Written Exam for the B.Sc. in Economics winter 2013–14

Macro B

Final Exam

January 15 2014
(3 hours closed-book exam)

Please note that the language used in your exam paper must correspond to the language of the title for which you registered during exam registration. I.e. if you registered for the English title of the course, you must write your exam paper in English. Likewise, if you registered for the Danish title of the course or if you registered for the English title which was followed by "eksamen på dansk" in brackets, you must write your exam paper in Danish.

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This exam question consists of 6 pages in total including this page.

All questions of both problems should be answered

Problem A

In this problem you are asked to analyze the consequences of market imperfections on long-run employment using the "Right to Manage Model" described in the textbook.

Assume the economy is consisting of n sectors, where the production function for the single firm in sector i is given by

$$Y_i = BL_i^{1-\alpha}, \qquad 0 < \alpha < 1, B > 0 \tag{A.1}$$

and the demand curve for the good produced in the sector is

$$Y_i = \left(\frac{P_i}{P}\right)^{-\sigma} \frac{Y}{n}, \qquad \sigma > 1 \tag{A.2}$$

where Y_i and L_i are real output and employment in sector i, respectively, while P_i denotes the price of sector i output. Y is aggregate output and P denotes the aggregate price level in the economy. Aggregate variables such as P, Y and n are taken as given by the economic agents, that is, by each firm and by each trade union (to be described below).

1. Explain equation (A.1) and (A.2). Explain the role of σ.

Marginal revenue and marginal cost for the firm in sector i can be written as

$$MR_i = P_i\left(1 - \frac{1}{\sigma}\right) \tag{A.3}$$

$$MC_i = \frac{W_i}{(1-\alpha)\, BL_i^{-\alpha}} \tag{A.4}$$

where W_i is the nominal wage level in sector i.

2. Derive and interpret (A.3) and (A.4).

The condition that ensures that the firm is maximizing profits is given by

$$MR_i = MC_i \tag{A.5}$$

3. Show that (A.5) implies that:

$$P_i = m^p \frac{W_i}{(1-\alpha) B L_i^{-\alpha}}, \qquad m^p = \frac{\sigma}{\sigma - 1} > 1 \tag{A.6}$$

Interpret this result. In particular, explain how σ affects the price chosen by the firm. What happens as $\sigma \to \infty$? Explain.

By substituting (A.6) into (A.1) and (A.2) it can be shown that labour demand in sector i is given by

$$L_i = \left(\frac{Y}{nB}\right)^{\varepsilon/\sigma} \left(\frac{B(1-\alpha)}{m^p}\right)^{\varepsilon} \left(\frac{W_i}{P}\right)^{-\varepsilon}, \qquad \varepsilon = \frac{\sigma}{1 + \alpha(\sigma - 1)} > 0 \tag{A.7}$$

You are *not* asked to derive (A.7).

4. It follows from (A.7) that labour demand is isoelastic with respect to the real wage level with an elasticity ε that depends on σ. What is the intuition behind this dependency? Explain why a higher value of σ leads to a higher value of ε.

We now turn attention to the wage setting in the economy according to the so-called Right to Manage Model. We assume that in a given sector i all workers have specific skills that enables them to work in that specific sector only. We also assume that workers within a sector are organized in a monopoly union. The union is perfectly informed so that it knows the labor demand curve (A.7). Taking the general price level P as given, the union of sector i chooses W_i to establish a real wage $w_i = W_i/P$ for its members that maximizes utility given by

$$\Omega = (w_i - b)\left[L(w_i)\right]^{\eta}, \qquad \eta > 0 \tag{A.8}$$

where b denotes the level of real unemployment benefits. It is assumed that $\eta\varepsilon > 1$.

5. Describe briefly and in a non-technical manner the fundamental intuition behind the Right to Manage Model: How does the monopoly union and the firm of sector i interact; how is the wage level and the level of employment determined? Explain why the union is able to determine the real wage w_i in sector i. Interpret (A.8). Show that in order to maximize utility the union sets W_i so that

$$w_i = m^w b, \qquad m^w = \frac{\eta\varepsilon}{\eta\varepsilon - 1} > 1 \tag{A.9}$$

Under the assumption that all n sectors are identical it can be shown that in equilibrium aggregate employment is given by

$$\overline{L} = n\left(\frac{B\left(1-\alpha\right)}{m^p m^w b}\right)^{1/\alpha} \tag{A.10}$$

Note, you are *not* asked to derive (A.10).

Also, assume that the level of unemployment benefit is proportional to the productivity level

$$b = cB, \qquad c > 0 \tag{A.11}$$

6. Explain why it is reasonable to assume that the level of unemployment benefit is proportional to the productivity level. Use (A.11) to recast (A.10) as

$$\overline{L} = n\left(\frac{1-\alpha}{m^p m^w c}\right)^{1/\alpha} \tag{A.12}$$

   Explain how long-run employment is affected by the degree of market imperfections in the markets for products and labor and by the compensation ratio of unemployment benefits. According to this model is there anything the government can do to increase long-run employment?

In the textbook the above mentioned model is extended to allow for expectational errors in order to obtain the expectations-augmented Phillips curve

$$\pi = \pi^e + \alpha\left(\overline{u} - u\right), \qquad \alpha > 0$$

where π is inflation, π^e is expected inflation, u is the unemployment rate and $\overline{u}$ is the long run unemployment rate consistent with (A.12). You are *not* asked to derive the expectation augmented Phillips curve.

7. What possibilities does the expectations-augmented Phillips curve offer in terms of affecting (un)employment in the short run through fiscal and monetary policy? Is it possible to obtain any combination of u and π on a specific Phillips curve associated with a given level of inflation expectations? Discuss briefly the likely outcome of an economic policy that systematically tries to obtain an unemployment rate $u < \overline{u}$? Illustrate. Is it possible to reduce structural/long-run unemployment through expansionary fiscal policy?

Problem B

1. Describe the economic mechanism whereby convergence towards equilibrium takes place in the AS-AD model with static expectations developed in the textbook for the closed economy.

2. Assume that the social loss function of a policy maker takes the form

$$SL = \sigma_y^2 + \kappa\sigma_\pi^2, \quad \kappa > 0$$

   where σ_y^2 is the variance of the output gap and σ_π^2 is the variance of the inflation rate around its target level. Explain why the policy maker is concerned with the variability of output and inflation. Also, comment on the choice of target value for inflation.

3. Explain the so-called "Impossible Trinity" which states that a macroeconomic policy regime simultaneously can include at most two of the following three policy goals:

   a. Free cross-border capital flows

   b. A fixed exchange rate

   c. Independent monetary policy