Econ 305   Prof. Kasa
Intermediate Macroeconomic Theory   Fall 2015

PROBLEM SET 2
(Solutions)

The first four questions are True, False, or Uncertain. Briefly explain your answers. No credit without explanation. (5 points each).

1. According to Ricardian Equivalence, government budget deficits are irrelevant.

   UNCERTAIN. *It depends on <u>why</u> there is a deficit. If the deficit occurs because there is a deficit-financed increase in government spending, then it would not in general be irrelevant, because changes in government spending have real effects. However, if the deficit occurs because of a deficit-financed (lump-sum) tax cut, then since the present value of households' after-tax income has not changed, their behavior will not change. The deficit would be irrelevant.*

2. Higher interest rates increase saving.

   UNCERTAIN. *It depends on the relative strength of income and substitution effects. The substitution effect would produce an increase in saving. However, if someone is a lender, and the interest rate increases, then a positive income effect on current consumption could offset the negative substitution effect.*

3. According to Friedman's Permanent Income Hypothesis, the marginal propenisty to consume should be smaller for farmers than for government bureaucrats.

   TRUE. *The implicit assumption here is that the income of farmers is more variable, so that the transitory component of their income is greater. Hence, on average, changes in their income produce smaller changes in consumption (e.g., save during good harvests, borrow during bad harvests).*

4. Taxing profits reduces investment.

   FALSE/UNCERTAIN. *A pure profits tax, one that taxes revenues and costs equally, reduces firms' after-tax profits, but it doesn't influence their investment/hiring decisions. Their optimal decision is to still maximize profits. In practice, however, profit taxes tend to tax revenues more highly than costs, due to understatement of economic costs of production. If so, then profit taxes effectively increase the user-cost of capital, and reduce investment.*

5. (30 points). Suppose household preferences are described by the utility function

$$U(C_0, C_1) = \sqrt{C_0} + \sqrt{C_1}$$

where C_0 stands for current consumption and C_1 stands for future consumption. Suppose the household has current income of $Y_0 = 10$ and future income $Y_1 = 220$. Assume the market interest rate is $r = 10\%$.

(a) Write down the households intertemporal budget constraint.

The household's intertemporal budget constraint is

$$C_0 + \frac{C_1}{1+r} = Y_0 + \frac{Y_1}{1+r}$$

(b) Calculate the household's optimal consumption in each period. Is the household a saver or borrower? Explain why.

The intertemporal optimality condition is

$$\frac{U_{c_0}}{U_{c_1}} = \sqrt{\frac{C_1}{C_0}} = 1 + r \qquad \Rightarrow \qquad C_1 = (1+r)^2 C_0$$

Substituting this into the intertemporal budget constraint gives

$$C_0 = \frac{1}{2+r}\left(Y_0 + \frac{Y_1}{1+r}\right) = \frac{1}{2.1}(10 + 220/1.1) = 100$$

Since $C_0 > Y_0$, the household is a borrower. It borrows because its future income is so much higher than its current income.