Lecture Note 9: Applied Competitive Analysis: A Second Example

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1 The market for real estate brokers

- The price system solves an informational problem: determining how much of a good should be produced and how much should be consumed. Production should occur until the marginal willingness to pay is equated with the marginal cost of production. When prices rise, more should be produced and/or less consumed. When prices fall, more should be consumed and/or less produced. Prices provide signals to consumers and producers about how to adjust production and consumption. These signals continually push the market back towards equilibrium.

- What happens to supply and demand when prices are not set by market forces? The Hsieh and Moretti paper, in the *Journal of Political Economy*, 2003, provides a great example.

- The market for real estate brokers appears to be cartelized by the real estate brokerage industry. Brokerage commissions are largely (not entirely) fixed across time and space at six percent of the selling price of the property, regardless of the price of the property, the state of the market (active, slow), the experience of the broker (old, young), the number of competing brokers available (a glut, a shortage), the brokerage services the seller desires, etc.

- It is hard to explain this fixity by any mechanism other than collusion. Collusion appears coordinated and enforced, as Hsieh and Moretti discuss, by use of a national sales database (MLS) that publishes the brokerage commissions charged on every sale. Brokers may

enforce the cartel by penalizing one another for price discounting and by shunning sellers who attempt to sell their homes without a broker (even though self-sellers often advertise their willingness to pay the 'selling broker's' 3% of the deal).

- This fixed commission structure creates a strange market pricing scheme for real estate sales. The 'price' (commission) for a sale is higher on more expensive properties, even though these properties may not take more work to sell. Moreover, when real estate appreciates, realtors' fees rise. Thus, rises in housing prices generate an automatic increase in the transaction price.

- Is this efficient? It seems unlikely. When housing prices appreciates, this does not necessarily make it harder for brokers to sell—in fact, it may be easier since rising prices signal a 'hot market.' If so, rising commissions may 'over-compensate' brokers relative to their opportunity costs. In economic jargon, brokers may earn '**rents.**' A rent is a price that an economic agent is paid that exceeds his or her opportunity cost. (It can also be a price paid to a factor in excess of its opportunity cost, e.g., when a movie theatre charges \$5 for a bucket of popcorn, it is earning rents on that sale since there is no plausible resource cost or scarcity that could drive the opportunity cost of that bucket of popcorn to \$5).

- A well-known problem with rents is that they create incentives for 'rent-seeking.' If someone is handing out free money, people will expend real resources to get some of it. For example, they may stand in line. And if there is a lot of free money to be had, the line will be very long—so much so that the last person in line may be just indifferent between getting the free money and going home.

- It is possible for no one to earn rents in equilibrium because the rents are entirely dissipated by rent-seeking. If so, this is worse than a simple case where rents are earned: substantial resources are consumed to reach an equilibrium where no one gains from rents. (Can it be worse than that? Yes. There is no reason why the sum of resources expended on rent-seeking is bounded by the amount of rents available. If a thousand people each waste a dollar seeking \$100 in rents, then \$900 is lost on rent-seeking.)

1.1 Rent seeking in the residential real estate market: A stylized model

Consider the following simple conceptual model:

1. There is a supply of houses on the market that depends on the *transaction price* P_R of real estate brokerage services. Denote $H(P_R)$ as the number of houses for sale at price P_R, with $H'(P_R) < 0$. [Note: P_R is the price of the broker's commission, not the price of the house.]

2. There is a supply of real estate agents, $R(P_R)$, willing to provide services at price P_R, with $R'(P_R) > 0$.

3. In free market equilibrium, P_R^* solves $H(P_R^*) = R(P_R^*)$: the supply of brokers is equated with the demand from sellers to sell their houses.

4. Now simplify further: Assume that H does not depend on P_R. Rather, the number of houses for sale fluctuates for a variety of reasons, and broker commissions are too small to affect the number of houses on the market. In this case, the model would become

$$R(P_R^*) = H.$$

   When the number of houses for sale increases, the transaction price P_R rises to bring more brokers into the market.

- Note that in this simple example, there is one broker per home sold. You can think of this model as more generally representing an equilibrium where there are enough active brokers in the market to sell the number of homes that come on the market. So, when a seller puts a home on the market, she is able to find a broker but she is not mobbed by 100 brokers wanting to sell her home.

1.1.1 Equilibrium with a fixed commission structure

Now consider the real estate market as it works in the U.S. Assume that the average price of houses is exogenously set at P_H. This price fluctuates substantially over time for reasons that have little or nothing to do with the supply of real estate broker prices (e.g., people suddenly want to move to Silicon Valley, thereby raising prices, and want to leave Detroit, thereby lowering prices).

- The real estate commission price is set as follows

$$P_R = 0.06 \times P_H$$

- Define the following quantities:

  1. The sum of sales commissions is the number of houses times the transaction price. Notice that this is also the sum of wages paid to brokers.

$$C = 0.06 \times P_H \times H\left(P_H\right)$$

  2. Average wages of real estate brokers, w, are equal to total commissions divided by total broker supply, which is itself a function of average wages:

$$w = \frac{C}{R\left(w\right)}$$

  3. Let's assume that $H\left(P_H\right) = H$ does not depend on P_H. House prices will rise when there are more buyers in the market than sellers and they will fall when there are more sellers in the market than buyers. A rise in price could be consistent with an increase or decrease in the number of houses for sale.

- What is the equilibrium wage, w^*, in this model? Total commissions, equal to $0.06 \times P_H \times H = C$, are fixed (set by the number of houses on the market, their price, and the fixed commission).

- Hence, the only thing that determines what the average brokers earn is the number of other broker in the market. As more brokers enter, w falls because C is now divided among a larger number of brokers. The fall in w dampens the incentive for additional brokers to enter the market. When w reaches a level at which no brokers want to enter or exit, we are at w^*. Specifically

$$w^* = \frac{C}{R\left(w^*\right)}$$

- How does an increase in the house price affect wages? Notice that

$$w = \frac{C}{R\left(w\right)} = \frac{0.06 \times P_H \times H}{R\left(w\right)}$$

Taking logarithms:

$$\begin{aligned}
\ln(w) &= \ln(C) - \ln[R(w)] \\
&= \ln(0.06 \times P_H \times H) - \ln[R(w)] \\
&= \ln(P_H) + \ln(0.06 \times H) - \ln[R(w)] \\
&\frac{\partial \ln w}{\partial \ln P_H} = 1 - \frac{\partial \ln R(w)}{\partial \ln P_H}
\end{aligned}$$

- In words, broker wages will rise less than one for one with house prices if broker supply responds to the wage. In the extreme case, if $\partial \ln R(w) / \partial \ln P_H = 1$ (that is, the elasticity of broker supply with respect to the price of houses is equal to 1), broker wages will be invariant to house prices. In that case, the entire increase in commissions accompanying a rise in house prices will be absorbed by the entry of additional brokers. The average broker's earnings will be unaffected by the rise in house prices.

- This scenario is what economists term a *dissipative* externality. The rents generated by the fixed commission structure are dissipated (offset) by rent-seeking by entrant brokers. Here's the argument:

    1. Earnings of incumbent brokers are reduced in exact proportion to the number of new brokers entering. That is, since C is set by house prices and the number of houses on the market but does not depend on the number of brokers, total broker earnings are fixed at $0.06 \times P_H \times H$. No matter how many brokers enter, total broker earnings are unchanged. Broker entry simply *transfers* income from incumbents to entrants.

    2. Home-owners also do not benefit from more brokers entering the market. In a competitive model, new entry would lower the transaction price, thereby increasing homeowner surplus. But since the price is fixed, this cannot occur. [It is, however, possible that homeowners benefit in other ways from additional brokers seeking their business. Business-hungry brokers might offer to walk their clients' dogs in the morning, pick their kids up at school in the afternoon, cook hot meals at dinner, and provide hours of delightful company all day long.]

    3. Finally, society loses due to the entry of these new brokers into the real estate sector. Why? These brokers are foregoing other productive activities to enter this sector;

they are giving up jobs that they would otherwise have held, or they are foregoing leisure that they otherwise would have enjoyed. Why is foregoing leisure wasteful? Because the entry of these brokers creates no net benefits; it simply transfers income from incumbents to entrants. Thus, their leisure is lost but nothing in net is gained.

- Question: Are the deadweight losses larger or small when the broker elasticity of supply is higher (i.e., $\partial \ln R(w) / \partial \ln P_H$ larger)?
- Question: Why would it be nonsensical in this model for $\partial \ln R(w) / \partial \ln P_H$ to be greater than 1?

1.2 Putting this hypothesis to the test

- This simple conceptual framework is surprisingly straightforward to test. It has three main empirical implications for what should occur as house prices rise:
  1. The number of real estate brokers increases
  2. Productivity per broker falls
  3. Wages of brokers rise by much less than the price of houses
- The figures from Hsieh-Moretti make the case very clearly.
- Are there any reasons to think that the entry of new brokers in response to rising housing rise is *not* a pure social waste?
- How could this market structure be altered to produce a more socially efficient outcome?
- Assume that you were constrained to keep the current fixed commission structure in place. Is there any regulatory action that could be taken to make the market operate more efficiently given this constraint?
- [Hint: In a market with a non-correctable distortion, such as the current real estate commission structure, it may sometimes increase efficiency to implement a second, compensating distortion. This idea is referred to as 'The General Theory of the Second Best.']

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