

UNIVERSITY OF OSLO
DEPARTMENT OF ECONOMICS

Exam: ECON4325 – Monetary policy and business fluctuations, spring 2004

Date of exam: Wednesday, June 2, 2004

Time for exam: 2:30 p.m. – 5:30 p.m.

The problem set covers 3 pages

Resources allowed:

- No resources allowed

The grades given: A-F, with A as the best and E as the weakest passing grade. F is fail.

The exam consists of two parts: A and B. Both parts carry equal weights. You should answer both parts.

Part A consists of four questions, of which you shall answer three. You can choose yourself which question you will leave out. Answer briefly, intuitively and precisely.

Part B consists of one question. Answer in depth and in detail.

PART A

Question 1

Describe a useful strategy for obtaining empirical cycles. Describe some important stylized facts of business cycles that are common in most countries. Emphasize in particular the role of money in the business cycles.

Question 2

Define the concept of driving force and persistence in (a) Lucas's imperfect information model and (b) Real business cycle models. Identify briefly some of the main criticism against the real business cycle models.

Question 3

Distinguish between price inertia and inflation inertia. Briefly discuss the effectiveness of policy in stabilizing the real economy if there is inflation inertia.

Question 4

Characterize and contrast a targeting regime and an instrument rule. Give examples of both.

PART B

Monetary policy

Consider an economy in which supply is given by:

$$y = y_n + a(\pi - E\pi) \quad (1)$$

where y is logarithm of output, y_n is the economy's natural rate of output, π is inflation and $E\pi$ is expected inflation.

The political authorities determine inflation and wish to minimise the following loss function:

$$L = \frac{1}{2}\lambda(y - y_n - k)^2 + \frac{1}{2}\pi^2, \quad (2)$$

where the authorities wish to stabilize both output and inflation, inflation around zero but output around $(y_n + k)$ which exceed the economy's equilibrium output of y_n by the constant k .

- a) *What is the equilibrium rate of inflation under discretion? How does an increase in k affect the equilibrium rate of inflation?*
- b) *Illustrate in a diagram the authorities choice of inflation as a function of expected inflation. What does the figure tell you about the authorities incentive to pursue an expansive policy?*
- c) Assume the economy is hit by aggregate supply shocks, so that (1) is modified to yield:

$$y = y_n + a(\pi - E\pi) + \varepsilon \quad (3)$$

where ε is the mean zero aggregate supply shock. Suppose also that the authorities introduce a policy instrument, and that this information is known to the private sector. The policy instrument follows:

$$\pi = \Delta m + v \quad (4)$$

where Δm is the growth rate of money supply (assumed to be the central bank's policy instrument) and v is a mean zero velocity disturbance, assumed to be uncorrelated with ε . Private sector forms its expectations about inflation before the political authorities determine Δm . Further, we assume that the political authorities can observe ε but not v prior to setting Δm . The authorities use *discretion* and wish to minimize the loss function (1) as before, but taking into account the policy instrument.

With Δm chosen after observing ε but before observing v , what is the first order condition for the optimal choice of Δm (hint: conditional on ε and taking $E\pi$ as given)? Find the corresponding expression for the equilibrium rate of inflation. Interpret your findings.

- d) Suppose instead the authorities can commit themselves to a *policy rule* of the form

$$\Delta m = 0.$$

What will inflation be under this policy rule? Do you think this will be effective in avoiding the average inflation bias? Are there other ways to eliminate the problem of inflation bias?