Chapter 7
Labor Supply: Household Production, the Family, and the Life Cycle

1. Below is a description of the current State Teacher Retirement System of Ohio pension benefit.

**STRS Salary-related benefit**

The annual salary-related benefit (a life annuity at retirement) is calculated by multiplying your first 30 years of service credit by 2.2% of the final average salary (average of your three highest years of Ohio public earnings). The 31st year of contributing service credit is multiplied by 2.5% of the final average salary. An additional one-tenth of a percent is added to the calculation for every year of contributing service over 31 years (2.6% for the 32nd year, 2.7% for the 33rd year and so on) until 100% of the final average salary is reached.

Consider a person with 30 years of service at age 60 and a final average salary of $100,000. Assume life expectancy of 85 and assume that earnings would remain at $100,000 if the person continues working beyond age 60. Assuming that final average salary does not change and an interest rate of 0, how does postponing retirement from age 55 to age 56 affect:

a. the PV of the pension benefit (give a numerical value and show your calculation).

b. the PV of lifetime earnings (give a numerical value and show your calculation). When Professor Even arrived at Miami University, all years were credited with 2% (not 2.2% as now) per year of service. The credit did not increase beyond age 30.

c. For the person described above, draw budget constraints for a retirement age that begins at age 55 and may be as high as 75 for the “new” and “old” systems without providing numerical detail.

d. For a person that retired at age 55 under the old program, is it possible to say whether the change would be more likely to cause an earlier or later retirement date? Explain with reference to income and/or substitution effects. How does your answer change (if at all) for a person who retired at age 65 under the old program?

e. An important complication in our analysis of pension benefit formulas is that postponing retirement by a year will typically affect the “final average salary” which is based on the highest three years of earnings. (This was assumed away in the earlier part of the question). Given that higher inflation is generally associated with higher nominal wage growth, how would the slow down of inflation that has occurred over the past few decades affect the incentive to retire? Explain by describing the effect on the budget constraints you drew above.

f. Explain how and why the recent switch to defined contribution plans would affect the incentive to retire.
2. Under the current Social Security system, any person born in 1937 or earlier who retires at age 62 will receive 80 percent of the "full" Social Security benefit that would have been received if they waited until age 65. If retirement is postponed from 62 to 63, the retiree would increase from 80 to 87% of the full benefit.

a. Assuming a zero percent interest rate and life expectancy of age 80, is Social Security providing more or less than the "actuarially" fair increment in benefits? To justify your answer, indicate what the actuarially fair adjustment is (ASSUME 0% INTEREST IN YOUR CALCULATION.)

b. If the interest rate is positive, would the actuarially fair adjustment rise or fall? Explain why.

c. If the person’s life expectancy increased, would the actuarially fair adjustment rise or fall? Explain why.

d. Suppose that the Social Security formula was changed so that the benefit for retirement at age 62 is only 70% of that received at age 65, and the benefit at age 63 is 80% of that received at age 65. Demonstrate the effect of switching to this "new" program on the lifetime budget constraint (pv of lifetime wealth on vertical axis; retirement age on horizontal). Note that at age 65, the old and new system provide the same benefit.

e. If someone previously retired at age 63 under the "old" system, will the change described above likely lead to earlier or later retirement? Explain by pointing out the direction of any wealth or substitution effect of the change.

3. In the retirement age / pv of life-time wealth diagram, what does it say about a person’s preferences if they have a “flatter indifference” curves than typical? Will such people retire sooner or later than a person with steep indifference curves? Explain.

4a. Explain how the switch from defined benefit to defined contribution plans could have affected retirement behavior. Ignore the issue of financial risk in defined contribution plans in your discussion.

b. Explain how the switch from defined benefit to defined contribution plans could affect the retirement behavior of workers during recessions.