ECON 255 Spring 2022

Project 4: *Asset Portfolio Optimization*

*See the syllabus for more information about how I grade these assignments.*

**Planning for Retirement**

**Excel Functions Practiced:**

IF Statements

Nested IF Statements

VLOOKUP

SOLVER

The purpose of this exercise is to get you to think about the importance of saving and to help you get started saving sooner rather than later. The objective is to help you determine the amount of your annual income you will need to save to meet your financial goals in your golden years and to retire comfortably.

**The Setup:**

To accomplish this project, you will set up an Excel worksheet as shown in class, with assumed data given in Cells B4-B14, and the following labels in Cells C4-C14:

**Current Annual Income:** $49,000

**Assumed Real Annual Raise:** 2.00%

**Current Age:** 23

**Retirement Age: 72** (Assumes user retires at beginning of year—the age at which you will start to need income from your savings)

**Death Age**: 90 (Morbid, I know, but necessary!)

**Current Retirement Savings:** $2,500 (The amount of money you currently have saved for retirement purposes)

**Assumed Rate of Return:** 7.5%

**Assumed Inflation Rate:** 4.5%

**% of Current Income Needed During Retirement:** 75% (if you were to retire right now, what percentage of your income you would need to fully retire—the default is 75%. Most people agree you won’t need 100% of your salary to retire comfortably because you should pay off most of your main expenses (i.e., mortgage payments, other large loans, etc.) prior to retirement.

**Necessary Current Annual Income:** Calculated (Assumed withdrawn at beginning of year)

**% of Annual Income Contributed**: TBD (Assumed contributed at year’s end)

You will set up the following in columns F and G:

**Desired Savings at Death:** $150,000 How much money do you want to have on-hand when you pass away. Now you may say that you don’t want anything there because you can’t take it with you. While that’s true, you might also say that you want some money left to pass to your spouse or your children. Also, you might actually live longer than you expect, and this fund could represent your ‘contingency plan**’.**

**Actual Savings at Death:** Calculated

**Surplus/(Deficit):** Calculated

**Break Even Contribution Rate Using Solver:** Calculated

*Note: Highlight the cells where you enter assumed data in yellow. Cells highlighted in green will be calculated from your model.*

In the bottom section of the spreadsheet, you are to figure out for each year until you die what the cash coming into your savings will be, and what the cash flowing out of your savings will be. To set this up, you will enter the following labels beginning in Cells B16-I16.

**Beg. Age**

**Salary**

**Beg. Ret. Savings**

**Deposit (Assumed EoY)**

**Withdrawal (Assumed BoY)**

**Return**

**End. Ret. Savings**

**End Age**

Finally, use the Solver to finds the break-even contribution rate using the Solver function.

**The Write Up:**

1. Although I want you to use the numbers above to begin your analysis with, please feel at liberty to change various parameters and see what their effects are. Please describe the effects of changing the current annual income, real annual raid, retirement age, inflation rate, and assumed rate of return. Which parameters have the greatest effect on actual savings at death? Why?
2. The spreadsheet model, so far, assumes that your only source of income is salary. Modify the model to include a $30,000 bonus at age 65. How does this affect the model? How much does it affect actual savings at death if you invest it?
3. Suppose the Federal Reserve is working hard to reduce inflation through a series of interest rate increases. Choose a target inflation rate, for five years from now, that results from these increases. How does it affect your actual savings at death? The amount of income you need to save?
4. Describe your experience learning to use the Solver. Was this the first time you’ve used it? Was it helpful? Are there other ways to find the “breakeven contribution rate using solver”?

When you have completed the assignment, save it as RetCalc**InsertYourLastNameHere**.xlsm (i.e., RetCalcSmith.xlsm) and post it on I-Learn by the day and time noted on the course schedule. All grading will be based on the Project Grading Rubric from the syllabus and using the format given above and demonstrated in class--no other format is acceptable for grading purposes. **I do not accept late projects.**