

**Excel Tutorial**  
**Session 4**  
**Goal Seek and Solver**

# *Overview*

- Purpose—Ensure that all finance majors have Excel skills necessary for upper div. courses.
- Session 1: Basic Excel Operations
  - spreadsheet functionality, reference cells, formatting, linking spreadsheets, paste special, equation syntax.
- Session 2: Time value of money
  - bond pricing, financial functions
- Session 3 Data Analysis Tools
  - solver, regression
- Assignments - Each session is ~30 min
  - Complete individually
  - Submit through RamCT for grading.

# *Time value of Money*

- Use F1 (help) liberally!!
  - “F1” search for “functions”
    - select “list of functions”
    - Select “financial functions”
  - Select “Formulas” then “insert function”
- Particularly useful:
  - Rate, PMT, PV – for periodic cash flows.
  - Yield, Price, Duration, Mduration – for bonds in particular.
- Open a spreadsheet
  - Save the spreadsheet as lastname\_first\_excel2.xlsx.

## *Excel – optimization tools*

- Example – TIPS are Treasury bonds that are “protected” against inflation. A TIP with a 2% “real coupon” will pay a coupon equal to 2% of the CPI “inflation adjusted” principle.
  - If inflation is expected to be 3% annually, then principle increases by 3% per year.
  - The coupon is always 2% of infl adjusted principle.

# *Treasury Inflation Protected Securities*

- TIPS are Treasury bonds that are “protected” against inflation.
- Ex: 5-year TIP with 2% coupon. Inflation is expected to be 4%.
  - Adj principle grows at 4% per year (rate of inflation) .
  - Coupon is 2% of adj principle.
  - Cash flow is each coupon plus adj principle in the 5<sup>th</sup> year.
  - Find price, given some yield, by using the =NPV function.

<b>John Elder Fin 310</b>						
YTM	7.00%					
Expected Inflation	4.00%					
Real Coupon	2.00%					
	0	1	2	3	4	5
Adj Principle		1040.00	1081.60	1124.86	1169.86	1216.65
Coupon		20.80	21.63	22.50	23.40	24.33
Cash Flow		20.80	21.63	22.50	23.40	1240.99
Price of bond	\$959.35					

## *Using Excel's "numerical analysis" tools.*

- Question: What yield will cause this bond to trade for par?
  - (1) We could think of an intuitive answer.
  - (2) We could change "YTM" until desired result appears.
  - We could ask Excel to systematically do #2 above.
- Goal Seek - If you know the result that you want from a formula, but are not sure what input value induces that result.
  - What YTM will cause this bond to trade for par?
  - What YTM will cause this bond to trade for \$900?
- What is the greatest possible bond price, given that the yield must be greater than 6% (maybe some corp bond) and expected inflation must be between -1% and 3%? (Fed's target).
  - Need more sophisticated version of Goal Seek. Solver!
  - "Office Button" / "Properties" / "Excel Add-ins" / "Solver"

## *On your own.....*

- On your own: Consider a 10-year TIP with 2% coupon. Inflation is expected to be 3%.
  - What YTM (constant discount rate) will cause this bond to trade for par?
  - What YTM (constant discount rate) will cause this bond to trade for \$900?
  - What is the greatest possible bond price, given that the yield must be greater than 6% and expected inflation must be between -1% and 3%?
- Put answers, in bold, on spreadsheet!
- Save spreadsheet as Lastname.firstname.xlsx and submit on RAMCT!