Economics 222

Exercise D

Due Nov. 26 by noon

1. The Phillips curve posits a negative relationship between inflation and unemployment. To examine this hypothesis using Canadian data, retrieve the CPI inflation rate π (the core inflation rate as defined by the Bank of Canada) from Cansim II for the years 1979-1984 and 1995-2000. The label for this series is v18702646. You should already have the data for the years 1992-2004:09 from Question 1 on Exercise C. Next retrieve the unemployment rate for Canada (label v2062815) for the same time periods. Convert the series to annual rates by averaging the monthly observations. [It is a good idea to learn how to do this averaging in a spreadsheet program such as Excel or Quattro Pro.] For the remainder of this question, only consider the annual data.

a) Plot a line graph of inflation (on the y-axis) against unemployment (on the x-axis) for the period 1981-1984. Does the graph seem consistent with the existence of a Phillips curve relationship?

b) Plot a line graph of inflation against unemployment for the period 1997-2000. Does the graph seem consistent with the existence of a Phillips curve relationship?

The expectations augmented Phillips curve suggests that the difference between inflation and inflation expectations (*i.e* unanticipated inflation) is negatively related to cyclical unemployment. Imagine that people form their expectations of inflation gradually, such that:

$$\pi_t^e = \frac{\pi_{t-1} + \pi_{t-2}}{2}.$$

That is, people expect inflation to equal the average of the observed rates of inflation for the two preceding years. Furthermore, assume that you are reliably informed by the Government of Canada that the natural rate of unemployment (Nairu) is 6.8 per cent.

c) Plot a line graph of *unanticipated* inflation against *cyclical* unemployment for the period 1981-1984. Does the graph seem consistent with the existence of an expectations augmented Phillips curve?

d) Plot a line graph of *unanticipated* inflation against *cyclical* unemployment for the period 1997-2000. Does the graph seem consistent with the existence of an expectations augmented Phillips curve?

e) In either period, 1981-1984 or 1997-2000, does the expectations augmented Phillips curve suggest a different observed relationship between inflation and unemployment than the Phillips curve?

2. An economist writes: "Canada is a small open economy which, by and large, takes the world real interest rate as given. That is, $r = r_{for}$. One consequence of this is that politicians must be ever vigilant with fiscal policy and that monetary policy must be ready to counter-balance poor fiscal policy choices. In particular, a large increase in government spending must be offset by an increase in money growth rates to prevent inflation." Discuss.

3. Assume that you an economist with the World Bank. You are given the task of providing economic analysis to policy-makers on the economy of Latvia. Previous research on Latvia has determined that Latvia is a small, open, Keynesian economy, where:

$C^d = 250 - 10r + 0.25(Y - T)$
$I^d = 25 - 5r$
$Y = 20N^2$
$N_S = 3 + 0.01w$
$NX = 195 - 0.1Y - 10e$
$L = 0.25Y - 10r$
$M = 1050$
$T = 60$
$G = 50$
$e = 5 + \alpha(r - r_{for})$

What has been left unanswered by previous research has been the size of α which is a parameter that measures the responsiveness of international capital flows. When α is very large then capital flows freely to and from Latvia and as a result, the real interest in Latvia is simply the world real interest rate. When α is very small then capital does not flow freely to and from Latvia and as a result, the real interest rate

in Latvia may not be the same as the world real interest rate. Hence, one can view α as a parameter which measures the degree of 'openness' of the Latvian economy. You have been given the task of determining the importance of α in policy discussions.

a) Suppose $\alpha = 0$. Find the equilibrium values of r, Y, C^d, I^d, P and NX.

b) Next, imagine that α is very large such that $r = r_{for}$. Further, you are told that $r_{for} = 2$. Find the equilibrium values of r, Y, C^d, I^d, P and NX.

c) Now suppose that the government of Latvia decides to raise the stock of money to $M = 1260$. Graphically illustrate the difference of an increase in M for the economy modeled in a) versus that modeled in b).

d) Find the new short-run equilibrium values of r and Y when $\alpha = 0$. Also find the long-run equilibrium price level P.

e) Find the new short-run equilibrium values of r and Y when α is very large. Also find the long-run equilibrium price level P.

f) Suppose you observe that after the increase in the money supply, the actual inflation rate in Latvia was 20 per cent. What do you conclude about the likely value of α? Is there a way to determine the likely value of α from the effects of an increase in M?

4. Imagine that you are an economist with the Department of Finance in Ottawa. Owing to political pressure, Canada and the United States want to have a fixed exchange rate between the Canadian Dollar and the U.S. Dollar (perhaps as the first step to dollarisation). You are given the following information about the Canadian economy:
$C^d = 100 + 0.5Y - r$
$I^d = 50 - 2r$
$NX = 45 - r$
$L = 0.25Y - 0.5r$
$G = 50$
$\pi_{US} = 3\%$
$e_{nom} = 0.8$
$Y = 130$

$M = 100$

a) What is the equilibrium price level, P, in Canada?

b) Suppose that policymakers have determined that the fixed exchange rate should be $e_{nom} = 0.75$. Assuming that purchasing power parity (PPP) always holds true, how much must prices rise or fall in Canada to reach this exchange rate?

c) In order to achieve this rate of inflation or deflation, by how much should the central bank increase or decrease the money supply?

5. While watching the nightly news, you hear an economist say: "the rise in Canada's nominal exchange rate with respect to the United States implies that the real exchange rate must have risen by the same amount." Do you agree with this statement? Discuss.