

CHAPTER 5

The Behavior of Interest Rates

Why does the nominal interest rate fluctuate?

- Chapter 4: negative relation between Bond prices and the interest rate.
- Here: Why do bond prices change?
- How: use supply and demand, i.e., the theory of asset demand, the supply and then the market equilibrium.
- Asset market approach: based on stocks, not flows.

Determinants of Asset Demand Theory of Asset Demand

SUMMARY Table 1 Response of the Quantity of an Asset Demanded to Changes in Wealth, Expected Returns, Risk, and Liquidity

Variable	Change in Variable	Change in Quantity Demanded
Wealth	↑	↑
Expected return relative to other assets	↑	↑
Risk relative to other assets	↑	↓
Liquidity relative to other assets	↑	↑

Note: Only increases in the variables are shown. The effect of decreases in the variables on the change in demand would be the opposite of those indicated in the rightmost column.

Derivation of Bond Demand Curve

$$i = RET^e = \frac{(F - P)}{P}$$

At Point A: Interest rate = yield to maturity = expected return (no uncertainty).

$$P = \$950$$

$$i = \frac{(\$1000 - \$950)}{\$950} = 0.053 = 5.3\%$$

$$B^d = \$100 \text{ billion}$$

Derivation of Bond Demand Curve

Point B:

$$P = \$900$$

$$i = \frac{(\$1000 - \$900)}{\$900} = 0.111 = 11.1\%$$

$$B^d = \$200 \text{ billion}$$

Point C: $P = \$850, i = 17.6\%, B^d = \300 billion

Point D: $P = \$800, i = 25.0\%, B^d = \400 billion

Point E: $P = \$750, i = 33.0\%, B^d = \500 billion

Demand Curve is B^d in Figure 1 which connects points A, B, C, D, E.

Has usual downward slope

Derivation of Bond Supply Curve

Point F: $P = \$750, i = 33.0\%, B^s = \100 billion

Point G: $P = \$800, i = 25.0\%, B^s = \200 billion

Point C: $P = \$850, i = 17.6\%, B^s = \300 billion

Point H: $P = \$900, i = 11.1\%, B^s = \400 billion

Point I: $P = \$950, i = 5.3\%, B^s = \500 billion

Supply Curve is B^s that connects points F, G, C, H, I, and has upward slope

Factors that Shift the Bond Demand Curve

1. Wealth

- A. Economy grows, wealth \uparrow , B^d shifts out to right

2. Expected Return

- A. i \downarrow in future, R^e for long-term bonds \uparrow , B^d shifts out to right
 B. π^e \downarrow , Relative R^e \uparrow , B^d shifts out to right
 C. Expected return of other assets \uparrow , B^d \uparrow , B^d shifts out to right

3. Risk

- A. Risk of bonds \downarrow , B^d \uparrow , B^d shifts out to right
 B. Risk of other assets \uparrow , B^d \uparrow , B^d shifts out to right

4. Liquidity

- A. Liquidity of Bonds \uparrow , B^d \uparrow , B^d shifts out to right
 B. Liquidity of other assets \downarrow , B^d \uparrow , B^d shifts out to right

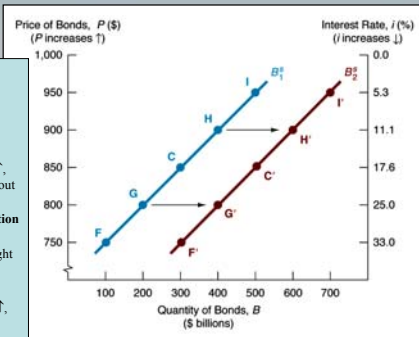
Factors that Shift Demand Curve for Bonds

Variable	Change in Variable	Change in Quantity Demanded	Shift in Demand Curve
Wealth	\uparrow	\uparrow	B^d (increases \rightarrow)
Expected interest rate	\uparrow	\downarrow	B^d (decreases \leftarrow)
Expected inflation	\uparrow	\downarrow	B^d (decreases \leftarrow)
Relative risk of bonds relative to other assets	\uparrow	\downarrow	B^d (decreases \leftarrow)
Liquidity of bonds relative to other assets	\uparrow	\uparrow	B^d (increases \rightarrow)

Note: Panel (a) shows an increase in expected inflation. From the left vertical axis, as we go up the axis, while the right vertical axis increases. As we go down the axis, the right vertical axis decreases. The effect of increases in the variables on the right is to increase demand for the quantity of bonds indicated on the remaining columns.

Shifts in the Bond Supply Curve

- Profitability of Investment Opportunities**
 Business cycle expansion, investment opportunities \uparrow , B^s \uparrow , B^s shifts out to right
- Expected Inflation**
 π^e \uparrow , B^s \uparrow , B^s shifts out to right
- Government Activities**
 Deficits \uparrow , B^s \uparrow , B^s shifts out to right



- Equating supply and demand for bonds as in loanable funds framework is equivalent to equating supply and demand for money as in liquidity preference framework
- Two frameworks are closely linked, but differ in practice because liquidity preference assumes only two assets, money and bonds, and ignores effects on interest rates from changes in expected returns on real assets

Liquidity Preference Analysis

Derivation of Demand Curve

- Keynes assumed money has $i = 0$
- As $i \uparrow$, relative RET^e on money \downarrow (equivalently, opportunity cost of money \uparrow) $\Rightarrow M^d \downarrow$
- Demand curve for money has usual downward slope

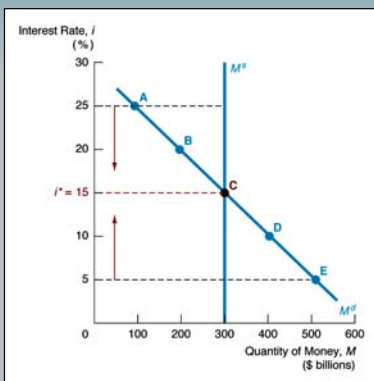
Derivation of Supply curve

- Assume that central bank controls M^s and it is a fixed amount
- M^s curve is vertical line

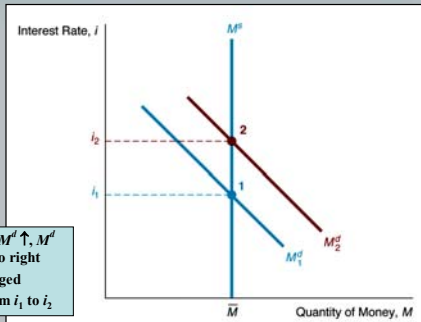
Market Equilibrium

- Occurs when $M^d = M^s$, at $i^* = 15\%$
- If $i = 25\%$, $M^s > M^d$ (excess supply): Price of bonds \uparrow , $i \downarrow$ to $i^* = 15\%$
- If $i = 5\%$, $M^d > M^s$ (excess demand): Price of bonds \downarrow , $i \uparrow$ to $i^* = 15\%$

Money Market Equilibrium



Rise in Income or the Price Level

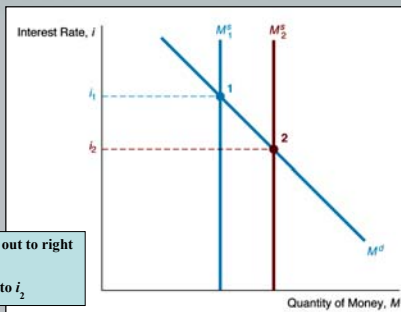


1. Income \uparrow , $M^d \uparrow$, M^d shifts out to right
2. M^s unchanged
3. i^* rises from i_1 to i_2

© 2004 Pearson Addison-Wesley. All rights reserved.

5-22

Rise in Money Supply



1. $M^s \uparrow$, M^s shifts out to right
2. M^d unchanged
3. i^* falls from i_1 to i_2

© 2004 Pearson Addison-Wesley. All rights reserved.

5-23

GENERAL Table 4 Factors That Shift the Demand for and Supply of Money

Variable	Change in Variable	Change in Money Demand (M^d)	Change in Interest Rate
Income	\uparrow	$M^d \uparrow$	\uparrow
Price level	\uparrow	$M^d \uparrow$	\uparrow
Money supply	\uparrow	$M^s \uparrow$	\downarrow



Note: Only increases in the variables are shown. The effect of decreases in the variables on the change in demand would be the opposite of those indicated in the remaining columns.

5-24

Money and Interest Rates

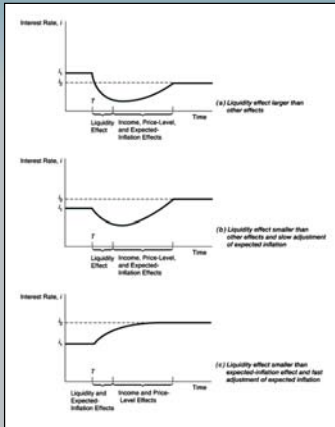
Effects of money on interest rates

1. Liquidity Effect
 $M^s \uparrow$, M^d shifts right, $i \downarrow$
2. Income Effect
 $M^s \uparrow$, Income \uparrow , $M^d \uparrow$, M^d shifts right, $i \uparrow$
3. Price Level Effect
 $M^s \uparrow$, Price level \uparrow , $M^d \uparrow$, M^d shifts right, $i \uparrow$
4. Expected Inflation Effect
 $M^s \uparrow$, $\pi^e \uparrow$, $B^d \downarrow$, $B^s \uparrow$, Fisher effect, $i \uparrow$

Effect of higher rate of money growth on interest rates is ambiguous

1. Because income, price level and expected inflation effects work in opposite direction of liquidity effect

Does Higher Money Growth Lower Interest Rates?



Evidence on Money Growth and Interest Rates

