

This problem set will be graded out of 10 points.

1. (5 points) The government is concerned about low income households and thus institutes a transfer benefit that ensures that all households, no matter what actions they choose, can consume at least $G = \$14$ per day.

Total time $T = 24$ hours in a day. Time is allocated between work hours, H , and leisure, L .

Households each include only one worker. Workers choose the number of hours to work in a day. The going wage is w . Households consume all earnings plus any transfer benefit B from the government, so that $C = wH + B$. No one saves.

The government transfer benefit to non-working households is $B = G = \$14$.

The government transfer to a household that works H hours “tops up” consumption to $G = \$14$ whenever $wH < G$. Whenever $wH \geq G$, $B = 0$.

(a) Write an expression for the amount of the government transfer benefit. Draw the budget constraint of the consumer in consumption-leisure space. What is the effect of implementing a benefit program where there was none before on the labor hours supplied by a household that consumed less than G before the program? What is the effect on its welfare (better or worse)?

(b) At what H does the household cease to draw benefits? What is the “benefit tax” on \$1 earned for a household drawing benefits from the program?

Suppose the household’s utility of C and L is

$$U(C, L) = \frac{1}{2} \ln C + \ln L$$

(c) Suppose that the household draws a low hourly wage of $w = 2$. Does this household choose to receive benefits from the transfer program? What are the household’s optimal choices of C and L ? What is the effect on the welfare of the household of implementing a $G = \$14$ transfer program where there was none before?

(d) Now consider a higher wage household, with $w = 4$. Does this household choose to receive benefits from the transfer program? What are the household’s optimal choices of

C and L? What is the effect on the welfare of the household of implementing a $G = \$14$ transfer program where there was none before?

Now suppose that the government decreases the “benefit tax” out of the program. Non-workers receive guarantee $G = \$14$ as before. Workers who draw benefits receive $B = G - t w H$, where t is a tax on benefits of \$.25 on the earned dollar. The government *never* makes negative benefit payments to workers, i.e. $B \geq 0$ in all cases.

(e) Write an expression for this new benefit amount. Draw a budget constraint for a worker earning general wage w under the new benefit.

(f) At what H does the household cease to draw benefits? What is the tax on the earned dollar? Comparing these answers to those in part (b), describe the central trade-off in transfer program design.

(g) Another government with no current transfer program has learned about the incentive effects of a transfer benefit involving an income guarantee from watching the first country. Instead it creates an Earned Income Tax Credit program modeled after that in the U.S. Describe the program. Draw the new budget constraint in $C - L$ space. Describe the effects of the implementation of the EITC on the work hours H of workers who did not work before the EITC, workers who worked few hours before the EITC, and workers who worked many hours before the EITC. Do this using indifference curves in your consumption-leisure graph.

2. (1 point) Solve Ch 12 discussion question #8 in your text.

3. (1 point) Capital in the U.S. is supplied according to $S = 10,000r$. Demand for capital by private industry in the U.S. can be expressed as $D^{private} = 1000 - 10,000r$.

(a) What is the private equilibrium interest rate? What level of capital is transacted in the private equilibrium?

(b) Suppose that the U.S. government decides to sell $\bar{K} = 200$ units' worth of government bonds at whatever interest rate the market will bear. Now what is the total (private plus public) demand for capital? What is the new equilibrium interest rate? How much capital is lent in the new equilibrium in total? How much is borrowed by private industry in the new equilibrium? Do we observe “crowd-out”?

4. (1 point) In a perfectly funded pay-go Social Security system, what is the expression for the level of benefits for the aged (B) the system can support? Give an example of three things that may change/can be changed to maintain a constant B when the “dependency ratio” falls.

5. (2 points) True/False/Uncertain and Explain. Define any underlined terms.

(a) In her novel *Sense and Sensibility*, Jane Austen wrote, “If you observe, people always live forever when there is any annuity to be paid to them.” This suggests an awareness of the effects of adverse selection in annuity markets.

(b) The scheme for financing Social Security is unfair, since people with lower earnings are taxed at a higher rate than those with higher earnings.

(c) In-kind transfers are generally worth the cash value of the good. [Employ a graph in your explanation.]

(d) The largest means-tested benefit programs in the U.S. provide in-kind benefits of medical care or insurance and cash benefits.