
14.02 Principles of Macroeconomics
Problem Set 4
Spring 2003

Distributed Thursday, April 17
Due Wednesday, April 23 in class

PLEASE FILL IN THE BLANKS BELOW AND ATTACH THIS COVER SHEET TO THE FRONT OF YOUR COMPLETED PROBLEM SET.

NAME: _____

MIT ID NUMBER: _____

TA: _____

CLASS TIME: _____

Question 1: True/False/Uncertain

(based on the material in Chapters 16, 17 and 18 of Blanchard)

Decide whether each of the following statements is True, False or Uncertain (ie. neither always true nor always false). Justify your answer, in a few lines or a simple diagram if appropriate.

- a) The q theory of investment predicts that there should have been a sharp fall in technology investment following the decline in the NASDAQ stock-market index in 2000/2001.
- b) Assuming the money supply stays constant, a cut in government spending will always increase the present value of expected profits, because it causes a reduction in interest rates.
- c) Investment is more volatile than consumption, because it represents a larger share of total GDP.
- d) Thinking about the IS-LM framework, the predicted effect of a short-lived (temporary) change in the money supply will be smaller once expectations are taken into account in the model.
- e) Thinking about the IS-LM framework, the predicted effect of a long-lived (persistent) change in the money supply will be smaller once expectations are taken into account in the model.
- (f) Nominal exchange rates and real exchange rates tend to move in the same direction over short periods of time.
- (g) In practice, the sum of the measured current account balance and measured capital account balance is always exactly equal to zero.

Question 2: Consumption and Expectations

(based on the material in Chapter 16 of Blanchard)

You are 22 and are about to graduate from MIT. You expect to earn \$40 000 per year after graduation, and expect your salary to increase by \$5 000 each year until you retire. You anticipate retiring at the age of 62, and guess that you will live for another 20 years after retirement. Finally, you expect to pay an average tax rate of 30 per cent on your earnings.

- a) Assume that nominal interest rates and inflation are equal to zero. Calculate the net present value of your future earnings.
- b) Imagine you plan to consume a constant amount every year from now on (and end up with no accumulated savings at the end your life). Calculate this expected constant level of consumption.
- c) Draw a graph with your age on the x axis. On this graph, plot your expected income and consumption as a function of your age. During which parts of your life do you expect to save? During which parts of your life do you expect to dissave?
- d) Now assume that, after getting an A on your 14.02 exam, you decide to pursue a career as a high-profile economist on Wall Street. Your expected starting salary is still \$40 000, but you expect this salary to increase at \$20 000 per year (not \$5000 per year as previously assumed). All the other assumptions remain the same. What is your expected consumption per year now?
- e) Compare the amount of saving (or dissaving) you do in the first year after graduation under the assumptions in part (d), compared to the assumptions used in parts (a-c). Given that your salary is \$40 000 in both cases, why is the amount you save/borrow different? Under which scenario do you consume more relative to your income straight after graduation, and why?
- f) Briefly list a few reasons why the assumption that you consume at a constant rate over the rest of your life might be unrealistic.

Question 3: Expectations and Macroeconomic Policy

(based on the material in Chapter 17 of Blanchard)

To answer this question, use the extended IS-LM model developed in Chapter 17 (which takes into account the role of expectations). In each case, draw an IS-LM diagram, and show how the IS and/or LM curves move in response to the event/s described. Under the diagram, give a short explanation in words what happens to output and interest rates and why (or if the movement in output or interest rates is ambiguous, explain why it is ambiguous).

- a) The Fed cuts interest rates (i.e. increases the size of the money supply). People expect the Fed to reverse its actions in the near future though.
- b) Alan Greenspan of the Fed makes a speech in which he states that inflation is out of control. People interpret this speech as a sign that the Fed will raise interest rates in the next few months.
- c) The government announces and begins work on a massive, multi-year public works program (the 'Big Dig'). The planned public works are generally considered by experts and the general population to be a waste of resources.

Question 4: Excellent Adventures in Open-economy Macroeconomics

(based on the material in Chapter 18 of Blanchard)

PART I – EXCHANGE RATES

Tired of oppressive humidity, crass commercialism and endless limbo-dancing competitions in Cancun and Florida, you decide this year to spend Spring Break in New Zealand.

- (a) You leave home with \$500 US, and convert it into \$1000 NZ when you arrive in Auckland, NZ. What is E (the value of one unit of foreign (NZ) currency in terms of domestic (US) currency)?
- (b) After spending a week in New Zealand, you have \$200 NZ left, which you convert at the airport into \$99.80 US. What is the new value of E ? So does this mean the US currency has appreciated or depreciated against the NZ currency during your holiday?
- (c) Assume you expect the trend in the movement of the exchange rate that took place during your week in New Zealand to continue for at least a year (i.e. E continues to move by the same amount each week as it did during your holiday). What is the expected annual percentage change in E ? (In other words, calculate the expected change in E over the year as a percentage of the E you calculated in part (a)). For the purposes of this calculation, use the approximation that there are **50 weeks** in a year.
- (d) Say the inflation rate in the US is 2 per cent, and in New Zealand it is 7 per cent. * Based on the expected rate of change in E you calculated in part (c), what do you expect to be the percentage change in the *real* exchange rate over the next year?
- (e) The one-year US interest rate is 2 per cent. Using your answer for part (c), what would you predict is the one-year interest rate in New Zealand?
[Hint: Use the uncovered interest parity condition.]
- (f) If the US interest rate is 2 per cent, and the interest rate in New Zealand is 10 per cent – which country would you prefer to invest in (taking into account the expected change in E you calculated in part (c))?

* This is not true in practice by the way. Inflation in NZ is actually very low.

PART II – TRADE AND BALANCE OF PAYMENTS

- (g) Based only on the information in the table below, which of the countries listed in the table would you guess has the most “pro-trade” economic policies? Which of the countries would you guess has the least pro-trade economic policies?

	Population (millions)	Exports + Imports (% of GDP)
Country A	96	59
Country B	40	25
Country C	98	25

- (h) Suppose that the US has a large current account deficit. For each of the following (i) – (vi), state whether the event will lead to a larger, a smaller, or no change in the current account deficit:
- (i) People in the United States start buying more domestically-made cars and less foreign-made cars.
 - (ii) The United States increases the amount of aid it gives to foreign countries.
 - (iii) More overseas students start coming to study in the United States.
 - (iv) Americans start to finance a greater share of their current account deficit by selling foreign assets, rather than borrowing from overseas.
 - (v) Foreign investors are paid \$10m in dividends from their holdings of US public companies.
 - (vi) With the conclusion of the war in Iraq, Americans start to travel abroad more often.