumptions of the Liquidity Preference Framework

- only 2 assets:
 - money (zero return)
 - bonds (varying returns)
- equilibrium in money s & d means equilibrium in bond s & d has also been achieved
- THEREFORE as interest rates increase, demand for money falls, i.e. i and demand for money negatively related

12

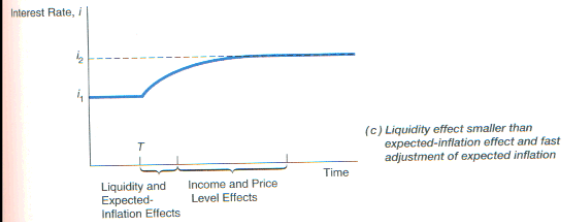


- ### Money Supply and Interest Rates
- The relationship between the money supply and interest rates, however, is not so simple.
 - Milton Friedman's critique:
 - initial change = "liquidity effect"
 - BUT changes in money supply NOT *ceteris paribus*:
 - Money supply increases will also:
 - raise incomes
 - raise aggregate price levels
 - raise inflation expectations
- 16



Three possibilities: #3 higher i

- 3. Liquidity effect < income, aggregate price, and expected inflation effects and quickly overwhelmed



19

Chapter 7

Risk Structure and Term Structure of Interest Rates

20

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21

II Interest Rate Differences: Intrinsic to the Security

- Interest Rate Changes & Differences Between Interest Rates Can Be Explained by Several Variables
 - Term to Maturity.
 - Default Risk.
 - Tax Treatment.
 - Marketability/Liquidity.

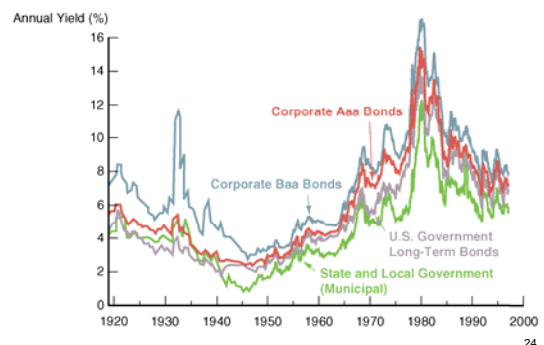
22

Default Risk

- Risk that the issuer of the security will not have adequate resources to fulfill the contract (pay interest, repay principal).
- Default risk is measured relative to risk-free U.S. Treasury bonds.
- Default-risk premium = bond yield - yield on a comparable default-risk-free bond.
- The risk premium reflects in part the bond rating.
- 2 major bond rating agencies:
 - Moody's
 - Standard and Poor's

23

Comparisons



24

Tax Risk

- The Taxation of Security Gains and Income Affects the Yield Differences Among Securities
- The after-tax return, i_{at} , is found by multiplying the pre-tax return by one minus the marginal tax rate.

$$i_{at} = i_{bt}(1-t)$$

25

Should You Buy a Municipal or a Corporate Bond?

INVESTORS' MARGINAL TAX RATE	MUNICIPAL YIELD	CORPORATE AFTER-TAX YIELD
0%	7%	$10(1 - 0.00) = 10.0\%$
10	7	$10(1 - 0.10) = 9.0$
20	7	$10(1 - 0.20) = 8.0$
30	7	$10(1 - 0.30) = 7.0$
40	7	$10(1 - 0.40) = 6.0$
50	7	$10(1 - 0.50) = 5.0$

26

Liquidity Risk

- The easier, cheaper, faster that an asset can be converted into money (cash, credit in checking account)
- RIGHT NOW, Treasury bills, notes, and bonds are HIGHLY LIQUID ∴ a.k.a. "secondary reserves"

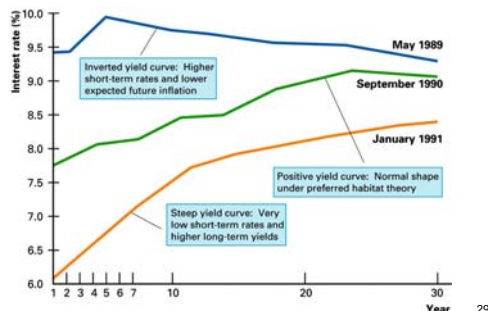
27

Yield Curve

- Term (Maturity) structure may be studied visually by plotting a yield curve at a point in time
- The yield curve may be ascending, flat, or descending.
- Several theories explain the shape of the yield curve.

28

Figure 7.7 Interpreting the Yield Curve



29

Observed Yield Facts

- Yields tend to move together over time (see graph)
- yield curves usually, but not always, slope upward
- when short-term rates are low, yield curves almost always slope upward, BUT when short term interest rates are high, yield curves are likely to slope downward

30

Explaining Yield Facts with Theories

- Theories are purported explanations of observed phenomenon.
- They are stories that try to describe WHY something happens the way it does.
- If they are “scientific,” those stories make testable predictions.
- If the predictions hold out, the theory is accepted until a better story comes along.
- If the predictions do not occur, scholars work on making better stories.

31

Three Theories of Yield Facts

1. Expectations Hypothesis
2. Segmented Markets Theory
3. Preferred Habitat and Liquidity Premium Theories

Which theory is best?

Which makes the best predictions about reality?

Which explains the three observed facts the best?

32

Expectations Hypothesis, I

- Assumption: bond buyers do not prefer bonds of particular maturities.
- ∴ Bonds of varying maturities are PERFECT SUBSTITUTES
- ∴ Interest rate on a long term bond will equal an average of short term interest rates expected over the life of the bond.
- EXAMPLE: I expected to be: 5, 6, 7%
- yield on 1 year bond = $5/1 = 5\%$
- on 2 year = $(5+6)/2 = 5.5\%$
- on 3 year = $(5+6+7)/3 = 6\%$

33

Expectations Hypothesis, II

- Explains/predicts:
 - why yields move together
 - long term yields calculated from short term ones
 - why yield curves slope downward when short-term rates are high
 - when short term rates are high, people expect short term rates to fall in the future
 - 10, 10, 4; 3 year yields = $24/3 = 8 < 10$ on 1 and 2 year notes
- Fails to explain/predict:
 - why yield curves tend to slope upward
 - short term rates are just as likely to rise as to fall, so slope should usually be flat

34

Segmented Markets Theory

- Assumption: Bonds of different maturities are NOT SUBSTITUTES AT ALL
- ∴ Bond prices/yields at each maturity are solely a f(supply & demand) of bonds of that exact maturity
- Explains why the yield curve slopes upward:
 - investors usually want short term bonds
- Cannot explain why:
 - prices move together
 - yield curve inversion

35

Preferred Habitat and Liquidity Premium Theories, I

- Combine the Expectations Hypothesis and the Segmented Markets Theory
- Assumption: Bonds of different terms to maturity are substitutes, but not perfectly so
- In other words, investors PREFER a particular maturity but will change if the rewards are large enough
- Investors usually PREFER shorter terms and ∴ that longer bonds must offer a + premium to attract investors

36

Preferred Habitat and Liquidity Premium Theories, II

- Equation: Average short term rates + term premium
- Example: 6, 8, 10% expected; investors need 0%, 1% and 1% premium to hold 1, 2 and 3 year note
- $(6+8+10)/3+1 = 8+1 = 9\% = 3$ year
- $(6+8)/2+1 = 8\% = 2$ year
- $6 = 6\% = 1$ year

37

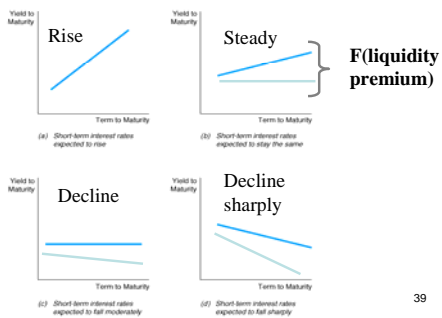
Preferred Habitat and Liquidity Premium Theories, III

- Explain all three yield facts:
- Yields move together:
 - short term yields used to calculate long term yields
- Yield Curve inversion when short term rates are high
 - short term rates expected to fall
- Yield curves usually slope upward
 - positive premium needed to compensate long term bond holders

38

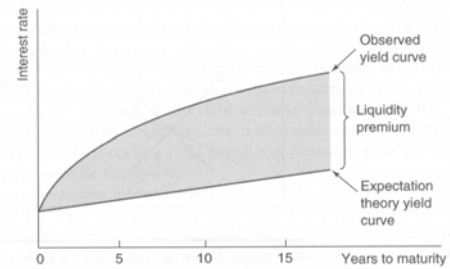
Who Cares?: We Do! Why?

- Yield curves are the market's prediction about future short term interest rate movements.



39

In other words ...



40