Supply and Demand for Assets

Economics 301: Money and Banking

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1.1 Goals

Learning Outcomes

- LO3: Predict changes in interest rates using fundamental economic theories including present value calculations, behavior towards risk, and supply and demand models of money and bond markets.
- LO4: Describe how interest rates, interest rate risk, and expectations of future interest rates affect decisions made by consumers and financial institutions.

1.2 Reading

Reading

- Read Hubbard and O'Brien, Chapter 4.

2 Demand for Bonds

2.1 Demand Curve

Demand for Bonds

- For simplicity, focus on discount bonds.
- The **quantity demanded** for bonds is the total face value of all bonds lenders/savers are willing and able to purchase at given bond prices.
- **Demand curve/schedule** for bonds is a figure or table that illustrates the quantity demanded for bonds for given bond prices.
- **Law of demand for bonds:** The quantity demanded for bonds increases as the rate of return on holding bonds increases.

Price versus Interest Rate

Yield to maturity, i, on a discount bond, face value, F, maturity date, T, and price, P:

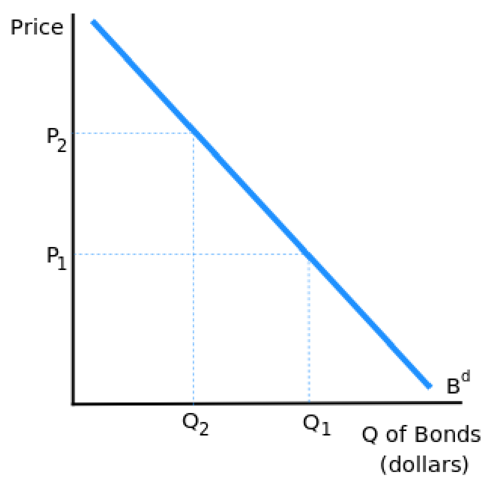
$$P = \frac{F}{(1+i)^T}$$

$$(1+i)^T = \frac{F}{P}$$

$$1 + i = \left(\frac{F}{P}\right)^{1/T}$$

Demand Curve for Bonds

- Interest rate is inversely proportional to the price of the bond.
- Law of demand for bonds implies the demand curve will be downward sloping.



2.2 Determinants of Demand

Determinants of Asset Demand

- When something *besides the price of the bond* affects the demand for bonds, we say there is a **change in demand** or a **shift in demand**
- Wealth: total value of all resources owned by an individual, including all assets.
  - An increase in wealth shifts the demand for bonds to the right.
- Expected return: changes in expectations of returns for given asset *and related assets.*

- Risk: degree of uncertainty regarding the return of an asset (includes interest and capital gains).
- Liquidity: ease and speed to which an asset can be converted to a means of payment.
  - An increase in liquidity causes an increase in demand for an asset.

Expected Return

- Expected return: weighted average of all possible cash flows for an asset.
- Example: suppose a discount bond with one year maturity is sold for \$120, there is a 15% chance that an issuer of a discount bond will default, and an 85% chance the issuer will pay the face value of \$150.

$$P = \frac{F}{1+i}, \qquad 1+i = \frac{F}{P}$$

  - Return if default $\equiv R_d = 0$
  - Return if no default $\equiv R = 150/120 - 1 = 0.25$
  - Expected return $\equiv R^e = 0.15(0) + 0.85(0.25) = 0.2125$.
- An increase in expected return relative to other assets increases demand for the asset today.
- An increase in expected return for alternative assets decreases demand for the asset today.

Expected Return

- Previous example assumed asset was held through maturity date, so rate of return = yield to maturity.
- Suppose you expect interest rates to rise.
  - What do you expect will happen to the price of the bond?
  - What do you expect will happen to capital gains on the bond?
  - What does effect does this expectation have on *today's* demand for the bond?
- Expected Return should consider *real* return, not *nominal return.*
  - What would happen to the demand for a bond if there is an increase in expected inflation?

Risk

- **Risk averse:** a lender/saver is risk averse if he/she is willing to accept a lower expected return for an asset that has greater *certainty* for the rate of return.
- **Risk neutral:** a lender/saver is risk averse if uncertainty regarding a return *does not affect* the demand for an asset. Only expected return is considered important.
- **Risk loving:** a lender/saver is risk loving if he/she is willing to accept a lower expected return for an asset that has greater *uncertainty* for the rate of return.
- Assuming risk averse lenders/savers, an increase in the risk of an asset causes a decrease in the demand for the asset.

3 Supply for Bonds

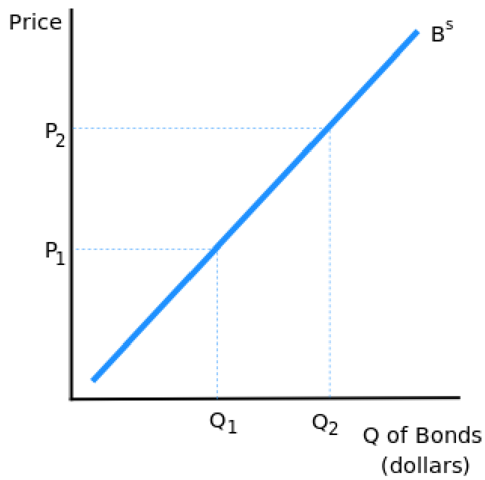
3.1 Supply Curve

Supply for Bonds

- The **quantity supplied** for bonds is the total face value of all bonds borrowers/issuers are willing and able to sell at given bond prices.
- **Supply curve/schedule** for bonds is a figure or table that illustrates the quantity supplied for bonds for given bond prices.
- **Law of supply for bonds:** The quantity supplied for bonds decreases as the rate of return on holding bonds increases.

Supply Curve for Bonds

- Law of supply for bonds implies the demand curve will be downward sloping.



3.2 Determinants of Supply

Determinants of Supply

- When something *besides the price of the bond* affects the supply for bonds, we say there is a **change in supply** or a **shift in supply**.
- An increase in expected profitability of investment opportunities increases the supply of bonds.
  - A recession decreases the profitability of businesses, causes a decrease in supply of bonds.
- Expected inflation: an increase in inflation decreases the real purchasing power of the cash flow.
  - An increase in expected inflation causes an increase in the supply of bonds.
- Government budget: when Federal government runs a budget deficit, they sell government bonds, increasing the supply of bonds.

4 Equilibrium

Equilibrium

- Equilibrium quantity and price (and therefore interest rate) are determined by intersection of supply and demand curves.
- Predict how quantity of bonds, price of bonds, and interest rates will change if...

- the Federal Reserve sells reserves of Treasury bills on the open market.
- there is a break down in financial markets that makes it more difficult to buy and sell bonds on the secondary market.
- people expect the economy will very soon be recovering from a recession.
- people expect the Federal Reserve will soon be raising interest rates.
- people start to suspect the Federal Reserve will be unable to effectively control interest rates.

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5.1 Next Topic

Next Topic

- Chapter 5: More on behavior of interest rates: term structure of interest rates.