14.02 Principles of Macroeconomics

Problem Set 7

Fall 2017

Question 1 (Chapter 15)

Consider a consumer who lives for three periods: youth, middle age and old age. When young, the consumer earns $\$20,000$ in labor income. Earnings during middle age are uncertain. There is a 50% chance that the consumer will earn $\$40,000$ and a 50% chance the consumer will earn $\$100,000$. When old, the consumer spends savings accumulated during the previous periods. Assume that inflation, expected inflation, and the real interest rate equal zero. Ignore taxes for this problem.

(a)

What is the expected value of earnings in the middle period of life? Given this number, what is the present discounted value of expected lifetime labor earnings? If the consumer wishes to maintain constant expected consumption over her lifetime, how much will she consume in expectation in each period? How much will she save in expectation in each period?

(b)

Now suppose the consumer wishes, above all else, to maintain a minimum consumption level of $\$20,000$ in each period of her life. To do so, she must consider the worst outcome. If earnings during middle age turn out to be $\$40,000$, how much should the consumer spend when she is young to guarantee consumption of at least $\$20,000$ in each period? How does this level of consumption compare to the level you obtained for the young in part (a)?

(c)

Consider the same setting as in (b) above. Given your answer to (b), suppose that the consumer's earnings during middle age turn out to be $\$100,000$. How much will she spend in each remaining period of her life? Will consumption be constant over the consumer's lifetime?

[Hint: when the consumer reaches middle age, she will try to maintain constant consumption for the last two periods of life, as long as she can consume at least $\$20,000$ in each period.]

(d)

What effect does uncertainty about future labor income have on saving (or borrowing) by young consumers in parts (b) and (c)?

Question 2 (Chapter 16)

Using the information available in Chapter 16 and on the corresponding slides, mark each of the following statements as True, False, or Uncertain, and explain why in no more than three lines.

(a)

Changes in the current one-year real interest rate are likely to have a much larger effect on spending than changes in expected future one-year real interest rates.

(b)

The introduction of expectations in the goods market model makes the IS curve flatter, although it is still downward sloping.

(c)

Investment depends on current and expected future interest rates.

(d)

The rational expectations assumption implies that consumers take into account the effects of future fiscal policy on output.[1]

(e)

Expected future fiscal policy affects expected future economic activity but not current economic activity.

(f)

Depending on its effect on expectations, a fiscal contraction may lead to an economic expansion.

[1] In this question, the point is that future fiscal policy matters *if* we assume rational expectations. We are not implying the converse, i.e., that only rational expectations guarantee that future fiscal policy matters.

Question 3 (Chapter 16)

For each of the changes in expectations in parts (a) through (d), determine whether there is a shift in the IS curve, the LM curve, both curves, or neither. In each case, assume that no other exogenous variable is changing.

(a)

A decrease in the expected future real interest rate.

(b)

An increase in the current real policy interest rate.

(c)

An increase in expected future taxes.

(d)

A decrease in expected future income.

Question 4 (Chapter 16)

A new president has been elected, and she promised she would cut taxes. People trust that she will keep her promise, but expect that the tax cuts will be implemented only in the future, i.e, $\Delta T'^{e} < 0$. Determine the impact of the election on current output, the current interest rate, and current private spending under each of the assumptions in parts (a) through (c). In each case, indicate what you think will happen to Y'^{e}, and r'^{e}, and then how these changes in expectations affect output today. In what follows, assume that expectations on future policy rates are independent of current policy by the Central Bank.

(a)

The Central Bank will not change its current real policy interest rate, but will act so as to leave future output unchanged.

(b)

The Central Bank will act to prevent any current or future change in output.

(c)

The Central Bank will not change either the current real policy interest rate, or the future real policy interest rate.