

### XLIII. The Effects of Entry Barriers on Market Equilibrium

- A.** A variety of public policies have the direct or indirect effect of limiting entry into competitive markets.
- For example, regulations may indirectly create barriers to entry by creating cost differentials between existing and new firms by mandating safety, training, environmental, or building code standards on new entrants but not on firms already in the market (grandfathering).
  - Other regulations may directly control regulation as with taxi medallions, land use permits, peanut entitlements, and liquor licensees.
- B.** Such regulations tend to reduce long run supply responses at every price and thereby cause prices and profits to increase in growing markets.
- [illustrate/show dead weight loss]
  - Would such policies affect a Ricardian market?

### XLIV. Regulating Monopoly

- A.** In cases where economies of scale exist over the entire range of production relevant for market demand, a natural monopoly tends to emerge from competitive pressures. Here anti trust regulations would be pointless.
- B.** Regulators often attempt to regulate prices or rates of return that can be earned by such industries so that consumers can benefit from reduced production costs but avoid the worst properties of the standard (non-price discriminating) monopoly problem.
- C.** However, MC cost pricing is not an easy thing to implicate in such markets because the revenues generated tend to be below the total cost of production.

### XLV. The Effects of Taxation on Market Equilibria

- A.** Taxation changes taxed economic transactions from one involving two participants (buyers and sellers) to one's involving three participants (buyers, sellers, and the government).
- B.** Excise taxation thus change the conditions for equilibrium in a competitive market from  $Q_d(P^*) = Q_s(P^*)$  to  $Q_d(P^*+T) = Q_s(P^*)$ .
- That is to say, there is a "tax wedge" between the price paid by consumers and the amount received by firms.
  - The burden of a tax is not revealed by the new equilibrium condition insofar as buyers and sellers in many cases would each bear part of the tax burden.
  - [Figures of different tax burdens, note under constant returns production, the tax burden is eventually all shifted to consumers.]
  - The tax burden is not a matter of "who pays the check" but rather changes in the net benefits from trade that are borne by buyers and suppliers.
  - Note also that the marginal deadweight loss of a tax is generally much higher than the average deadweight cost of the tax.
  - [Show the effect of an income tax on an individual's decision to work or not? Does income taxation reduce work effort? Show mathematically how a lump sum tax avoids this effect.]

### XLVI. Pigovian Taxation and Externalities

- A.** In cases where an externality is generated by an activity, it will often be the case that the activity level will be set at levels that are not Pareto efficient.
- B.** The easiest way to demonstrate this mathematically is with a two person (group) illustration.
- Suppose that Al and Bob are neighbors. Both own barbecues, and that neither enjoys the smell of smoke and such associated with the other use of their barbecue. Let us refer to Al as Mr. 1 and Bob as Mr. 2.
  - Let  $U_i = u_i(C_i, B_i, B_j)$  for each person  $i$  (here:  $i = 1, 2$ ) with  $C_i$  being food cooked indoors and  $B_i$  being food cooked outdoors by  $i$ , and  $B_j$  being food cooked outdoors by the neighbor ( $i \neq j$ ). To make the model tractable, assume that Mr.  $i$  allocates his "kitchen time"  $T_i$  between cooking and barbecuing so that  $T_i = C_i + B_i$  for all  $i$ .
  - Mr.  $i$ 's barbecuing time can be determined by maximizing  $U$  subject to the time constraint. Substituting the constraint into the objective function to eliminate  $C_i$  yields:  $U_i = u_i(T_i - B_i, B_i, B_j)$ .
  - Differentiating with  $B_i$  yields:  $U_{iC_i}(-1) + U_{iB_i} = 0$ . Each person will use the barbecue up to the point where the marginal cost in terms of reduced satisfaction from indoor cooking equals the marginal utility of further outdoor cooking.
  - The implicit function theorem implies that  $B_1^* = b_1(B_2, T_1)$ . This can be interpreted as Mr.  $i$ 's best reply function.
  - In a Nash game between the two neighbors, equilibrium will occur when:  
 $B_1^{**} = b_1(B_2^{**}, T_1)$  and  $B_2^{**} = b_2(B_1^{**}, T_2)$
  - The matter of whether this is Pareto Efficient or not is intuitively obvious. The question is whether or not Al or Bob could be made better off by coordinating their behavior or not.
  - One way to determine this is to show that a general social welfare function is maximized at by the relevant choices: e. g. whether the first order conditions are the same or not.
  - Another method of determining this without using a social welfare function (taken from Baumol) is to consider whether one person could be made better off at the Nash equilibrium without making the other worse off.
    - For example: maximize  $L = u_1(T_1 - B_1^*, B_1^*, B_2^*) - \lambda (U_2 - u_2(T_2 - B_2^*, B_2^*, B_2^*))$  by varying  $B_1$  and  $B_2$
    - Differentiating with respect to  $B_1$  and  $B_2$ , and appealing to the envelop theorem (to eliminate effects of  $B_1^*$  on  $B_2^*$  and vice versa) yields:  

$$U_{1C_1}(-1) + U_{1B_1} - \lambda U_{2B_1} = 0$$
 and 
$$U_{1B_2} - \lambda (U_{2C_2}(1) + U_{2B_2}) = 0$$
    - Note that these first order conditions are different than those met for either person insofar as they imply that the externality will be internalized at the margin for both parties.

### XLVII. Discussion: Some Limitations of Equilibrium Analysis

- A.** In spite of the huge number of generalizations of the neoclassical competitive model, there remain a number of problems.
- B.** No actor in the GE model controls prices, so it is not clear how prices adjust.

- C. Even if persons can adjust prices, it is not clear that they will reach the Walrasian Equilibrium. For example Arrow and Horowitz demonstrated that Tantonment processes do not necessarily converge to the Walrasian price vector unless all good are gross substitutes.
- D. The model can handle some varieties of entrepreneurship, but not all, nor does a the continual wave of innovation that seems to characterize ongoing market activity seem to be a natural outcome of the basic model. [Kirzner rationalizes this dynamism as the process via which we reach LR equilibrium. Schumpeter argues that this is a process by which equilibria are destroyed by innovation.]
- E. As we discussed earlier, it is by no means obvious what a homogeneous commodity is in a world with positive information and transport cost?
- F. The representation of people is also static. If people are constantly changing do we have to abandon equilibrium?

### XLVIII. Stigler's Demand for Information Model

- A. Although the core models of price determine rely upon perfect information for several of its conclusions--especially about zero profits and single prices--one can use the neoclassical hardware to model the demand for specific kinds of information: say price and quality information.
- B. For example, consider Stigler's (1961, JPE) model of price information. To simplify just a bit suppose that you can spend time looking to purchase a good or can spend time earning income to purchase the good in question.
  - i. Sampling theory tells us that the minimum price will fall as the size of the sample increases, thus the expected price falls as the time spent searching falls.
  - ii. Let  $U = U(X)$ ,  $P_X \sim f(S, \mu_p, \sigma_p)$ ,  $T = S + L$ , and  $P_X X = wL$ .
  - iii. Thus  $U^e = \int u((T-S)w/P_X) f(S, \mu_p, \sigma_p) dP_X$
  - iv. Differentiating with respect to  $S$  yields:
 
$$\int [u_X(-w/P_X) f(S, \mu_p, \sigma_p) + U f_S] dP_X = 0$$
  - v. Which implies that  $S^* = s(w, T, \mu_p, \sigma_p)$   $S^*$  is the optimal quantity of searching to invest in, or the optimal amount of time to invest gathering and processing information.
  - vi. The implicit function rule can be used to sign partial derivatives of  $s$ . [This is left as an exercise.]
  - vii. In equilibrium, the variance of the distribution of prices  $\sigma_p$  will reflect the efforts at searching out the least price of all shoppers.
- C. The search model has some implications about prices:
  - i. First, rather than a single price, each market will be characterized by a price distribution.
  - ii. Second that the variance of that distribution may be associated with characteristics of the goods themselves (commonplace repeat purchases) and the magnitude of the average price of the goods purchased, and the opportunity cost of time spent searching (the wage rate).

### XLIX. The Coase Theorem

- A. The extent to which regulations and other government regulations are necessary--or indeed can have any effect--is challenged by what has come to be called the Coase Theorem, a noteworthy extension of the core neoclassical model of exchange that helped its inventor win the Nobel Prize is what has come to be called the Coase Theorem.
- B. The basic idea of the Coase theorem is that all market inefficiencies can be described as situations where there are unrealized potential gains to exchange.
  - i. If contracts can be consummated, these gains can be realized. Thus as long as transactions costs are "low" all market inefficiencies can be solved via appropriate contracts between the affected parties.
  - ii. Moreover if there is a unique efficient outcome, then the initial distribution of property rights (as long as these are clear and tradable or binding contracts exist) does not affect the final result except for effects on the distribution of wealth because of changes in the direction of "side payments." [Geometric illustration.]
- C. More generally, Coase argued that in cases where transactions costs are significant, it is a good idea to allocate property rights in a manner that moves one to the Pareto efficient outcome. That is to say, in settings where property rights might be important, one should arrange them so that market participants find themselves nearly at the Pareto efficient state of the world. (How you do this is not always so clear.)
- D. [Discussion: what does zero transactions costs mean? What about information and hold out problems, and externalities among bargainers? What about the government's power of eminent domain? Can one contract over the property rights themselves?]
- L. **Bargaining and the Coase Theorem: Is the World Necessarily Pareto Efficient?**
  - A. The *Coase Theorem*, as it has come to be understood, states that in a setting without transactions costs, where property rights are well-defined, and where wealth effects are unimportant, private bargaining will always generate a Pareto efficient outcome. *Moreover in cases where there is a unique Pareto optimal outcome, the same final outcome emerges regardless of the initial distribution of property rights.* (That is to say, the different distributions of property rights affect the distribution of wealth but not the efficiency of the final outcome in settings where transactions costs are unimportant and there is a unique Pareto optimal outcome.)
    - i. Coase goes on to argue that the distribution of property rights that "should" be preferred in practice are those which tend to generate outcomes like those which would have occurred in the absence of transactions costs.
    - ii. Voluntary solutions to externality problems are all loosely called *Coasian contracts*. Probably the most ambitious Coasian Contracts are international environmental treaties.
    - iii. [Note that wealth effects and transactions costs can greatly affect the narrow Coasian conclusions. For example, initial endowments and bargaining skills can both affect the post-trade equilibrium in the Edgeworth box. E.g. in that setting wealth effects matter.]