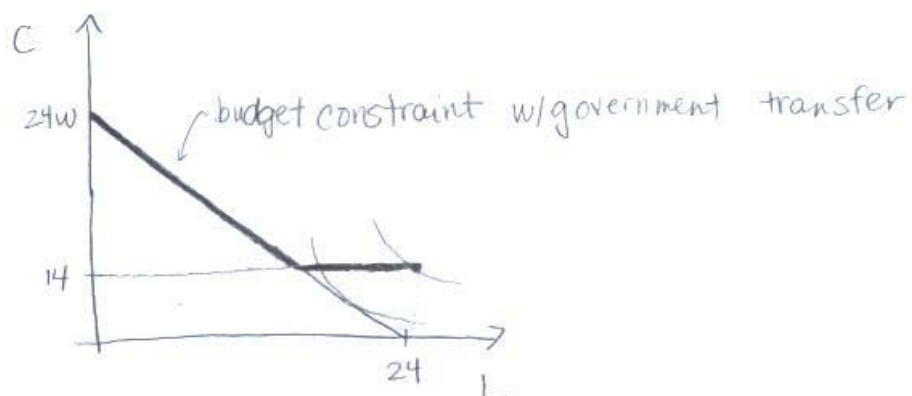


1. a. government transfer benefit =  $\max \{14 - wH, 0\}$



A household that consumes less than \$14 before the transfer benefit is introduced will be better off and will consume  $L = 24$ ,  $C = \$14$ . So their labor hours decreased.

b. A household stops drawing benefits when it earns \$14, so when  $wH = 14$  or  $H = \frac{14}{w}$ . The benefit tax is \$1 because for every dollar the household earns, its benefit is reduced by \$1.

c. If the household doesn't receive benefits, it will maximize utility subject to

$$C = w \underbrace{(24 - L)}_{\text{hours worked}}$$

Plug this into the utility function.

$$U = \frac{1}{2} \ln w(24 - L) + \ln L$$

Take a derivative = set equal to zero:

$$\frac{1}{2} \frac{1}{w(24 - L)} (-w) + \frac{1}{L} = 0$$

$$\frac{1}{2(24-L)} = \frac{1}{L}$$

$$L = 48 - 2L$$

$$3L = 48$$

$$L = 16$$

$$C = 8w$$

Choosing this bundle would give utility of

$$U = \frac{1}{2} \ln(16) + \ln(16) = 4.159$$

If the household chooses to receive the benefits, it will have  $C = 14$ ,  $L = 24$

$$U = \frac{1}{2} \ln(14) + \ln(24) = 4.497$$

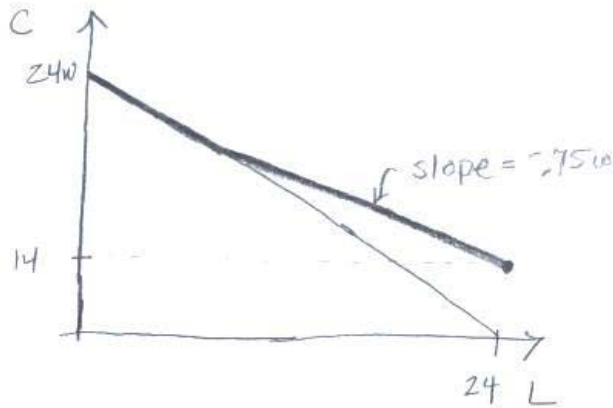
So the household will choose to receive the benefits, and will be better off than if there were no benefit program.

d. If the wage is \$4, now the utility from not getting the transfer is

$$U = \frac{1}{2} \ln(32) + \ln(16) = 4.505$$

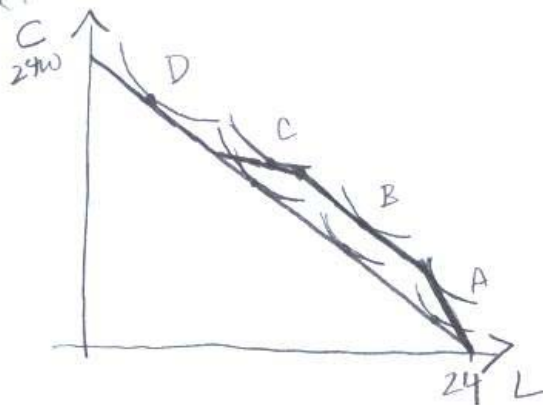
So the household will choose not to get the transfer benefits. The household is equally well off as if there was no transfer benefit program.

e.  $\text{benefit} = \max\{14 - .25wH, 0\}$



f. The household ceases to draw benefits when  $14 - .25wH = 0$ , so  $H = \frac{56}{w}$ .  
 The benefit tax is .25 in this case.  
 The tradeoff here is that because we have a lower benefit tax (less disincentive to work), we have to pay benefits to people making much more money.

g. The EITC has a negative benefit tax at low levels of earnings then it levels off with a zero benefit tax, and then phases out with a range of positive benefit tax.



Person A  $\rightarrow$  it depends on the relative size of income  $\pm$  substitution effects, but generally we think it should increase labor hours.

Person B  $\rightarrow$  there is only an income effect, so labor hours will decrease.

Person C  $\rightarrow$  it depends on IE  $\pm$  SE but in general we would expect labor hours to go down.

Person D  $\rightarrow$  depending on the shape of the indifference curve, labor hours will either stay the same or decrease.

2. Normally with two people and one good, any allocation is Pareto efficient. But since one person has altruistic preferences, the Pareto efficient allocation here will be where the MU of an additional dollar is equal between the two people.

$$MU_s = 50 Y_s^{-1/2}$$

$$MU_m = 50 Y_m^{-1/2} - .8(50 Y_s^{-1/2})$$

$$\frac{50}{\sqrt{Y_s}} = \frac{50}{\sqrt{Y_m}} - .8 \frac{50}{\sqrt{Y_s}}$$

$$\frac{1.8}{\sqrt{Y_s}} = \frac{1}{\sqrt{Y_m}}$$

$$3.24 Y_m = Y_s$$

$$Y_m + Y_s = 200$$

$$3.24 Y_m = 200 - Y_m$$

$$4.24 Y_m = 200 \Rightarrow Y_m = \$47.17, Y_s = \$152.83$$

If both have income of \$100, social welfare is

$$W = 100(100)^{1/2} + 100(100)^{1/2} + .8(100(100))^{1/2} \\ = 2800$$

If Sherry gets \$136 and Marsha gets \$64

$$W = 100(136)^{1/2} + 100(64)^{1/2} + .8(100(136))^{1/2} \\ = 1166 + 800 + .8(1166) \\ = 2898.8$$

So social welfare increases

3. Set supply equal to demand:

$$10000r = 1000 - 10000r$$

$$20000r = 1000$$

$$r = .05$$

$$K = 10,000 \cdot .05 = 50$$

Now the total demand is

$$D = 1000 - 10000r + 200$$

So the new equilibrium will be

$$1200 - 10000r = 10000r$$

$$r = .06$$

$$K = 600$$

The government is demanding 200 of this capital, so private demand is 400. Since private demand has decreased, there is crowd-out

$$4. \quad B = tw \frac{N_w}{N_B}$$

If the ratio falls, the tax can be raised, wages can increase, we could increase  $N_w$  (through immigration, perhaps), we could decrease  $N_B$  (by raising the retirement age, for example).

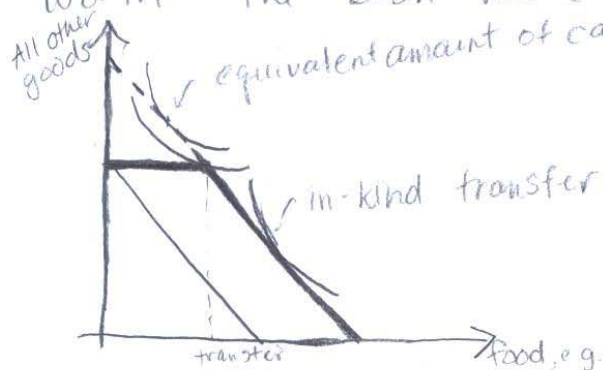
5.a. Uncertain. It could be either moral hazard or adverse selection.

moral hazard - since you have an annuity, you take more care of yourself

adverse selection - you're more likely to buy an annuity if you think you'll live a long time.

b. It's true that lower income people pay a higher tax rate (effectively). But it's not necessarily unfair because higher income people also get a smaller fraction of their income in benefits.

c. In-kind transfers are transfers of goods, not cash. They are not always worth the cash value of the good.



If the household would consume less than the transfer amount, they would prefer the cash.

d. Means-tested programs are programs where you get benefits if your income and/or assets are below a certain level. This statement is true.