

Using data from Day & Newburger (2002) “The Big Payoff: Educational Attainment and Synthetic Estimates of Work-Life Earnings,” determine the Internal Rate of Return for each of the following scenarios. Fill in your results in the space below and then answer the questions at the bottom. Assume that EACH year the worker earns the same average wage as that reported in table.

Access the EXCEL file at

http://www.econ.iastate.edu/classes/econ321/Orazem/Prob_set2_EXCEL_EARNINGS_Profiles.xls

(SUGGESTION: It is probably worthwhile to make several copies of the two worksheets so that you can adjust the costs and incomes under the different scenarios without having to reload the EXCEL file).

Set up the program in Microsoft Excel. The formula for calculating the internal rate of return of a stream of payments is “=IRR(D2:D55)”, where the net payment in each period are in cells D2:D55 Two examples are shown, one for a male college graduate paying ISU in-state fees (assumed to be \$7000/year for four years) and working until age 65 (ie retires after 64) and another for a female college graduate paying ISU in-state fees and working until age 65. Place your estimated returns in space provided next to each scenario in Table 1. Details on the scenarios are presented below the table.

Table 1: Estimated internal rate of return to college under different college cost and labor force participation scenarios

Scenario	Internal rate of return
1) In-state fees, work every year until 65, male	12.05%
2) In-state fees, work every year until 65, female	11.29%
3) Nonresident fees, work every year until 65, male	
4) Nonresident fees, work every year until 65, female	
5) In-state fees, drop out of labor market in ages 30-39; work from age 40 until age 65, male, no human capital depreciation	
6) In-state fees, drop out of labor market in ages 30-39; work from age 40 until age 65, female, no human capital depreciation	
7) Nonresident fees, drop out of labor market in ages 30-39; work from age 40 until age 65, male, no human capital depreciation	
8) In-state fees, drop out of labor market in ages 30-39; work from age 40 until age 65, female, human capital depreciates 10% during time out and is never regained	

Scenarios 3 and 4, repeat the exercise in 1) and 2) but assume the tuition and fees are \$20,000 per year for four years. Compute the internal rates of return.

Scenarios 5 and 6 repeat 1) and 2) except that the individual does not work from ages 30 to 39. Upon reentry, the earnings stream resumes where they left off. To be clear, earnings at age 40 are those they would have had at 30, earnings at 41 are those at 31, and so on until they retire. Compute the internal rate of return.

Scenario 7) repeats scenario 5) except with nonresident fees of \$20,000. Compute the internal rates of return.

Scenario 8) repeats scenario 6) except the salary on reentry is 10% less every year after reentry. There is no depreciation before exit. Compute the internal rates of return.

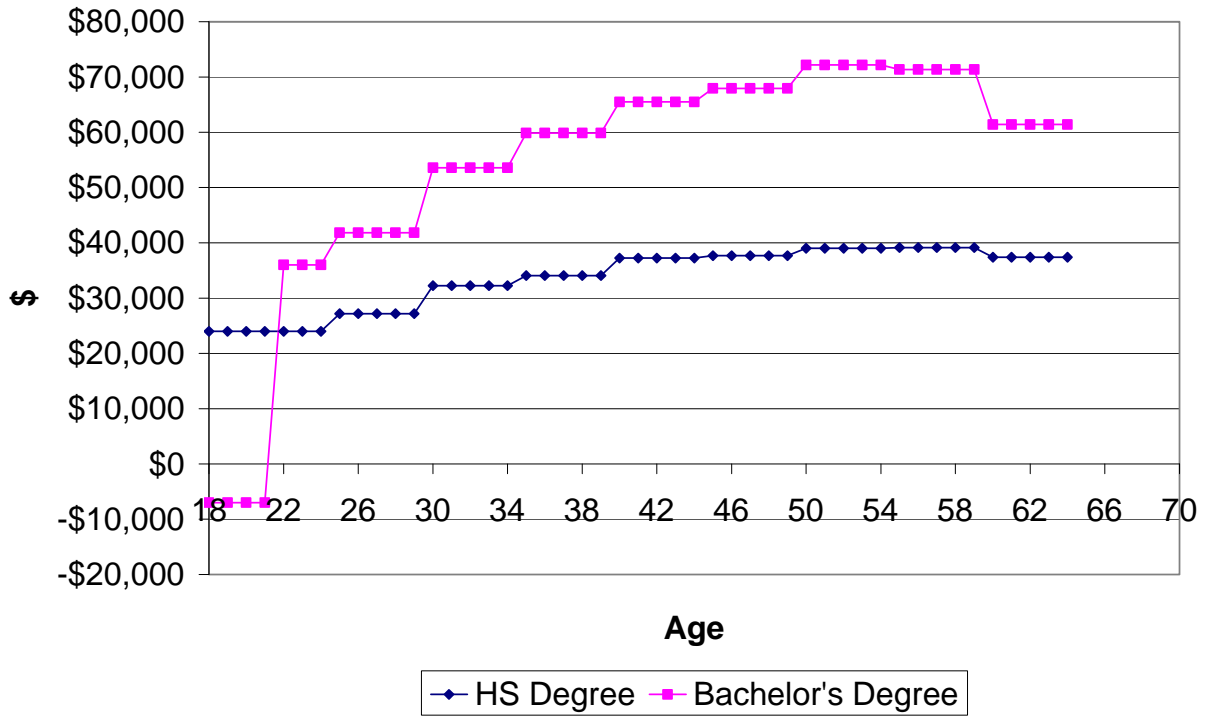
For scenarios 5-8), presume that the same conditions hold for both the high school and college earnings stream so that if they are not working with the college degree, they would not be working with a high school degree at the same age either.

Note: not working is equivalent to zero earnings at that age

Additional Questions

- 1) Using this pattern of returns as a gauge, for whom is the cost of discontinuous labor greater, men or women? Why?
- 2) The results from this scenario may be biased because they are based on wages for different individuals observed at one point in time. There are reasons to believe these artificial life time earnings patterns are more misleading for women than men. Explain why.
- 3) If you had the true pattern of lifecycle earnings for women, would the returns to education be larger or smaller and would the cost of discontinuous labor participation be larger or smaller than the estimates in Table 1. Explain.

Male Bachelor's vs High School



Female Bachelor's vs High School

