

Problem 2

Consider an economy with N identical individuals. Each individual lives for two periods (period 0 and period 1) and is endowed with 1 unit of labor in each period and one unit of a tradable capital good, K . Each individual consumes a single consumption good in each period. All individuals earn wages of W_0 in period 0 and W_1 in period 1. The capital good pays off R in period 1 and can be bought or sold in the market in period 0 but is in fixed supply. Both labor and capital payoffs are denominated in terms of the consumption good in that period. Assume that individuals all have the same preferences and are free to trade the capital good with each other and can also borrow or lend with each other. Assume consumption in each period is a normal good.

- a) Determine the market price of the capital goods and the market rate of interest on loans.
- b) How will the market price of the capital good and the market interest rate vary with W_0 , W_1 and R ? Why? What conditions on preferences do you need in order to sign the effects?
- c) How would technical progress that increases the period 1 wage and the return on capital proportionately affect the equilibrium price of capital and the market rate of interest?
- d) Now assume that individuals can spend time making additional capital goods at a cost of t units of period 0 labor per unit of capital, how would equilibrium prices and investment (the amount of capital goods produced) vary with W_0 , W_1 , R and t ?
- e) How would a tax on capital income (used to finance a lump sum payment to each individual in period 1) affect the equilibrium price of capital and the market interest rate in the fixed endowment case? How would such a tax affect investment, the price of capital goods and the interest rate in the case where individuals can make additional capital goods at a time cost of t ?