EC 360: Industrial Organization
Market Definition & Market Power

Brett Garcia

Market definition

- Up until this point in the class, we've made several assumptions about markets and market power
  - We know exactly what constitutes a market
  - Exerting market power is easy
- In practice, defining the market is the most important step in antitrust litigation
  - Are cars and trucks similar enough to be in the same market?
  - Are buyers and sellers in Eugene and Salem competing with each other?
  - Are the markets for cars and food the same size?
  - Is it easier to exert market power for the food market, or the sports car market?

Market definition

- There are two measures that define a market
  - **Geographic space**: how large is the area of the market?
  - **Product space**: what groups of products are close enough substitutes to be considered in the same market?
- We rely on **cross-price elasticity** to analyze both the geographic and product space
  - Products A and B are substitutes if their cross-price elasticity is positive

$$\theta_{AB} = \frac{\%\Delta Q_A}{\%\Delta P_B} > 0$$

- High cross-price elasticities provide evidence of close substitutes
  - Products A and B could the exact same good in different locations, similar goods in the same location, or a combination of both

Market definition: DOJ and FTC horizontal merger guidelines

- The DOJ and FTC detailed how to define a market both geographically and in the product space in their merger guidelines (1992)
- The guidelines consider the substitutability of both sellers and buyers, thus we will consider four separate measures
  - Geographic demand substitutability
  - Geographic supply substitutability
  - Product demand substitutability
  - Product supply substitutability
- The smallest market that satisfies all four of these measures is considered the market

Merger guidelines: defining geographic markets

- Let's define a geographic market for buyers
  1. Choose a relatively small geographic area
  2. Suppose all producers in the area simultaneously raise their prices
  3. Will buyers in that area leave the area, thus making the price hike unprofitable?
  4. If the buyers leave, expand the area and repeat steps (2) and (3)

     If the buyers stay, then this is the geographic market for buyers
- Intuitively, we are finding the largest area that consumers are willing to travel to buy goods

Merger guidelines: defining geographic markets

- Let's define a geographic market for sellers
  1. Choose a relatively small geographic area
  2. Suppose all producers in the area simultaneously raise their prices
  3. Will firms outside of the area undercut you, thus making the price hike unprofitable?
  4. If firms undercut you, expand the area and repeat steps (2) and (3)

     If firms do not undercut you, then this is the geographic market for sellers
- Intuitively, we are finding the largest area that a firm can profitably sell their goods

Merger guidelines: evidence of geographic markets

- The DOJ accepts several different types of evidence on geographic boundaries
  - Shipment patterns of firms in the area
  - Evidence of buyers having actually considered shifting their purchases among sellers at different locations, especially evidence coming from price changes
  - Price movements of similar products, which cannot be explained by changes in the cost of inputs, income, or other geographic variables
  - Transportation costs
  - Cost of local distribution
  - Excess capacity of firms outside the area

Merger guidelines: defining product markets

- Let's define a product market for buyers
  1. Choose a single good
  2. Suppose all producers in the area simultaneously raise their prices
  3. Will buyers choose to purchase a different good, thus making the price hike unprofitable?
  4. If buyers purchase a different good, expand the area and repeat steps (2) and (3)

     If buyers do not purchase a different good, then this is the product market for buyers

Merger guidelines: defining product markets

- Let's define a product market for sellers
  1. Choose a single good
  2. Suppose all producers in the area simultaneously raise their prices
  3. Will providers of a similar good be able to undercut the original good, thus making the price hike unprofitable?
  4. If they undercut the good, expand the area and repeat steps (2) and (3)

     If they do not undercut the good, then this is the product market for sellers

Merger guidelines: evidence of product markets

- The DOJ accepts several different types of evidence on product markets
  - Evidence of buyers' perceptions of the similarity of products, particularly if buyers have contemplated switching between products due to price
  - Similarities or differences in price movements over time that cannot be explained by costs, inputs, income, or other product variables
  - Similarities or differences in product usage, design, composition, or other technical characteristics
  - Evidence of sellers' perceptions of the substitutability of products, particularly if the perceptions influenced business decisions

Modern evidence of markets

Recent advances in technology and statistics has substantially improved the methods we use to define markets

- Structural model: calculate cross-elasticities of demand (supply) to determine if consumers (producers) view the goods as close substitutes

- Partial adjustment approach: assume that prices in the same market reach a long-run equilibrium, and measure how prices reach that equilibrium

- Granger causality approach: determines if prices in one area caused prices in another area to move

- Residual demand approach: estimate the residual demand for firms and calculate price elasticities of each firm to determine if a group of firms can profitably raise prices

Market power

Market power

Monopolies derive their market power from their ability to set a price that induces consumers to buy their good

- The market power of a monopoly is contingent on its ability to **profitably** raise prices above the competitive level
- There's no way for a monopoly to coerce a consumer to buy their good
- Let's show how a firm's *MR* depends on **own price elasticity** η

$$MR = P\left(1 - \frac{1}{|\eta|}\right)$$

$$\eta = \frac{\%\Delta Q}{\%\Delta P} < 0$$

Measuring market power: the Lerner index

- The **Lerner index** allows us to measure market power

$$\lambda = \frac{P_m - P_c}{P_m}$$

- Perfect competition and profit maximization implies $P_c = MC = MR$

$$\begin{aligned}\lambda &= \frac{P_m - MC}{P_m} \\ &= \frac{P_m - MR}{P_m}\end{aligned}$$

- Recall $MR = P\left(1 - \frac{1}{|\eta|}\right)$
  Thus, the Lerner index simplifies

$$\lambda = \frac{1}{|\eta|}$$

Measuring market power: dominant firm Lerner index

- While true monopolies are rare, we often observe markets that can be modelled as a **dominant firm**
  - Recall that the dominant firm acts as a monopolist, after accounting for the **competitive fringe**
- The Lerner index for a dominant firm

$$\lambda = \frac{S}{|\eta| + \epsilon(1 - S)}$$

  - S is the dominant firm's market share
  - η is the price elasticity of market demand
  - ϵ is the price elasticity of supply for the competitive fringe

Measuring market power: dominant firm Lerner index

- What happens to λ as the dominant firm's market share rises?
- What happens to λ as the fringe supply becomes more elastic?
- What happens to λ as the price elasticity of demand becomes more elastic?

$$\lambda = \frac{S}{|\eta| + \epsilon(1 - S)}$$

Market power and market definition

- The definition of a market is relatively subjective, which means market power is prone to errors
  - We need a realistic market definition; however, the Lerner index has a self-correcting mechanism

$$\lambda = \frac{S}{|\eta| + \epsilon(1 - S)}$$

  - Thought exercise 1
    Suppose the market is too narrow
    Then the observed price elasticity will be high
    But firms will have a larger market share
  - Thought exercise 2
    Suppose the market is too broad
    Then each firm will have a smaller market share
    But the price elasticity will be low

Market power in practice

Market power in practice

Now that we've established some theory, let's begin to look at how we can apply it in practice

- Market power is a continuous measure, not discrete
- All firms have some level of market power, even if it's so small we ignore it
- In practice, we tend to define some threshold of market power that is worth caring about

Claim: more (less) elastic consumers pay a lower (higher) price

- Graph 5.1

Market power in practice: excess profit

- Along with Lerner indices, **excess profit** can be helpful in measuring market power
  - Excess profit indicates a firm is earning greater return on its resources than is necessary to stay employed
  - Excess profit should attract entrants to the industry
  - If we do not observe entrants, we expect the firm to be exerting market power, and/or barriers to entry
- Accounting data is easy to collect; however, this data is not equivalent to economic profit

Economic profit

- **Economic profit**

$$\Pi = p \cdot q - c(q) - D - \gamma$$

  - D is economic depreciation of capital
  - γ is the opportunity cost of the asset
  - D and γ are *very* difficult to measure

Entry barriers

- Entry barriers play an important role in market power, thus measuring the height of such barriers is of interest
  - Evaluate market conditions and market technology: are there patents, large sunk costs, limited supply of inputs?
  - Observe entry into markets with excess profit