# Money market

#### Money market

- Debt instruments with original maturity of one year or less
- Issued by economic agents requiring short-term funds
- Purchased by economic agents with excess short-term funds
- Once issued, trade in active secondary markets

#### Money market

- Excessive cash holdings involve opportunity cost
- Cash gets zero interest
- Money market instrument provides an investment opportunity that generates a higher rate of interest than holding cash.

## Money market instruments

- Sold in large denominations
- Prohibitive for individual investors
- Individuals invest indirectly through money market mutual funds

#### Money market instruments

- Issued by high quality borrowers
- Low default risk
- Default risk is late or non-payment of principal or interest

## Money market instruments

• Original maturity of one year or less

# Yields on money market securities

# Bond equivalent yields

- Quoted nominal or stated rate earned on an investment over a one-year period.
- Does not consider the effects of compounding of interest during a less than one year investment horizon.
- Is the rate used to calculate the present value of an investment

#### Bond equivalent yields

 Compare discount securities to U.S. Treasury bonds with bond equivalent yields (i<sub>bey</sub>)

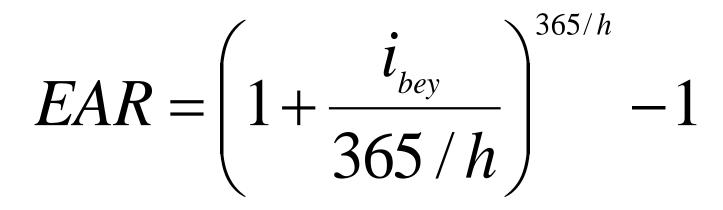
$$i_{bey} = \frac{(P_f - P_0)}{P_0} \times \frac{365}{h}$$

 $P_f$  = Face value  $P_0$  = Purchase price of the security h = Number of days until maturity

#### Effective annual return

- Bond equivalent rate does not consider the effects of compounding
- If interest is paid more than once year, true annual rate earned is effective annual return on an investment
- Bond equivalent yield on money market securities with a maturity of less than one year can be converted to an EAR

#### Effective annual return



# **Discount yields**

- Some money market instruments are bought and sold on a discount basis (e.g., Treasury bills and commercial paper)
- P<sub>0</sub> is the purchase price at a discount from its face value at time 0
- P<sub>f</sub> is the face value received at maturity

#### Money market yields

For discount yields, use 360 days

$$i_{dy} = \frac{(P_f - P_0)}{P_f} \times \frac{360}{h}$$

 $P_f$  = Face value  $P_0$  = Purchase price of the security h = Number of days until maturity

Comparison of discount yields and bond equivalent yields

• 
$$I_{bey} = i_{dy} (P_f / P_0) (365 / 360)$$

# Single payment yields

- Some money market securities, e.g. jumbo CDs and fed funds) pay interest only once during their lives , at maturity
- At maturity investor gets interest + maturity
- Single payment yield assumes 360 days

Single payment yields  
• 
$$i_{bey} = i_{spy} (365/360)$$

$$EAR = \left(1 + \frac{i_{spy}(365/360)}{365/h}\right)^{365/h} - 1$$

$$EAR = \left(1 + i_{bey} / (365 / h)\right)^{365 / h} - 1$$

#### Money market securities

# Treasury bills

- Short-term obligation issued by government
- To cover current government budget deficit and to refinance maturing government debt
- Original maturities are 13 weeks or 26 weeks
- Denominations of multiples of \$1,000
- Default risk-free often referred to as risk-free asset

# Treasury bills

- Discount security
- Zero-coupon security
- Return is the difference between the purchase price and the face value received at maturity

#### Federal funds

- Short-term funds transferred between financial institutions, usually for a period of one day
- Federal funds rate is the interest rate for borrowing federal funds

#### Repurchase agreements

• An agreement involving sale of securities by one party to another with a promise to repurchase the securities at a specified price and on a specified date

#### Reverse repurchase agreement

- An agreement involving the purchase of securities by one party from another with the promise to sell them back
- Haircut: Collateral is valued at slightly less than the market value
- Reflects the risk of the underlying
- Specific to security

# **Commercial paper**

- An unsecured short-term promissory note issued by a company to raise short-term cash, often to finance working capital
- Generally not actively traded as unsecured
- Credit ratings are obtained

# Negotiable certificates of deposit

- A bank-issued
- Fixed maturity
- Interest-bearing time deposit
- That specifies
- An interest rate and maturity date
- Is negotiable
- Denominations range from \$100,000 to \$10 million.

# Negotiable certificates of deposit

- Bearer instrument:
- An instrument in which the holder at maturity receives the principal and interest.

#### Banker's acceptances

• A time draft payable to a seller of goods, with payment guaranteed by a bank

# Comparison of money market securities

- Common features:
- Large denominations
- Low default risk
- Short maturities
- Differences:
- Liquidity

# Money market participants

- Government
- Central bank
- Commercial banks
- Money market mutual funds
- Brokers and dealers
- Corporations
- Other financial institutions like insurance companies
- Individuals

# Class problems

• 1, 3, 2, 10

#### Home work

#### • 4, 5, 8, 11, 12