Lecture Note 9 — Applied Competitive Analysis: A Second Example

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1 The market for real estate brokers

- The price system solves a resource allocation problem: determining how much of a good or service 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 drive production and consumption decisions that (in theory) increase surplus.

- 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 6.0 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, an increase in housing prices generate an automatic increase in the price that brokers' receive.

- 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 signal a "hot market" where brokers actually add *less* value. If so, rising commissions may compensate brokers far more than their opportunity cost.

- 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 theater charges \$7.50 for a bucket of popcorn, it is earning rents on that sale: there is no plausible resource cost or scarcity that could drive the opportunity cost of that bucket of popcorn to \$7.50).

- Rents are distinct from standard consumer or producer surplus in that they occur *at the margin*. That is, in a standard market setting, consumers and producers both earn surplus on infra-marginal transactions but they are indifferent about the last unit transacted. If rents are present, however, either consumers or producers or both earn strictly positive surplus on the marginal transaction. This is *not* what we usually expect to occur in market equilibrium. Usually when rents accrue at the margin, this indicates that there is a distortion in the market that prevents a competitive equilibrium from eliminating these rents.

- 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 will generally be just indifferent between getting the free money and going home. Unlike much economic activity, standing in line to receive free money doesn't create a lot of economic value or improve the human condition. So even if *someone* gains from rent-seeking, it would be better if we rewarded people for opening businesses that increase total surplus than rewarding people for standing in line.

- Even worse, it is possible for no one to even gets rents in equilibrium because the rents are entirely dissipated by rent-seeking behavior. If so, these rents are pure social waste: substantial real resources are consumed to reach an equilibrium where no one gains from rents. 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 expend a dollar seeking \$999 in rents, then $\$1,000$ is spent on rent-seeking, which is more than the rents originally available.

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

Now let's consider rent-seeking in the residential real estate market.

Setup

- Total commissions available to realtors are

$$TC = P_H \times Q_H \times 0.06,$$

  where P_H is the price of housing, Q_H is the quantity of housing on the market, and 0.06 is the commission rate.

- The wage of realtors is

$$w = \frac{TC}{Q_R},$$

  where Q_R is the quantity of realtors active in the market. That is, the wage that realtors receive is simply total commissions divided by total realtors. In reality, some realtor will get more, some less (those who don't sell houses in the case of excess realtor supply will get no commissions). It's useful to think of w here as representing the *expected* wage that realtors anticipate receiving when they enter the market.

- The supply of realtors depends positively on the wage

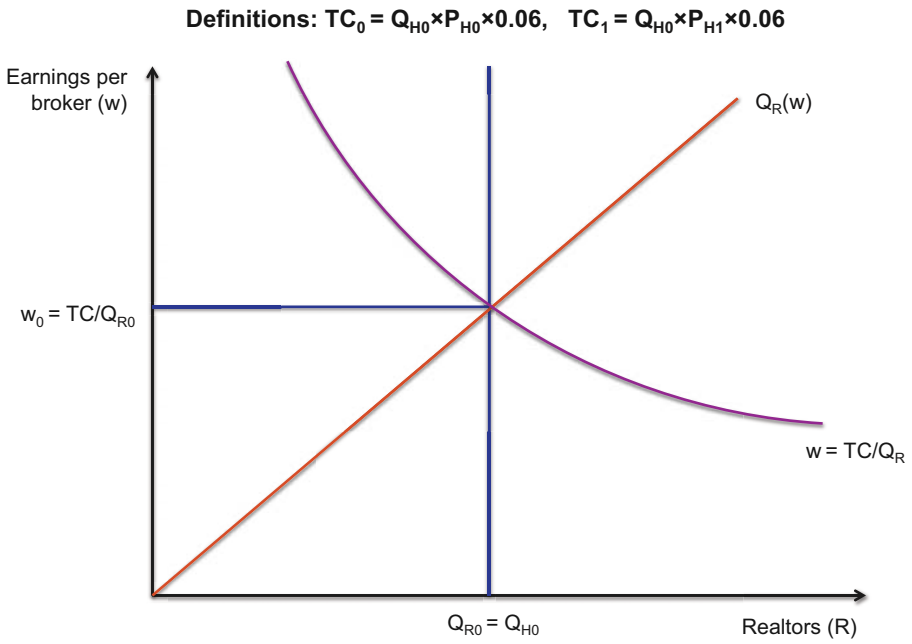
$$Q_R = Q_R(w), \text{ with } Q_R'(w) > 0.$$

- To keep this stylized model simple, we assume that exactly one realtor is needed to sell a house. Having more realtors on the market than houses creates no additional

benefits for home-sellers. If there are fewer realtors on the market than home-sellers, this harms home-sellers (presumably, the housing market will not clear).

Initial environment

Figure 1



- Let initial prices and quantities be as follows:

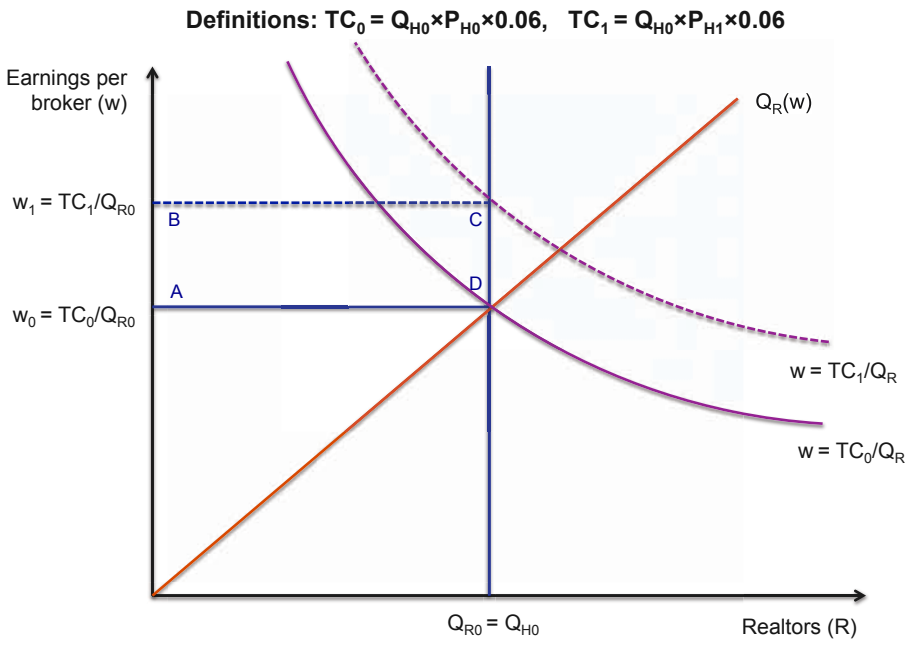
$$Q_H = Q_{H_0}, P_H = P_{H_0}, Q_R = Q_{R_0} = Q_{H_0}.$$

This last equality, $Q_{R_0} = Q_{H_0}$, is by assumption. As the figure is drawn, the supply of realtors exactly coincides with the number of houses on the market, and hence the wage w is equal to $0.06 \times P_H$. This equilibrium is efficient in that there is no excess supply or demand for realtors.

- Notice also the specific shape of the wage curve, $w = TC/Q_R$. Every point on this curve corresponds to the same total quantity of commissions. Changes in Q_R change the *number* of realtors among whom TC is divided, but they do not affect TC.

An example: An exogenous increase in P_H with no change in Q_H or Q_R

Figure 2



- Consider a rise in the price of housing from P_{H_0} to $P_{H_1} > P_{H_0}$. Assume for this example that $Q_{H_1} = Q_{H_0}$. That is, house prices rise because the location becomes more desirable but there is no change in the quantity of houses for sale.

- The increase in TC shifts up the wage locus, as depicted in Figure 2.

- Assume temporarily that there is no rise in Q_R. We probably *do* expect an increase in Q_R, since that the supply of realtors is upward sloping, but this provides a useful point of comparison.

- With no change in Q_R, the increase in the wage from w_0 to w_1 leads to a transfer of surplus of the area $ABCD$ from home-sellers to realtors. These transfers correspond to *rents*. We can see this because the marginal realtor is *not* indifferent between working and not working; rather, her wage w_1 exceeds her reservation wage w_0 by the amount CD. (The reservation wage is the realtor's value of leisure or the wage she could earn

in another activity. More precisely, it's the minimum wage she requires to be willing to work as a realtor.)

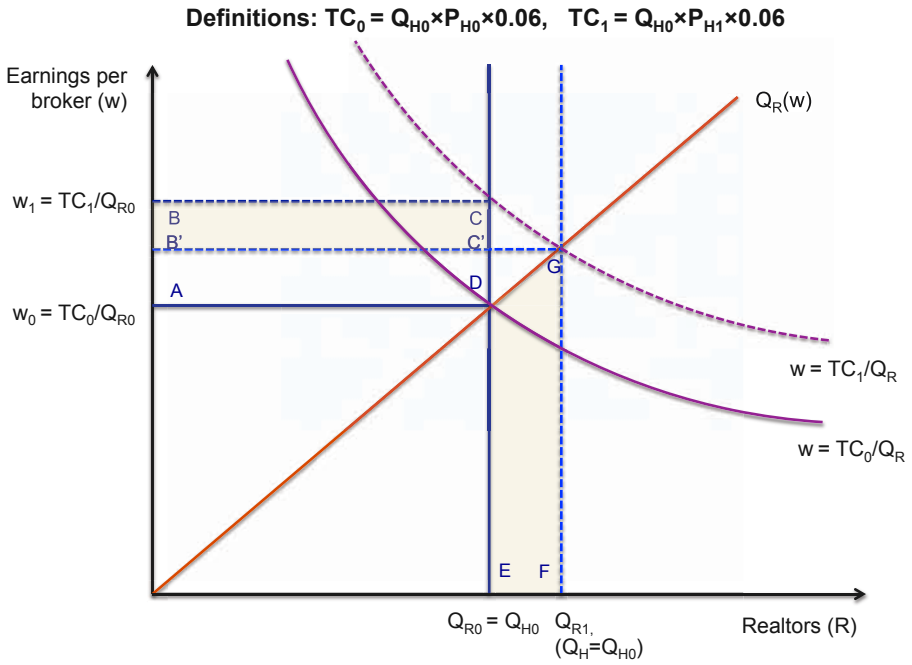
- Would this new hypothetical equilibrium be efficient, assuming Q_R stays fixed? The answer, surprisingly, is *yes*. Exactly the right number of realtors needed is active. Any more would be wasteful. Any fewer would be harmful to buyers. [Remember that there was a change in house prices without a change in house quantities. This is quite possible in the short-term. If a new biotech startup opens in Kendall Square, this will tend to raise housing values without increasing the number of houses available.]

- You object: what about the transfer of area $ABCD$ from sellers to realtors. But a *transfer* is not a social cost—it's simply a redistribution from one party to another. The realtors are earning rents, but in the scenario shown in Figure 2, there are no distortions in how resources are allocated.

- The distortions arise when additional realtors enter the market to attempt to capture these rents.

Allowing realtor supply to adjust

Figure 3



- The scenario in which no new brokers enter the market in response to a price increase is of course unrealistic. The increase in housing prices P_H causes commissions to rise. Responding to the increase in commissions, realtor supply rises. The new equilibrium supply of realtors is Q_{R1}.

- As we've conceptualized the problem, the increase in realtors creates no benefits for home-sellers. Thus, any gains accrue to realtors themselves. (One could argue that *some* of the gains accrue to real estate sellers and buyers; when there are more realtors competing, even with fixed commissions, these realtors may work harder to earn your business. However, the most natural and beneficial mechanism for them to compete—*lowering prices*—is thwarted by the fixed commission structure.)

- Let's break this down:

  - The rents paid to incumbent realtors are reduced by the area $BB'C'C$. Incumbent realtors continue to earn rents equal to $AB'C'D$.

- The commissions paid to entrant realtors equal $EC'GF$. However, most of this area, $EDGF$, simply compensates entrant realtors for their opportunity costs. The surplus accruing to entrant realtors is equal to the triangle $DC'G$.

- Thus, the deadweight loss from the increase in realtor supply is equal to the area $EDGF$. How do we know this? Three key observations:

  1. There is *no gain* to home-sellers from the entry of additional realtors. The same number of houses are sold.
  2. Moreover, home-sellers pay the same amount of commissions under either scenario: total commissions are fixed at TC_1 independent of realtor entry. This implies that areas $B'BCC'$ and $EC'GF$ are identical in size, so the reduction in rents to incumbents is precisely offset by payments to entrants.
  3. But whereas the area $B'BCC'$ is pure surplus, area $EC'GF$ is primarily payments for opportunity costs. The only surplus here is $DC'G$. This triangle reflects payments to entrant brokers in excess of their opportunity costs.

- The DWL is equal to the net loss in surplus, which is $EC'GF - DC'G = EDGF$.

This simple model has three empirical implications:

1. When house prices rise, the number of real estate brokers increases.
2. When house prices rise, average productivity per broker falls—that is, the number of houses sold divided by the number of brokers decreases.
3. When house prices rise, the wages of brokers rise by less than proportionately with the price increase.

3 Putting this hypothesis to the test

The figures from Hsieh-Moretti make the case very clearly. I will discuss these figures in class.

4 Interpretation

The scenario depicted by Hsieh and Moretti is what economists call a *dissipative* externality. The rents generated by the fixed commission structure are largely dissipated (consumed) by rent-seeking by entrant brokers. Here's the argument:

1. Holding constant the number of houses on the market, an increase in prices raises total commissions. How much each individual income each broker receives is inversely proportional to the number of new brokers entering the market. Hence, since total broker earnings are fixed at $TC = 0.06 \times P_H \times Q_H$, broker entry simply *transfers* income from incumbents to entrants.

2. Home-owners also receive no benefit from more brokers entering the market. Why? In a *competitive* model, new entry would lower the broker price and increase homeowner surplus. But since the commission is fixed, this cannot happen.

3. Finally, total social welfare is reduced by the entry of these new brokers into the real estate sector relative to a setting where they did not enter. Why? As above, these entrant brokers are foregoing other productive activities to enter the real estate sector—giving up jobs that they would otherwise have held, or foregoing leisure that they otherwise would have enjoyed. This is socially wasteful because the entry of these brokers creates no net benefits; it simply transfers income from incumbents to entrants. Their leisure or labor in other activities is lost but nothing is gained in net.

Some other markets that operate a bit like real estate brokers:

- Taxi rides: Why are there too few cabs available when it's raining, but too many at non-peak hours (e.g., 11am on Wednesday morning)?

- Lotteries: Each entrant to a lottery reduces the expected payout for every other entrant.

- Handouts: Organizations that give away free goods, such as soup kitchens that dispense meals, typically queues to ration demand. Those who want to receive free goods must queue up to get served. If queues were not lengthy and unpleasant, demand would generally outstrip supply.

5 Questions for consideration

1. Are there any reasons to think that the entry of new brokers in response to rising housing rise is *not* a pure social waste?

2. How could the real estate brokering market be modified to produce a more socially efficient outcome?

3. 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."]

4. Are the deadweight losses larger or small when the broker elasticity of supply is higher (i.e., $\partial \ln Q_R(w) / \partial \ln P_H$ larger)?

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