

Problem Set #2

Econ 366-Markets with Frictions
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Instructions: There are four questions worth a total of 100 points. You are encouraged to work in groups of up to 3 members (you only need 1 submission per group). The problem set is due Monday March 15 by 9AM. Good Luck!

1. (25) **Optimal Hiring Subsidy.** Consider the labor market model of Pissarides (1985). Suppose that the only intervention of the government into the market is to pay a one-time subsidy H to firms whenever they succeed in hiring a worker.

a. Write down the conditions for the market tightness that maximizes welfare. Explain this condition.

b. Write down the equilibrium for the market tightness given the subsidy H and $\beta = 1$. Explain this condition.

c. Find the optimal hiring subsidy H , as a function of the elasticity ϵ of the job-finding probability p wrt θ and of the bargaining power of the worker η .

d. Is the optimal hiring subsidy positive or negative when $\epsilon > 1 - \eta$? And when $\epsilon < 1 - \eta$? Explain your findings.

2. (25) **The determinants of the reservation wage.** Consider the labor market model of Burdett and Mortensen (1998). Suppose that the distribution of wages offered by different firms is given by

$$F(w) = \frac{w - (\mu - \sigma/2)}{\sigma}, \text{ for } w \in \left[\mu - \frac{\sigma}{2}, \mu + \frac{\sigma}{2} \right],$$

where μ is a parameter that determines the average wage offer, and σ is a parameter that determines the dispersion of wage offers. Also, suppose that $\lambda_e = 0$ and $\beta = 1$.

a. Write down and explain the equilibrium condition for the reservation wage R

b. In the same graph, plot the left-hand and the right-hand side of the equilibrium condition for the reservation wage R . Identify the equilibrium value of R .

- c. What is the effect of an increase in μ on R ? Answer the question either graphically or analytically. Interpret your finding.
- d. What is the effect of an increase in σ on R ? Answer the question either graphically or analytically. Interpret your finding.
- e. What is the effect of an increase in b on R ? Answer the question either graphically or analytically. Interpret your finding.

3. (25) Search frictions and the gender gap. Consider the following version of the search model of the labor market by Burdett and Mortensen (1998). There are two labor markets, one for men (m) and one for women (f). On one side of the m labor market, there is a continuum of male workers with measure 1. Each worker has preferences described by the lifetime utility $\sum_{t=0}^{\infty} \beta^t c_t$, where β denotes the worker's discount factor and c_t denotes the worker's consumption in period t , which is equal to b if the worker is unemployed and w if the worker is employed. On the other side of the m labor market, there is a continuum of firms. Each firm maximizes the present value of profits discounted at the factor β . Assume $\beta = 1$. Workers and firms come together through a decentralized process of search. In particular, a worker finds a firm with probability λ_u^m when unemployed and λ_e^m when employed. Assume $\lambda_u^m = \lambda_e^m = \lambda_m$. When a worker meets a firm, it observes the wage of the firm and decides whether to join the firm or not. If he does, he produces y units of output per period until he either finds a better job or he is forced into unemployment (an event which happens with probability δ per period). The labor market f is the same as the labor market m , except that $\lambda_u^f = \lambda_e^f = \lambda_f$ with $\lambda_f < \lambda_m$.

- a. Write down and compare the reservation wage for men, R_m , and for women, R_f . Discuss your findings.
- b. Write down the equilibrium wage offer distributions $F_m(w)$ and $F_f(w)$ in the labor markets m and f . Compute the difference between $F_m(w)$ and $F_f(w)$. What does the sign of the difference tell you about the wages offered to men and women?
- c. Write down the equilibrium wage distributions $G_m(w)$ and $G_f(w)$ in the labor markets m and f . Which is greater: $G_m(w)$ or $G_f(w)$? And what does this say about the wages earned by men and women?
- d. Imagine that a no-discrimination law is introduced by Congress, forcing firms to offer the same wages to women as to men, i.e. $F_f(w) = F_m(w)$. Compute the wage distributions $G_m(w)$ and $G_f(w)$ for men and women. Are they equal? Explain your findings.
- e. Did the no-discrimination policy succeed in reducing gender inequality?

4. (25) Drawing on the material covered in this or other classes, illustrate with an example the following quote by Lars Hansen (University of Chicago, Nobel Prize in Economics).

Recently, I was reminded of the commonly used slogan “evidence-based policy.” Except for pure marketing purposes, I find this terminology to be a misnomer, a misleading portrayal of academic discourse and the advancement of understanding. While we want to embrace evidence, the evidence seldom speaks for itself; typically, it requires a modeling or conceptual framework for interpretation. Put another way, economists—and everyone else—need two things to draw a conclusion: data, and some way of making sense of the data.

That’s where modeling comes in. Modeling is used not only to aid our basic understanding of phenomena, but also to capture how we view any implied trade-offs for social well-being. The latter plays a pivotal role when our aim is to use evidence in policy design.

This is intuitive if you think about the broad range of ideas and recommendations surrounding macroeconomic policy and the spirited, sometimes acrimonious way in which they’re debated. If everything were truly evidence based, to the extent we can agree on the accuracy of the evidence, why would there be such heterogeneity of opinion? The disagreement stems from the fact that people are using different models or conceptual frameworks, each with its own policy implications. Each of them might be guided by evidence, but policy conclusions can rarely be drawn directly from the evidence itself.