6. The Labor Market

Problem 6.1.

Consider an economy with many identical households. Each household owns a business that employs both capital (machinery) k and labour l_d to produce output y. (The "d" is for demand.) Production possibilities are represented by $y = Z \cdot k^{0,3} l_d^{0,7}$

The stock of capital that each household owns is fixed. It may employ labour at the prevailing wage w per unit of labour l_d. Each household takes the wage as given. The profit of each household from running its business is:

$$\pi = y - wl_d = Z \cdot k^{0,3} l_d^{0,7} - wl_d$$

a) Determine the optimal amount of labor for each household to hire as a function of its capital endowment k and the prevailing wage w. Call this amount of labor l_d^* ?

b) What is the maximized profit of the household?

c) Each household has preferences over its consumption c and labor supply l_s. These preferences are represented by the utility function $u(c, l_s) = c^{0,5} (1 - l_s)^{0,5}$

Each household has an endowment of labor can be used in the household's own business or rented to others at the wage w. If the household supplies labor l_s, then it will earn labor income $w \cdot l_s$. Output, wages, and profit are all quoted in terms of real goods, so they can be consumed directly. Set up the household's problem for choosing its labor supply l_s.

d) Carry out the maximization from part c) to derive the optimal labor supply l_s

e) Determine the equilibrium wage w^* in this economy.

f) How does the equilibrium wage w^* change with the amount of capital k owned by each household?

Exercise 6.2..

This question concerns an economy with two types of agents: capitalists and workers. There are 1000 capitalists, each of whom owns a farm. A capitalist does not work; he consumes all of his profits immediately. Each farm has the technology:

$$c = 2\sqrt{n}$$

There are 1000 workers. Each worker owns no land, but he is endowed with 1 unit of labor. Workers work for capitalists at a market-determined real wage w. A worker consumes all of his wage income immediately; he has no source of income other than wages. Each worker has preferences over goods consumption c and labor supplied n of the form:

$$u(c, n) = \log c + \log(1 - n)$$

(a) What is the demand for labor in this economy?

(b) What is the supply of labor in this economy?

(c) What is the equilibrium wage rate?

Problem 6.3. (Barro 6.6: The Labor market and efficiency)

In the text we considered two isolated regions, A and B. The technology in A was inferior to that in B. Therefore, we found that opening up, of an economy-wide labor market led to higher aggregate output without requiring an increase in aggregate work effort. In this sense the new market improved the economy's efficiency.

a) Does the result mean that everybody is better off? In answering, consider the position of workers and firms (and the owners of the firms) in both regions.

b) Does your answer suggest that some groups might oppose moves to free up markets, even when there would be gains in the aggregate? Can you think of any real-world examples of this phenomenon?