# Introduction to the U.S. Capital Markets

## EXAM

### T-Bill

- T-Bill $1,000,000 of 3/28/2018 T-Bills is issued, purchased for value @9/28/2017 at a 0.5% discount rate
- **Treasury Bills**
  - $= Maturity\ Amount - Discount\ Account$
  - $= Maturity\ Amount - Maturity\ amount \times Discount\ rate \times \frac{\#of\ Days\ to\ Marutrity}{360}$
  - $= \$1,000,000 - 1,000,000 \times 0.5\% \times \frac{181}{360}$
  - $= 997,486.11$

### T-Bond

- U.S T-Bond, 4 5/8, of 2/15/2040, settle at 9/9/2015 @130-24
  - $FV = \$1,000,000$
  - $Couponrate = 4.625\% = (4 + \frac{5}{8})\%$
  - $Price = 130\frac{24}{32} = 130.75$
- **Treasury Bond**(所有bond 都是半年付息一次)
  - $= Principal + Accrued\ Interest$
  - $= FV \times \frac{Price}{100} + FV \times \frac{coupon}{2} \times \frac{\#actual\ days\ from\ last\ coupon\ paying\ dates}{\#actual\ days\ btw\ 2\ coupon\ paying\ dates}$
  - $= 1,307,500 + 1,000,000 \times \frac{4.625\%}{2} \times \frac{9/9/2015 - 8/15/2015}{2/15/2016/- 8/15/2015}$
  - $= 1,307,500 + 1,000,000 \times \frac{4.625\%}{2} \times \frac{25}{180+4}$
  - $= 1,310,641.98$

### Coporate Bond

- IBM, 5%, 06/20/2042, settle at 9/11/2015 @94.718
  - FV = $1,000,000
  - coupon paying dates 06/20, 12/20
  - Sell at 6/11/2016 @90

- **Coporate Bond**
  - $= Principal + Accrued\ Interest$
  - $= FV \times Price/100 + FV \times \frac{Coupon\ rate}{2} \times \frac{\#dates30}{\#days180}$
  - $= 1,000,000 \times \frac{94.718}{100} + 1,000,000 \times \frac{5}{2} \times \frac{81}{180}$
  - $= 958,430.00$
  - (Holding Period Return)
  - $HPR = \frac{Settle@T_2 - Settle@T_1 + coupon\ received\ btw\ T_1 + T_2}{Settle@T_1}$
    - $= \frac{Principal + AI - 958{,}430 + 25{,}000}{958{,}430}$
    - $= -1.0100\%$ for 270days
  - $Anatualized\ return = \frac{HPR}{\frac{\#days\ of\ the\ holding\ period}{\#days\ of\ a\ year}} = \frac{-1.01\%}{3/4} = -1.3466\%$