Review Problems: IS Curve
Prof. Lutz Hendricks. March 29, 2010

Jones, Macroeconomics, problems 9.1, 10.2-10.6, 10.9, 10.10.

1 IS Curve

1. You should be able to derive the IS curve and determine how it changes when various parameters change.
2. Why is the IS curve downward sloping?
3. What kinds of shocks would shift IS?
4. Why does the long-run IS curve go through the point $\tilde{Y} = 0$ at $R - \bar{r} = 0$?

2 Consumer behavior

1. What does the Permanent Income Hypothesis (PIH) say?
2. What is the intuition underlying the PIH?
3. What complications could invalidate the PIH?
4. You should be able to explain how the household responds to shocks, such as higher expected future income, higher expected taxes.
5. Why is the marginal propensity to consume out of current income small?
6. Suppose you divide a sample of households into two groups: doctors and truck drivers. Doctors have low earnings at the beginning of life, but high earnings later on. Truck drivers are paid the same wage throughout life. Plot the age consumption profiles of both groups. How do they differ?
7. A common approach for stimulating demand in a recession is to send tax refund checks earlier than usual or to add a few hundred dollars to the refunds. Discuss whether this is likely an effective method for stimulating demand.
8. Explain why government spending can crowd out consumption spending.

2.1 Answers

1. For consumption choice, only the present value of lifetime income matters, not when the income is received.
2. Households can borrow and lend. The budget constraint only determines the present value of consumption spending, not when that spending occurs.
3. Borrowing constraints, uncertainty.
4. See slides.
5. A one year increase in income has a small effect on lifetime income. The household spreads the increase over the life-cycle.
6. Different levels (doctors have higher lifetime incomes), but the same slopes.
7. Essentially no effect on lifetime income. Households don't change consumption, unless they are borrowing constrained.
8. Households know that they will eventually pay for government spending through higher taxes. They consume less and save more.

3 Simple PIH Model

Consider an extreme version of the PIH model. Assume that the household wants to hold consumption constant over the life-cycle. She lives for 50 years. She earns \$50,000 per year. There are no complications, such as uncertainty, retirement, taxes. The interest rate is 5%.

You need to compute lots of present values for this question.

1. How much should the household consume in each year?
2. Suppose the household retires after 40 years. How much should she consume each year?
3. Suppose she receives an inheritance of \$300,000 in year 10. How much should she increase consumption in each year?
4. What if the inheritance is received in year 40?

3.1 Answers

1. Easy: \$50,000.

2. Compute the present value of \$50,000 received for 40 years: $W = \$50,000 \times [D^{40} - 1]/[D - 1]$ where $D = 1/1.05$ is the discount factor used to compute present values. Compute the present value of a constant consumption stream for 50 years: $PV(C) = C \times [D^{50} - 1]/[D - 1]$. Solve $PV(C) = W$ for $C = [D^{40} - 1]/[D^{50} - 1]$.

3. The present value of lifetime income rise by the present value of the inheritance: $\$300,000/D^{10}$. The increment to consumption equates the change in W to the change in $PV(C)$: $\$300,000/D^{10} = \Delta C \times [D^{50} - 1]/[D - 1]$.

4. Same, except that the inheritance is discounted by D^{40}.

End of file.