

**Practice Problems B: Labor Markets & Trade**

Revised: October 17, 2014

This will not be collected or graded, but it's a good way to make sure you're up to speed. We recommend you do it before the next class.

1. *Labor market analysis.* As the TF in a Global Economy section, you have been asked to work through an example to illustrate the impact of a minimum wage and payroll taxes on employment and unemployment. You start with these labor demand and supply functions:

$$\begin{aligned}\text{Demand: } L^d(w) &= 1/(1.5w)^3 \\ \text{Supply: } L^s(w) &= w^2.\end{aligned}$$

- (a) Describe first how a frictionless labor market might work. What wage rate clears the market (that is, equates supply and demand)? How much labor is employed? What is the unemployment rate? Sketch the result in a supply/demand diagram.
- (b) Now consider introducing a minimum wage. If the minimum wage is $w_m = 1$, how much labor is employed? How much is supplied? What is the unemployment rate? Show how this works in your diagram.
- (c) Suppose the minimum wage is $w_m = 1/2$. How much labor is employed? Supplied? What is the unemployment rate?
- (d) Suppose there is no minimum wage, but the government imposes 5% payroll tax: a tax on labor paid by the employer. That is: if w is the wage received by the employee, $1.05 \cdot w$ is what the employer pays. What is the equilibrium wage? Employment? How do they compare to the equilibrium without the tax?

Comment. If you aren't comfortable with the mathematics here, you can answer the same questions qualitatively using a supply and demand diagram. You'll get the same insights.

Solution: Same idea as class, with numbers added. See the spreadsheet for calculations (download this pdf file, open it with the Adobe Reader or the equivalent, and click on the pushpin):

- (a) In a frictionless market, prices and quantities adjust until supply equals demand. If we do that, it implies (sorry)

$$w^5 = (1/1.5)^3$$

or $w = 0.784$. If we substitute into supply or demand, we find $L = 0.615$. At these values, everyone works who wants to and unemployment is zero.

- (b) If the minimum wage is $w_{min} = 1$, note that this is above the wage in the frictionless market. At this wage, more people want to work than firms want to hire. We have $L^d = 0.296$, $L^s = 1$, employment = 0.296, unemployment = $1 - 0.296 = 0.704$, and the unemployment rate is $0.704/(0.296 + 0.704) = 70.4\%$.
- (c) If the minimum wage is $1/2$, then we're back to the solution in (a): 0.615 units of labor are employed and unemployment is zero. Why? The market wage is above this minimum, so it's irrelevant.
- (d) The labor demand function becomes

$$L^s(w) = 1/(1.5 \times 1.05w)^3,$$

where w is the pretax wage. Setting supply equal demand gives us a wage of 0.761. Employment is 0.580. There is no unemployment, but both employment and the wage are lower than they were without the tax. Why? Because the cost of hiring has gone up for firms. Even with the lower (pretax) wage, the cost including the tax has gone up to 0.800.

It's probably easier to follow the logic with generic supply and demand curves. The tax shifts the demand curve for labor down by the amount of the tax. If demand slopes down and supply slopes up, we'll see a decline in employment. This isn't any different from other markets. We tax cigarettes, for example, because we want to reduce the quantity. It's the same logic.

2. *Protecting sugar.* The US has a long-running tradition of protecting sugar producers, going back to 1789 when Treasury Secretary Alexander Hamilton helped pass a tariff on sugar imports. (Tariffs at that time were the major source of federal government revenue and were needed to service the country's debt.) Currently the US restricts the quantity of sugar imports (quotas) and guarantees prices to US producers that are well above world prices. More information [here](#) and [here](#).
 - (a) Who benefits from these policies?
 - (b) Who loses?
 - (c) Economists believe that the cost of sugar protection outweigh the benefits, yet these policies have been in place for 200 years. Why?

Solution:

- (a) Producers of sugar or sugar substitutes benefit: Sugar cane and sugar beet farmers, as well as corn growers, who produce the ubiquitous “high-fructose corn syrup,” a common substitute for sugar in American soft drinks and candy. The Iowa primary illustrates this connection in stark terms.
- (b) Anyone who consumes or produces a product that contains sugar is hurt. Also people who use substitutes.
- (c) Sad to say, economists do not make policy. Policy is made by people who wanted to get reelected. Sugar producers are a small group, so you might think their influence would be small, but they have a strong interest in such policies. Everyone else, a much larger group, generally loses from these policies, but their losses, while large in total, are small to them individually, hence unlikely to change their votes.

3. *Dumping coffee.* You are working for Illy USA, the American subsidiary of an Italian company that imports and sells coffee products in the US. Your boss tells you that domestic coffee roasters have filed a dumping complaint against the company, but does not know what that means. He asks:
- (a) What must they show to sustain a judgement of dumping against Illy?
 - (b) What damage could this do to Illy USA?
 - (c) Why has dumping become more common in the recent past?

Solution:

- (a) They must show two things. First, that Illy has priced coffee “unfairly” in the US. For example, that Illy sells coffee in the US below its estimated cost of production or below what it charges in Italy. Second, that they have suffered “injury” as a result.
- (b) It could result in duties (tariffs) imposed on Illy’s imports, not to mention the endless litigation associated with many dumping cases.
- (c) Antidumping cases have risen in popularity as World Trade Organization (WTO) rules have eliminated other trade barriers.

Wikipedia has a nice summary:

[http://en.wikipedia.org/wiki/Dumping-\(pricing_policy\)](http://en.wikipedia.org/wiki/Dumping-(pricing_policy))