

Microeconomics, Module 23, "Allocating Goods over Time" (Chapter 17)

Homework

(The attached PDF file has better formatting.)

This homework assignment deals with interest rates. Landsburg and Barro have the same views on interest rates, so candidates taking both microeconomics and macroeconomics read the same concepts.

Interest rates are discussed in the corporate finance course as well. Interest rates are a major actuarial concern, particularly for interest rate sensitive life insurance products and fixed-income securities. Some actuaries deal with interest rates for recommending investment strategy for their employers.

Financial economists and actuaries deal with nominal interest rates; macro-economists deal with both real and nominal interest rates, and micro-economists focus on real interest rates. The economic theory in both Landsburg's and Barro's textbooks is that *interest rates reflect the marginal utility of consumption in the current period vs future periods*. Economists of the previous generation often related the real interest rate to monetary or fiscal policy; Landsburg and Barro argue with this older perspective.

Consumers have

- current and future income and
- current and future consumption desires.

Consumers may save some of their current income to pay for future consumption or borrow from future income to pay for current consumption.

- If consumers save more, interest rates *decrease*.
- If consumers borrow more, interest rates *increase*.

Question: This seems backwards; won't consumer save less when interest rates decrease and save more when interest rates increase?

Answer: When consumers save more, more funds are available for loans, so interest rates decrease. As interest rates decrease, people borrow more and save less, until the market for saving and lending is back in equilibrium. (Barro says: borrowing always equals lending, since total bonds equal zero.)

The relations above are accepted by all economists. Less clear is why consumers save more or less (or borrow more or less). Landsburg and Barro say that consumers examine their current and expected future income and their current and future consumption desires.

For this homework assignment, we present two ideal scenarios.

Scenario #1: After graduation from high school, students begin jobs as construction workers and elementary school teachers. They expect their wages to remain relatively level throughout their careers. They marry five years after graduation from high school and raise large families with home schooling by the parents. Before marriage, both men and women work; once couples begin home schooling their children, one parent stays home, either the father or the mother.

Scenario #2: After high school, students start pre-medical programs at college. They expect four years of college and four years of medical school, with costs of \$40,000 a year. The students' parents have no extra money, so the students borrow the tuition costs. After medical schools, they work for ten years as surgeons and medical specialists, then have one child that is sent to day care one year after birth and eventually to public school. Both parents work full time.

- A. In each scenario, what is the expected progression of income? For each career, what is the expected ratio of future income to current income (older construction worker vs young construction worker; surgeon vs college student). What is the likelihood of working with home schooled families vs one child in public school or day care?
- B. In each scenario, what is the expected progression of expenses? Consider current education costs and future costs of raising a family. In Scenario #1, why are expenses low before marriage and high after marriage? In Scenario #2, why are expenses high during college and medical school and low afterwards?
- C. In each scenario, do recent high school graduates save for future expenses or borrow from future income? Assume that all the students are good risks and we need not worry about defaults on loans.
- D. In which scenario is the real interest rate higher?

Question: In this scenario, the medical school student is already \$80,000 in debt, but banks still offer loans at reasonably low rates. The construction worker has no debt, but banks demand higher rates on car loans and home mortgages to construction workers.

Answer: The medical school student may be \$80,000 in debt, but if an internist's salary is \$150,000 a year, the medical school student is a good risk. The construction worker's future income remains \$60,000 a year forever, so even a \$20,000 auto loan is risky.

Question: Does this homework assignment imply that interest rates differ for medical school students and construction workers?

Answer: These are ideal scenarios, as if everyone in the economy followed the pattern in Scenario #1 or Scenario #2. The interest rates for loans to medical school students and construction workers depend on their current and future income and the likely effects on default probabilities.

Question: Does this homework assignment imply that it is better to be a construction worker or a physician?

Answer: That depends whether you prefer large home-school families with moderate income or high income life-styles with one child.

This homework assignment does not require mathematics.