

Macro-economie II

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Solutions for problems to Chapter 8

Question 1

Part (a)

The validity of this statement depends on the type of union model one uses. In the monopoly union model and in the right-to-manage model the statement is correct. In the first model breaking union power would presumably rob it of its monopoly power (e.g. by allowing other unions to enter or by forbidding unions altogether). In the extreme case, the wage would be driven to its reservation level (B) and employment would be expanded from L^M to L^C in Figure 8.3.

In the right-to-manage model, breaking union power could be interpreted as a decrease in λ , the relative bargaining power of the union in the generalized Nash bargaining model. This would move the solution in the direction of the competitive solution (point C in Figure 8.4) and expand employment.

In the efficient bargaining model, however, the statement is incorrect. In that model, breaking union power can be interpreted as a decrease in the share of output that goes to the workers (“wage moderation”), i.e. a reduction in k in equation (8.22). In terms of Figure 8.5, this shifts the equity locus to the left and reduces both the wage and employment. Jobs are turned into profits (rewards to capital owners).

Part (b)

This statement touches on the idea of corporatism, discussed in Section 8.2 of the book. With weak/small trade unions or with a competitive labour market, there is little unemployment and low wages (see Figure 8.7 in the book). A large/centralized trade union also chooses a high employment-low gross wages solution because it tends to “internalize” the government budget constraint. It knows that high wage claims cause unemployment, high outlays on

unemployment benefits, and thus high labour income taxes and low after-tax wages for the workers.

In the intermediate case, with medium sized unions, the economy is in the worst of both worlds. The unions are large enough to cause damage (demand high wages and cause unemployment) but they are too small to take the government budget constraint into account.

Part (c)

This statement is true under for all trade union models considered. With a high degree of corporatism, the large unions will lower their markup to avoid causing too much unemployment and excessively high labour income taxes.

Question 2

We are free to choose the simplest union model around. This is, of course, the monopoly union model with logarithmic member preferences and a constant elasticity of labour demand. In part (b) of the question we must say something about the market in which the firm sells its product. To do so we must expand the model somewhat. In part (d) we must introduce the employers' tax on labour into the model.

Part (a)

According to equation (8.9) in the book, the monopoly union set the wage according to:

$$\frac{u(w) - u(B)}{wu_w} = \frac{1}{\epsilon_D}. \quad (\text{A1})$$

Assuming that $u(\cdot)$ is logarithmic, we obtain:

$$w = e^{1/\epsilon_D} B. \quad (\text{A2})$$

If ϵ_D is constant, it follows directly from (A2) that an increase in B leads to an increase in the wage. Since labour demand slopes downwards, employment drops off and unemployment increases.

Part (b)

To study the effect of the firm's market power in the goods market we must move beyond the perfectly competitive model of the firm used in Chapter 8 (because there the firm has *zero* market power). Assume that the typical firm j has (a little bit of) market power and faces a downward sloping (inverse) demand curve for its product:

$$P_j = P(Y_j), \quad (\text{A3})$$

with $P'(\cdot) < 0$. The firm's short-run profit, Π_j , is defined by:

$$\Pi_j \equiv P_j F(L_j, \bar{K}) - W L_j, \quad (\text{A4})$$

where $F(\cdot)$ is a constant returns to scale production function, L_j is labour input, and W is the nominal wage. The firm's output is given by $Y_j = F(L_j, \bar{K})$. The firm chooses its price, P_j , and its demand for labour, L_j , such that (A4) is maximized, taking into account that lower output produces a higher product price according to (A3). By inserting $P_j = P(F(L_j, \bar{K}))$ into (A4) we obtain profits in terms of L_j only:

$$\Pi_j \equiv P(F(L_j, \bar{K}))F(L_j, \bar{K}) - W L_j. \quad (\text{A5})$$

Maximizing (A5) with respect to L_j yields the following first-order condition:

$$\frac{d\Pi_j}{dL_j} = P(\cdot)F_L + F(\cdot)P'(\cdot)F_L - W = 0, \quad (\text{A6})$$

where $F_L \equiv \partial F / \partial L_j$ is the marginal product of labour. By rearranging (A6) somewhat, we obtain:

$$\begin{aligned} F_L [P(\cdot) + F(\cdot)P'(\cdot)] &= W && \Leftrightarrow \\ F_L P(\cdot) \left[1 + Y_j \frac{P'(\cdot)}{P(\cdot)} \right] &= W && \Leftrightarrow \\ F_L P_j \left[1 - \frac{1}{\eta_D} \right] &= W && \Leftrightarrow \\ F_L &= \left(\frac{\eta_D}{\eta_D - 1} \right) \frac{W}{P_j}, \end{aligned} \quad (\text{A7})$$

where $\eta_D \equiv -P(\cdot)/(Y_j P'(\cdot)) > 0$ is the absolute value of the price elasticity of firm j 's demand curve.

According to (A7), a firm with some market power equates the marginal product of labour (left-hand side) to a gross markup (term in round brackets on the right-hand side) *times* the real wage rate. This markup, $\eta_D/(\eta_D - 1)$ exceeds unity (because $\eta_D > 1$) and is decreasing in the demand elasticity, η_D . (In the perfectly competitive case, $\eta_D \rightarrow \infty$ and the markup is unity.) Hence, the higher is η_D , the more competitive is the goods market, the lower in the markup, and the higher is the demand for labour at a given real wage rate. We conclude that the demand for labour depends negatively on the markup and thus positively on the demand elasticity, η_D .

$$L^D = L^D(\underset{-}{w}, \underset{+}{\eta_D}, \underset{+}{\bar{K}}) \quad (\text{A8})$$

If we look at the markup expression for the trade union (equation (A2) above) we see that it is not the *level* of labour demand that matters but rather the *elasticity* of the labour demand curve. If this elasticity is constant (as we assume) then nothing happens to the real wage if competitiveness is increased. In terms of Figure 1, labour demand shifts to the right and the union's optimal point shifts from M_0 to M_1 . Employment increases from L_0^M to L_1^M and unemployment decreases.

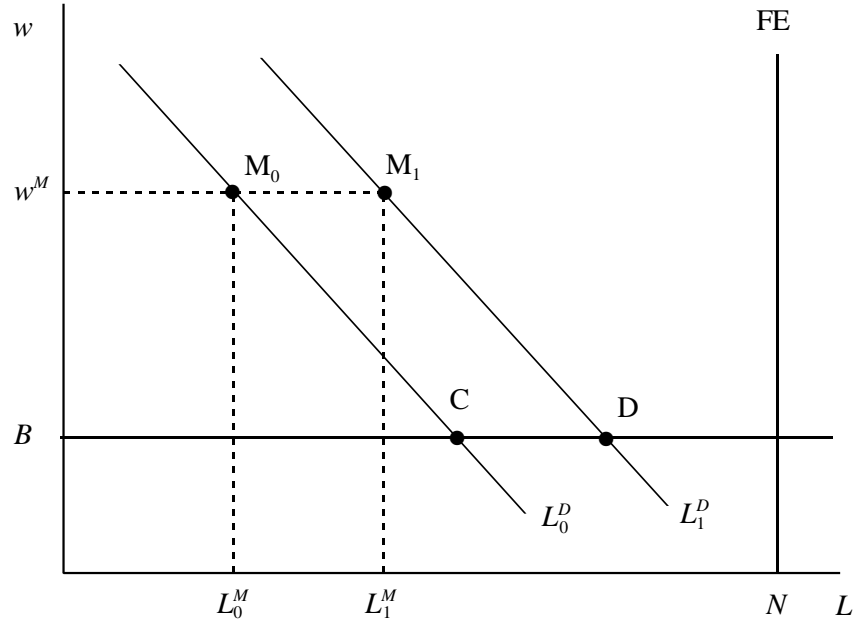


Figure 1: Increased goods market competition and the monopoly union

Part (c)

This issue is explained in detail in Section 8.5.1 of the book. A fall in the degree of progressivity (a rise in s in equation (8.43)) increases both the wage rate and unemployment.

Part (d)

Assume that the representative firm is perfectly competitive. Short-run profit is defined as:

$$\Pi = PF(L, \bar{K}) - W(1 + t_E)L, \quad (\text{A9})$$

where t_E is the payroll tax. Short-run profit maximization yields the marginal productivity condition for labour:

$$F_L(L, \bar{K}) = (1 + t_E) \left(\frac{W}{P} \right). \quad (\text{A10})$$

An increase in t_E shifts labour demand to the left. With a constant elasticity of labour demand, the union does not change the real wage, so employment falls and unemployment increases.

Part (e)

This issue is explained in detail in Section 8.5.1 of the book. An increase in the average tax, t_A , increases both the wage and unemployment—see equation (8.43).

Question 3

This question is explained in detail in Section 8.3 of the book.

Question 4**Part (a)**

See Section 8.1.4. in the book.

Part (b)

Consider Figure 8.6 in the book. If the unions are banished from the primary sector, there will be entry of secondary sector workers into the primary sector until wages are equalized in the two sectors. The economy will go to point C, and (for the case drawn in the figure) unemployment will disappear. This is because w^C is strictly above the unemployment benefit, B .

Part (c)

We again refer to Figure 8.6 in the book. A wage subsidy in the secondary sector will stimulate labour demand in that sector, i.e. $L_2^D(w_2)$ will shift to the left. Unemployment in the secondary sector will decrease as a result.

Question 5

To answer this question one should conduct a survey of the empirical literature on unemployment in Europe. A good (but now somewhat dated) starting point could be the book by Layard, Nickell and Jackman (1991). The empirical literature seems to show that unemployment depends on a lot of factors, not just on the level of unemployment benefits (B). Furthermore, there may be *interrelated effects*. For example, assume that B is untaxed and remains constant. Then a change in the labour income tax will affect the effective unemployment benefit ($B/(1-t)$) and thus influence unemployment.