David Youngberg

Econ 304—Bethany College

**Lecture 06: The Market for Lemons**

1. Lemons
	1. Asymmetric information is a big topic in economics, a topic triggered by George Akerlof’s 1970 paper “The Market for "Lemons": Quality Uncertainty and the Market Mechanism”
		1. In 2001, Akerlof won the Nobel Prize for his work in asymmetric information. This paper was one of the seminal papers.
	2. The paper starts with a basic idea: let’s look at the market for used cars. In the used car market, there are good cars (“peaches”) and there are cars which are in poor condition (“lemons”).
	3. While sometimes it’s obvious if a car’s a lemon, it’s not always. Cars are complicated and important deficiencies are hard to the layperson to notice.
		1. Thus we assume that buyers know little about any particular car, but since they can get reports about the car market, they know a lot about the average car.
		2. And we assume that sellers know a lot about both the average car and the particular car they are selling.
2. Intuition
	1. Imagine buyers can only judge cars based on average quality and sellers know exact quality.
	2. Suppose the quality of cars is uniformly distributed, with a max of 2.

2

μ

* + 1. Buyers are willing to pay μ (which is 1 here) since their chances of overpaying equal their chances of underpaying.
		2. But sellers with a quality higher than μ won’t sell which causes the average quality to shrink.

2

μ

1

* + 1. And this process repeats:

2

0.5

μ

2

μ

0.25

2

μ

0.125

* + 1. Eventually the market disappears altogether.
1. The Mathematical Set Up
	1. Assume that the demand for used cars depends on the price of the car (p) and the average quality of used cars (μ). Qd = D(p,μ).
	2. Supply and average quality depend on price: μ = μ(p) and Qs = S(p).
	3. In equilibrium, S(p) = D(p,μ); or S(p) = D(p, μ(p))
	4. Now we assume there are two types of people, each with a different utility function. We also assume no diminishing marginal returns.

$$U\_{1}=M+\sum\_{i=1}^{N}x\_{i}; U\_{2}=M+\frac{3}{2}\sum\_{i=1}^{N}x\_{i}, $$

* + 1. Where *Uj* is the utility of the jth group (1 or 2),
		2. And *M* is the consumption of other goods,
		3. And *N* is the number of cars,
		4. And *xi* is the quality of the ith car.
	1. If there was complete information, people would pay no more than *pi* for a *xi*.
	2. Let group one have *N* cars with quality uniformly distributed from 0 to 2. Group two have no cars.
1. Interpretation
	1. Let the income of group one and group two be Y1 and Y2, respectively. Here we construct some supply and demand curves.

$$μ=^{p}/\_{2}$$

$$S\_{1}=^{pN}/\_{2} , p\leq 2$$

$$D\_{1}=^{Y\_{1}}/\_{p} , ^{μ}/\_{p}>1$$

$$D\_{1}=0 , ^{μ}/\_{p}<1$$

$$S\_{2}=0$$

$$D\_{2}=^{Y\_{2}}/\_{p} , ^{3μ}/\_{2}>p$$

$$D\_{2}=0 , ^{3μ}/\_{2}<p$$

* + 1. First two equations exploit the fact that quality is uniformly distributed. The highest price (quality) divided by two is the average quality.
		2. Note the supply for the first group: if the price is two, they are willing to supply N cars. If the price is one, they are willing to supply half of N.
	1. We now construct total demand curves by adding the two groups together

$$D\left(p,μ\right)= ^{(Y\_{1}+Y\_{2})}/\_{p} , if p< μ$$

$$D\left(p,μ\right)= ^{Y\_{2}}/\_{p} , if μ<p<^{3μ}/\_{2}$$

$$D\left(p,μ\right)= 0 , if p>^{3μ}/\_{2}$$

* + 1. But for any price, *p*, *μ* is p/2. Thus as no price will any trading take place.
1. Applications
	1. *Health Insurance*—as the price of insurance increases the only people who are willing to buy it are those who will use a lot of services. The price rises in response to this increasing cost.[[1]](#footnote-1)
	2. *Employment*—evidence suggests firms are hesitant to hire certain minorities since such minorities tend to be educated at poor quality high schools. Not hiring or promoting them discourages the top applicants which in turn makes the firms even less likely to hire.
	3. *Credit Markets in Developing Countries*—the existence of credit reports makes this less of an issue but in developing countries, such corrections to asymmetric information are weaker. A price is needed and the best drop out, which increases the price.
1. This is why insurance companies exclude people with pre-existing conditions. It’s also why they lobbied for Obamacare—which makes denying people on such grounds illegal—to require everyone to buy insurance. [↑](#footnote-ref-1)