Advanced Managerial Finance-- BA 519
Review of Time Value of Money & Bond Valuation

Future/Present Value of Lump-Sum/Annuities; Non-Annual Compounding, Bond Valuation. Usage of Financial Calculator
Texas Instruments BAII Plus

Calculator Settings:
- Set Decimal Places: 9 (or your choice) \{Format: 2nd, .\}
- Payments/year: 1 \{P/Y: 2nd, I/Y\}

CLR TVM \{2nd, FV\}
- Clears all the entries in the time value registers (keys in the 3rd row)

CLR Work \{2nd, CE/C\}
- Clears whichever spreadsheet you are in
Texas Instruments BAII Plus

- **ENTER**
  - It is essential to press “enter” for calculator to accept your numbers

- **CPT**
  - To compute the unknown variable in the problem

- **Inflows (+) and Outflows (-)**

- **In TV of money problems, at least one CF has to be ‘+’ and one ‘-’**
Future Value (FV) / Present Value (PV)

If I pay you $100 today and another $100 in 1 year, how much total money will you have at the end of the 1st year? $200???

NO!!

- Can’t compare/add/subtract money in different time periods!

What is the FV of $235 @ 12% for:
- 1 year? ($263.20)  
- 4 years? ($369.78)

Simple interest vs. compound interest
Future Value (FV) / PV -- Continued

- Manhattan for sale for $24!!!!
  - Indians received that in 1626 in Goods & Trinkets
- FV (378 years, 8%) = $103,369,100,000,000!!
  - Enough to buy the whole world….
  - Simple interest on $24 for 378 years = $725.76!!
- The difference between simple interest and compound interest increases exponentially with time

PV or Discounting

- PV of $145 to be recd. in 5 yrs. 8% ($98.68)
Multiple Cash Flows, Compounding Periods

An investment offers CFs of $300, -200, & -100 starting at T=0; 10%;

- Good investment?
- YES, NPV = $35.54

{Use CF worksheet: CF0 = $300, C01= -$200, F01 = 1,
  C02 = -$100, F02 = 1; Go to “NPV,” I = 10%, ↓ CPT NPV}

FV of $100 in 1 year @12% compounded Annually? ($112.00)

FV of $100 in 1 year @12% compounded Semi-Annually? ($112.36)
Multiple Cash Flows, Compounding Periods--Continued

- **EAR**: Rate on an annual basis that **REFLECTS** compounding effects;

  \[ \text{EAR} = \left( 1 + \frac{r}{m} \right)^m - 1; \quad \text{FV} = C_0 \times \left( 1 + \frac{r}{m} \right)^{mT} \]

- **EAR of @12% comp. monthly?** (12.68%)
  
  \{2nd, IConv (2nd function of number 2); 2nd CLR Work; NOM = 12, ↑, C/Y = 12, ↑, CPT EFF\}
Multiple Cash Flows, Compounding Periods—Even More!

- Receive $100 in year 1, $300 in years 2 & 3, and - $50 in year 4; Find PV @ 10%
- FV of $300 in 4 yrs. @12% compounded monthly?
- PV of $400 to be received in 3 yrs. @11% compounded daily?
- EAR of @14% compounded quarterly?
- FV of $100 in 2 yrs. @12% continuously compounded?
Annuities and Perpetuities

Annuity: A series of *equal cash flows* at *equal intervals of time*.

Perpetuity: an infinite annuity; PV? FV?
PV = \( \frac{C}{r} \)

Growing Perpetuity: PV = \( \frac{C}{(r-g)} \)
- C is the CF 1 period from today
- In real-world, can the CFs actually grow @ constant rate forever?
How to Value Bonds?

Bonds (0 coupon, level coupons & Consols)
Valuation-- Bonds

Value of any Asset:
- PV of all future cash flows (FCFs)
  - need estimate of FCFs & discount rate

Bond: a long-term IOU

Discount (0 coupon) bonds
- FCF is face value (F) to be received in ‘T’ yrs.
  Bond Value = F/(1+r)^T
Bonds-- Continued

🌟 **Level Coupon Bonds.** FCFs:

1. coupons every period till maturity (annuity)
2. face value at maturity (lump-sum)

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Coupon  Coupon  Coupon  + F

🌟 **Consols:** Coupon bonds with no maturity; I.e., Perpetuity
Additional Bond Concepts

r: YTM (Yield to Maturity)
- rate of return required by the investors
- as \( r \) ↑ , \( P \) ???

Coupon rate fixed at the time of the issue;
‘r’ (discount rate/YTM) changes with time
- 10% coupon, 20 yrs. maturity
  - \( r = 12\% \), value = ?; Discount bond; YTM>C
  - \( r = 8\% \), value = ?; Premium bond; YTM<C
Bond Concepts-- Contd.

- $r=10\%$, value $= ?$; Par; YTM $= C$
- 7\% coupon, 10 Y. bond for $932.90$
- YTM $= ??$
- Semiannual Coupons
- 14s of December 2014 selling for 110 on July 1, 2003