Problem Set 3
Due at the start of class, Monday, September 27, 2004

1. Short Answer

(a) In the data (I won’t make you get onto FRED to show this!), consumption is less volatile (i.e. it moves around in the short run less) than income. Investment on the hand is more volatile than income. Is this consistent with the permanent income hypothesis? Explain briefly.

(b) It is commonly asserted that individuals’ concern about their consumption relative to others’ tends to raise their consumption as they try to “keep up with the Jones.” In a two-period model with a fixed interest rate and fixed income, can an agent raise his/her consumption in both periods? Explain briefly.

(c) Under Ricardian equivalence the current large budget deficits ought to have no impact on the current account. Explain briefly.

2. Consider the problem of an agent who consumes in two periods, and has preferences expressed by the utility function

$$\ln C_1 + \beta \ln C_2.$$

The agent enters the world with no wealth and earns $Y$ in period 1 and earns income $Y$ in period 2 (i.e. income is the same across the two periods). Assume she can borrow and lend freely at an interest rate $r$.

(a) Write down this person’s maximization problem, including the budget constraint.

(b) Derive the agent’s consumption and saving functions. What is the marginal propensity to consume out of current income?

(c) If $1 + r = \frac{1}{\beta}$, will this agent be a borrower, lender, or neither? Explain briefly.

(d) Suppose instead of having a single interest rate, the agent can save at rate $r_s$ and borrow $r_b$ where $1 + r_s < \frac{1}{\beta} < 1 + r_b$. On a graph, draw the agent’s new budget constraint. Will the agent now be a borrower or lender?
3. In his State of the Union Address on January 28, 1992, President George Bush stated:

And I have, this evening, directed the Secretary of the Treasury to change the Federal tax withholding tables. With this change, millions of Americans from whom the Government withholds more than necessary can now choose to have the Government withhold less from their paychecks. Something tells me a number of taxpayers may take us up on this one. This initiative could return about $25 billion back into our economy over the next 12 months, money people can use to help pay for clothing, college, or to get a new car.

This withholding change was implemented immediately and continued for ten months until the end of 1992. The reduction in tax withholding (i.e. the amount taken out of a person’s paycheck) for a typical married person was $28.80 per month while for the typical single person the reduction in withholding was $14.40 per month. While this change meant that people would not have as much withheld from their paychecks, there was no change in the tax code itself, so the amount due in April 1993 remained unchanged.

Assume the interest rate is zero. What does the *Keynesian consumption function* predict should be the effect of this policy change on consumption and saving? What does the *Ricardian equivalence hypothesis* predict should be the effect of this policy change on consumption and saving?

4. **EXTRA CREDIT: Tax Cuts on Interest Income and Short-Term Stimulus**

Consider a two-period consumption/saving model like the one we have discussed in class. That is, the agent consumes in two periods, and has preferences expressed by the utility function

\[ U(C_1) + \beta U(C_2) \]

with \( U' > 0 \) and \( U'' < 0 \), so we have well behaved, downward sloping, bowed to the origin indifference curves. The agent enters the world with no wealth and earns income \( Y_1 \) in period 1 and \( Y_2 \) in period 2. Let’s introduce a government and suppose the government initially raises revenue only by taxing interest income. Thus the agent’s budget constraint is

\[ C_1 + C_2 + r = Y_1 + (1 - \tau)r \]

where \( \tau \) is the tax rate. The government’s revenue is 0 in period 1 and \( \tau r(Y_1 - C_1^0) \) in period 2, where \( C_1^0 \) is the agent’s choice of \( C_1 \) given this tax rate.

Now suppose the government eliminates the taxation on interest income and instead institutes lump-sum taxes of amount \( T_1 \) and \( T_2 \) in the two periods; thus the agents’s budget constraint is now

\[ C_1 + C_2 + r = (Y_1 - T_1) + \frac{Y_2 - T_2}{1 + r} \]

Assume \( Y_1, Y_2, \) and \( r \) remain fixed.
(a) What condition must the new taxes satisfy so that the change does not affect the present value of government revenues? (That is, we want a revenue neutral tax change).

(b) If the new taxes satisfy the condition in part (a), is the old consumption bundle \((C_0^1, C_0^2)\), not affordable, just affordable, or affordable with room to share?

(c) If the new taxes satisfy the condition in part (a), does first period consumption rise, fall, or stay the same? Does this suggest that tax cuts on interest income is an useful fiscal tool to stimulate short-run consumption in the economy?