Economics 301

Problem Set due November 16, 2018 pricetheory2018@gmail.com

1) Here we consider the gender composition of professions such as law and medicine. The supply of women to a profession depends on the costs of training, such as medical school, and the pecuniary compensation of women practicing in that profession. Assume that, holding constant those variables, each woman is more willing to joining a profession that has a greater fraction of women in it.

   a) Might there be more than one competitive equilibrium in the market for professionals? If so, which one delivers more surplus to women?

   b) How does the equilibrium wage rate depend on whether the professionals are demanded competitively or by a monopsonist?

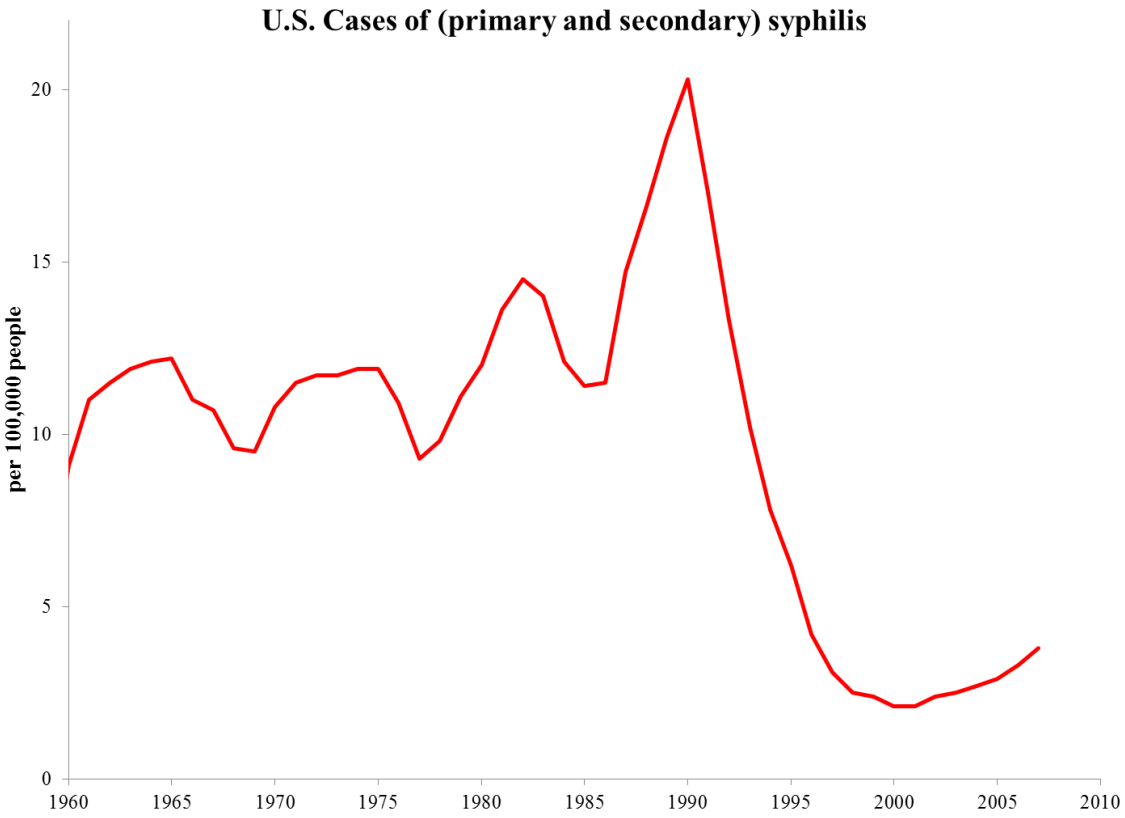
   c) In the competitive case, what is the effect of professional-school tuition on wage rate and gender composition of the professions? Does it matter for an individual's supply whether only she pays more tuition, or all students do? How do these answers depend on the magnitude of the effect of the population average on an individual's supply?

   d) How do your answers depend on the elasticity of demand for professional workers?

   e) Can this model explain why the 1970s dramatically increased the fraction of women in law and medical school from less than one quarter to essentially one half?

   f) Suppose that the predictions that you derived above were confirmed in the data on the professional labor markets. Does that mean that the gender composition of the profession enters a woman's utility function? If not, how else could you explain the findings?

2) Below is a time series chart of the U.S. prevalence of syphilis, which is a sexually-transmitted disease, in its contagious phases.



Because the disease is acquired x years before it becomes contagious we model the dynamics of prevalence y with a difference equation:

$$y_{t+1} = NewInfections_t + (1-r)\,y_t \qquad (1)$$

Where x is the length of the time period, and r is the recovery rate. For simplicity, we ignore births and deaths and assume that the recovered people go back into the susceptible population.

a. What can you say about the relationship between prevalence and new infections? Separate your answer into a mechanical component, related to random pairings of partners, and a behavioral component.

b. Based on your answer to (a), how many prevalence steady states are there?

c. Focusing on the period 1960-85, can incentives explain why prevalence follows a cycle? Take the case where people are ex ante identical (that is, conditional on disease status and their knowledge of market conditions, make the same decisions). Do you need to assume anything about the magnitude of x?

d. How is your answer different if you recognize that people differ in terms of the number of partners that they have?

e. Prostitution was illegal throughout the period shown in the chart. Using your answers from above, what do you predict would have been different about the prevalence series if prostitution had been legal?

f. In about 1990, another sexually transmitted disease was rapidly spreading: AIDS. Does the emergence of AIDS help explain why syphilis prevalence dropped to new lows?