Intermediate Microeconomics
Fall 2015

Problem Set 12

Due Lecture 14 in class on paper

1. Gruber Chapter 12, Question 1

A number of web sites, such as www.quickquote.com, offer instant quotes for term life insurance. Use one such website to compare the prices of $1 million 5-year term life policies for 50 year old men and women. Explain the difference in quotes for the man and the woman. Suppose the U.S. government were to pass a law requiring insurers to offer the same prices for men and women. What effect would you expect this this have on prices and insurance coverage?

On average, women live longer than men. This means that women should pay less for life insurance. At any given time, a woman is – on average – less likely to die than a man.

If the government required the same prices in this market, this would be an implicit subsidy for men. In the short run, prices for men would decrease and the quantity of life insurance purchased would increase.

For women, the effect is the opposite. In the short run, prices would increase, and women would purchase less life insurance.

Whether the life insurance market would continue to exist with this pricing depends on how many women are willing to stay in the market and pay the higher premiums. If enough women leave, the new (lower for men) premium will be insufficient to cover costs and the entire market will shut down.

2. Gruber Chapter 12, Question 4

Small companies typically find it more expensive, on a per employee basis, to buy health insurance for their workers, as compared with larger companies. Similarly, it is usually less expensive to obtain health insurance through an employer-provided plan than purchasing it directly from an insurance company – even if your employer requires you to pay the entire premium. Use the ideas from this chapter to explain these observations.

Compare a small company to a large one, with equally healthy (or unhealthy) employees. In the small firm, insurance expenditures will be more variable year to year. Imagine that in a large company, someone will have an expensive case of cancer every year. In the small firm, this expensive case of cancer may come only once every few years. Thus, the small

firms has fewer peole over which to spread risk, and it therefore needs more insuring of losses.

When people participate in employer-provided plans, they are likely to participate regardless of health status. When people purchase insurance on the private market, they are likely to be motivated by a need to be insured – perhaps they suffer some type of chronic illness that makes insurance very valuable. Therefore, employer provided plans suffer substantially less from adverse selection than do direct-purchase plans.

One obvious answer for why small companies pay more for insurance is that the transaction cost of purchasing insurance has a large fixed component. As the firm gets larger, this fixed component is spread across more workers, and the insurance is therefore cheaper. This is likely true, but not one of the issues raised in this chapter.

3. Gruber Chapter 12, Question 12

There are two types of drives on the road today. Speed Racers have a 5% change of causing an accidentt per year, while Low Riders have 1% change of causing an accident per year. there are the same number of Speed Racers and Low Riders. The cost of an accident is $12,000.

(a) Suppose an insurance company knows with certainty each driver's type. What premium would the insurance company charge each type of driver?

(b) Now suppose that there is asymmetric information so that the insurance company does not know with certainty each driver's type. Would insurance be sold if

1. Drivers self-reported their types to the insurance company?
2. No information is know at all about individual driver's types?

If you are unsure about whether insurance would be sold, explain why.

(a) If the insurance company know the types it should charge:
Speed Racers: $(0.05)(12,000) = 600$
Low Riders: $(0.01)(12,000) = 120$

(b, i) Would insurance be sold if drivers self-reported types to their insurance company?

If drivers self-reported types to the insurance company, it is likely that some Speed Racers would say that they are Low Riders. For simplicity, let's assume that they all lie, and that no one is risk averse.

Let N_{LR} be the true number of Low Riders, and N_{SR} be the true number of Speed Racers.

If the insurance company thinks that everyone is a Low Rider, it will collect $(N_{SR} + N_{LR})(120)$. However, it will have to pay out $N_{SR}(12,000)(0.05) + N_{LR}(12,000)(0.01) = 600N_{SR} + 120N_{LR}$.

Recall from the terms of the problem that $N_{SR} = N_{LR} = N$ (for simplicity). Therefore, the insurance company's costs are $720N$, but its revenues are $240N$. Unfortunately for the company, costs > revenues, since $720 > 240$.

The company will go out of business.

What if consumers were risk averse? The company could then charge a premium in excess of the actuarially fair premium. However, Low Riders have to be pretty risk averse to pay a premium (suppose the company charges the average of 120 and 600, or 360) substantially in excess of the actuarially fair premium.

(b, ii) Would insurance be sold if no information was known at all about types?

This is a more severe case of (b,i). Insurance would only be sold if people were sufficiently risk averse, so that the consumer would desire insurance even if the premiums were not actuarially fair.

4. Insurance Regulation

Find an insurance regulation that appears to try to counteract problems of adverse selection. Describe the regulation and your source (briefly!) and explain how this regulation attempts to counteract problems of adverse selection.

You are looking for some type of regulation that requires everyone to participate in the market. Such regulations minimize the problems of adverse selection. State regulations that require drives to have auto insurance with minimum coverage are one such example.