**T-Bills**

* T-Bills
  + T-notes have maturities longer than 1 year, up to 10 years
  + T-bonds have maturities of 10+ years
  + Maturities
    - 28 days (1 month)
    - 91 days (3 months)
    - 182 days (6 months)
    - 364 days (1 year)
  + Highly liquid
    - Liquidity: able to sell an asset quickly and at a known price
  + Issued in weekly auctions
    - Competitive and non-competitive bids
  + Zero coupon
    - Sold at discount to maturity value
  + Most common denomination is $10,000
* T-Bill Example

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Maturity | Bid | Asked | Change | Asked Yield |
| 11/2/2017 | 0.933 | 0.923 | 0.055 | 0.935 |
| 11/9/2017 | 0.938 | 0.928 | 0.055 | 0.941 |

* What does it mean?
  + T-bills are quoted in percentage terms
    - The quote represents the yield implied by the price you are buying and selling at
    - The Bid and Asked are calculated using the bank discount method
      * The Asked Yield recalculates the Asked using the bond equivalent yield method
      * Change represents the change in yield for this particular bond vs. the previous day
* Bank Discount Method
  + Bid and Asked prices are quotes using this method
  + 2 differences from normal:
    - Reported as a % of par value($10,000)
    - Discount from par is “annualized” based on a 360 day year
* Bank Discount Method: Getting the Price
  + The discount is the difference in par value and price
  + So we can find price by solving for the discount:
* Bond Equivalent Yield
  + Need to convert the discount rate in order to compare to a bond
  + Bond yield calculated on an APR method:
  + Note:
    - 365 day year
    - Discount from price, not par
* Effective Annual Yield
  + Bond equivalent yield is an APR method
  + Convert to EAY:
  + Also referred to as:
    - Effective annual rate (EAR)
    - Annual percentage yield (APY)
* Example: Price
  + Consider the 11/30 T-bill quote:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Maturity | Bid | Asked | Change | Asked Yield |
| 11/30/2017 | 0.988 | 0.988 | 0.013 | 1.002 |

* + What price would an investor have paid to buy the T-bill on 10/31/2017?
  + What is the bond equivalent yield?
  + What is the effective annual yield?
* Example: Bank Discount Rate
  + Consider a T-bill with 90 days to maturity currently priced at $9,980. What is the bank discount rate?
* Ex. BEY and EAY
  + Consider the same T-bill with 90 days to maturity currently priced at $9,980. What is the BEY and EAY?