



Defining Relevant Markets and Assessing Market Power

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Outline

- Introduction: Market Power and Its Relevance to Telecom Regulation
- Defining Relevant Product Markets
- Defining Relevant Geographic Markets
- Identifying Firms with Market Power
- Regulating Firms with Market Power

Introduction

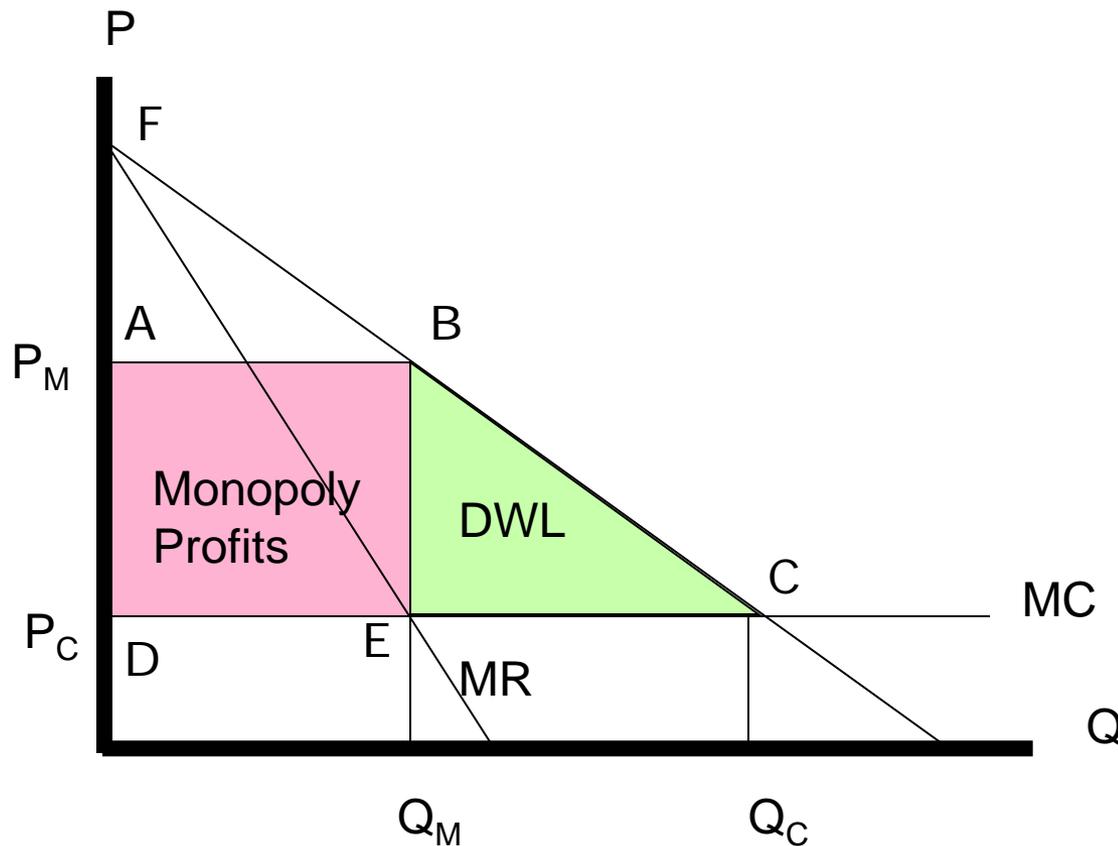
- Definitions of “Market Power” (“SMP”)
 - The ability to raise price by restricting output.
 - The ability profitably to raise and maintain prices above competitive levels.
 - “...the power to behave to an appreciable extent independently of competitors customers and ultimately consumers.” (EC Framework Directive)

Introduction: Consumers' and Producers' Surplus

- *Consumers' Surplus*: The total difference between the dollar value to consumers of each unit of output and the price the consumer pays.
- *Producers' Surplus*: The total difference over all units of output between the price paid for each unit and the marginal cost of that unit.
- *Social Surplus*: The total difference between the dollar value to consumers of each unit of output and its marginal cost (*i.e.*, the sum of consumers' and producers' surplus).

Introduction: Consumers' and Producers' Surplus

- Prices Under Monopoly versus Competition



Introduction

- Costs of Monopoly / Market Power (SMP)
 - Deadweight loss resulting from reduction in total social surplus
 - Note that firms can exercise market power not only by raising price, but also reducing quality or variety.
 - Shift from consumers' surplus to producers' surplus ??
 - "*X-Inefficiency*"
 - Dynamic Inefficiency
 - Possible reduction in competition in other markets

Introduction

- For telecom regulators, the analysis of market power is critical in determining, *inter alia*, whether to:
 - Regulate and, if so, which form of regulation to impose on carriers;
 - Forbear from regulation
 - Permit mergers; and
 - Permit carriers to acquire additional spectrum

Introduction

○ Ex Ante vs. Ex Post Regulation

- To deal with SMP, regulators may impose *ex ante* or *ex post* regulation.
- *Ex ante* regulation imposes costs on the regulated firm, the regulator, and consumers. As a result, *ex ante* regulation is generally imposed only on firms that possess market power.
- Because *ex ante* regulation is not fool proof, *ex post* regulation is also required.

Introduction

- In the next sections, we will take the “traditional” approach to defining relevant markets and evaluating market power.
- There are a number of other approaches to measuring market power that do not rely on market definition, however.
 - *See, e.g., Kaplow & Shapiro, “Antitrust” in 2 Handbook of Law and Economics* (Polinsky and Shavell eds., 2007) (available at <http://faculty.haas.berkeley.edu/shapiro/>)

Relevant Product Markets

- Relevant Product Markets
 - *Hypothetical Monopolist Test*: Assume that the products under study are supplied by a single hypothetical monopolist. If this hypothetical monopolist were the only present and future seller of the products, would it likely impose a “**S**mall but **S**ignificant and **N**ontransitory **I**ncrease in **P**rice”? – “**SSNIP Test**”
 - SSNIP developed in U.S., but now adopted by most competition authorities

Relevant Product Markets

- If such a price increase would not be profitable, then broaden the group of products in the market and repeat the SSNIP test.
 - “*Smallest Market Principle*” – Start with the smallest group of products. Only expand if a SSNIP would not be profitable.
 - *Note:* Depending on where you start and which products you view as next best substitutes, you could get different relevant product markets in differentiated product markets.
 - Example: Is DSL a separate product market. If not, are DSL and cable modem service a separate market, If not, test for FTTH, fixed wireless, and satellite.

Relevant Product Markets

- Where there is price discrimination, it may be necessary to define additional relevant product markets consisting of a particular use or uses by groups of buyers.
 - Ex. 1: In the U.S. long-distance market, price differences between large business users and residential users was so great that, under the hypothetical monopolist test, they represented separate markets. Accordingly, the FCC defined separate markets for residential and medium-to-large business.
 - Significantly large price differences may imply separate markets.



Relevant Product Markets

- In the U.S., the focus is only on demand substitution in defining relevant markets.
 - Supply substitution is considered only in identifying actual and potential market participants
- In the E.C. and much of the rest of the world, the relevant market analysis also includes consideration of supply substitution.
- Note: While the two approaches may yield slightly different relevant markets, the end result of the competitive analysis should be the same under either approach.

Relevant Product Markets

- Evidence to Consider:
 - Evidence that buyers have shifted or have considered shifting purchases between products in response to relative changes in price or other competitive variables
 - Econometric evidence of the own-elasticity and cross-elasticities of demand between products.
 - Anecdotal evidence
- Comparison of product features, price and customer usage
 - Ex.Mobile BB service v. cable modem service.

Relevant Product Markets

- Evidence to Consider:
 - Evidence that sellers base business decisions on the prospect of buyer substitution in response to changes in relative prices
 - Internal studies and other documents that address such substitution, including marketing records and sales staff.
 - Customer surveys
 - E.g., Wireline carriers frequently conduct studies of wireline-wireless substitution
 - Evidence of how sellers track and respond to price changes.
 - The timing and cost of switching products

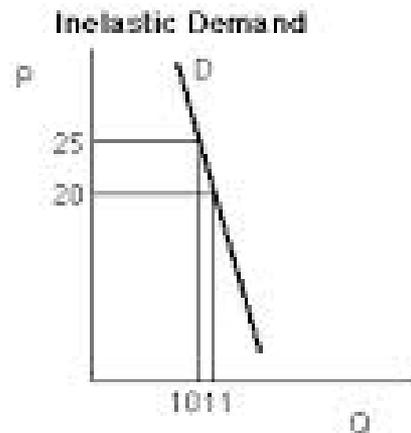


Relevant Product Markets

- Analytical Techniques
 - Calculating cross-elasticities and own elasticities of demand
 - Critical loss

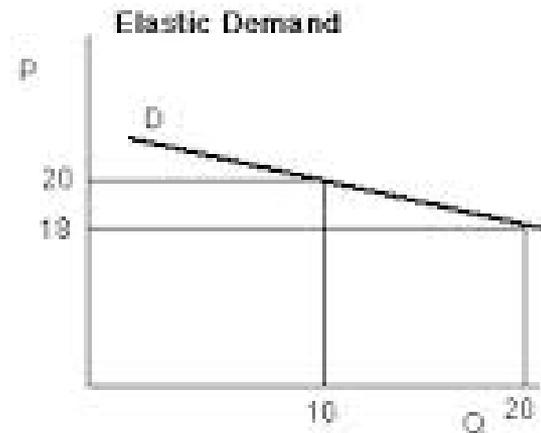
Analytical Techniques

- Own-price elasticity of demand
 - Shows relationship between % change in price of product and % change in quantity demanded of the same product



$$\frac{\frac{1}{10 + 11 + 2}}{\frac{5}{20 + 25 + 2}}$$

= 0.45 Inelastic



$$\frac{\frac{10}{10 + 20 + 2}}{\frac{2}{18 + 20 + 2}}$$

= 8.3 Elastic

Analytical Techniques

- Cross-price elasticity of demand
 - Shows relationship between % change in price of product and % change in quantity demanded of a *different* product
 - Example: Estimate +0.25 as cross b/w price of Coke and Pepsi
 - 10% increase in price of Coke leads to a 2.5% increase in the quantity sold of Pepsi (substitutes)



Analytical Techniques

- Econometric Estimation of Demand
- Would enough consumers shift to products outside of proposed market in response to a price increase such that the price increase is unprofitable? Want to know:
 - How much volume is expected to be lost following a price increase, which is reflected in the own price elasticity of demand? and
 - To which products or services the lost sales go, which is captured in the cross price elasticities of demand.



Analytical Techniques

- Historical data on prices, volumes, and other variables provides information on those two important elements of market definition
- Demand estimation also requires decisions about:
 - Which products to include in analysis
 - Structure of demand and which econometric techniques are most appropriate for the analysis

Analytical Techniques

- Multiple Regression Analysis

$$\ln(Q_t^1) = b_0 + b_1 \ln(P_t^1) + b_2 \ln(P_t^2) + \sum_{i=1}^n b_{i+2}(X_{i,t}) + u_t$$

- Where:
 - b_1 is the own price elasticity of demand
 - b_2 is the cross price elasticity of demand
 - X_i are the other control factors/independent variables

Analytical Techniques

○ Critical Loss

- The critical loss identifies for any given price increase the quantity in sales that can be lost before the price increase becomes unprofitable. Application of this definition is said to be a break-even analysis

Analytical Techniques

○ Critical Loss – Example

- $P = \$1$ $Q = 100$ marginal cost = 10 cents
Fixed costs = \$10 (note fixed costs are irrelevant for the purpose of this example but they are included for completeness)
Profit = \$80
- If prices rise by 5% then $P_{\text{New}} = \$1.05$
- If profit is to be no less than \$80, then Q_{New} can be no less than 94.73. That is, the actual loss can be no greater than $100 - 94.73 = 5.27$. Thus, 5.27 is the critical loss. If the firm loses more than 5.27 units in response to the 5% price increase then price increase is unprofitable.

Analytical Techniques

- Critical Loss – Three Step Analysis
 1. Estimate critical loss
 2. Estimate actual loss
 3. Compare the critical loss to the actual loss. If
 - Actual loss $>$ critical loss, market must be expanded
 - Actual loss $<$ critical loss, market definition is sustainable for that price increase.

Relevant Product Markets

- Example 1: *EchoStar-DirecTV Merger*
 - What is the relevant product market, which includes Direct Broadcast Satellite (DBS) service ?
 - Just DBS?
 - DBS plus high-capacity Cable (i.e., >50 channels)?
 - DBS plus all Cable?
 - All Multichannel Video Programming Distributors (MVPDs), including, e.g., C-band satellite?
 - All MVPDs *plus* broadcast television stations?

Relevant Product Markets

- Example 2: AT&T Non-dominance Petition
 - What are the relevant product markets for interstate long-distance telephony service?
 - Are residential customers in the same market as large and medium size business customers?
 - Are the same services provided to both customer classes?
 - With respect to voice telephony:
 - (1) What are the relative per-minute prices?
 - (2) Are there other relevant contract terms – e.g., minimum contract periods, minimum monthly bills?

Relevant Product Markets

- Example 2: AT&T Non-dominance Petition
 - What are the relevant product markets for interstate long-distance telephony service?
 - Residential vs. business.
 - Should we define a separate relevant product market for low-volume residential customers? This is an example of a price discrimination market.

Relevant Product Markets

- Example 3: Disaggregation by Capacity
 - Should we define separate relevant product markets for different capacities of transport of leased lines?
 - Ans: Very likely Yes, because of price discrimination. That is, price does not rise proportionately with capacity. Rather, the cost per bit declines quickly as capacity increases.
 - E.g., the cost of 15 Mbps FIOS service is \$45 per month; 50 Mbps is \$55 per month.

Relevant Product Markets

- Example 4: Bundled Services
 - Where two or more services are provided in a bundled offering as well as on a stand-alone basis, is the bundled offering in the same relevant market?
 - Examples: (1) bundled local and long-distance service; (2) bundled telephone and DSL service; (3) bundled wireless voice and data services; and (4) bundled wireless and wireline telephone services.
 - What price does one use in applying the SSNIP test?

Relevant Geographic Market

- *Hypothetical Monopolist Test: “[T]he region such that a hypothetical monopolist that was the only present or future producer of the relevant product in that region would profitably impose at least a ‘small but significant and nontransitory’ increase in price...”*
 - Usually, one considers how far buyers will travel to find substitute sellers.

Relevant Geographic Market

- Application of hypothetical monopolist test to wireline telecommunications.
 - How far will a customer move in response to a SSNIP? *Answer:* He or she will most likely not move.
 - Therefore, each customer is a separate relevant geographic market.
 - But, you can aggregate customers facing similar competitive choices.
 - **Can one aggregate further?** E.g., if there is uniform pricing over a broader area?
 - *Answer:* Maybe!

Relevant Geographic Market

- Example 1: Direct Broadcast Satellite Service
 - In *EchoStar* merger, the question was how to aggregate individual MVPD customers.
 - Basic principle was to aggregate customers facing similar competitive choices. Since the three main competitors were the two DBS providers (which had national footprints) and the local cable TV company, the FCC defined relevant market as the franchise area of a local cable operator.

Identifying Firms Possessing Market Power

- After defining the relevant markets, one must consider whether any firms competing in those markets possess SMP
- Factors to Consider
 - Market Shares – But what should be measured?
 - Subscribers
 - Revenues
 - Units – e.g., minutes
 - Capacity

Identifying Firms Possessing Market Power

- Factors to Consider (cont.)
 - Trends in market shares
 - Excess capacity in the industry
 - Barriers to entry

Identifying Firms Possessing Market Power

- Factors to Consider (cont.)
 - Pricing Trends, particularly where the dominant firm is a price leader
 - Special problem when dominant firm is subject to price regulation. Relevant question is whether there is headroom under price cap or whether the cap is binding.
 - Profits of Dominant Firm
 - Again, there are special problems if the dominant firm is subject to price regulation.
 - More generally, there are problems in determining profit rates, and economists have repeatedly pointed out potential problems with using accounting profits.

Identifying Firms With Market Power

- Example: AT&T Nondominance Petition
 - AT&T's *business* services were given streamlined regulation in 1990.
 - In 1994, AT&T sought to be declared non-dominant in all interstate long-distance services.

Identifying Firms With Market Power

- AT&T Nondominance Petition (cont.)
 - Relevant product markets:
Distinguished mass market (residential and small business) from larger business market.
 - There may need to be additional disaggregation.
 - Relevant geographic market:
Commission precedent was that there was a single nationwide market, but AT&T had a monopoly on traffic to and from Alaska.

Identifying Firms With Market Power

- AT&T Nondominance Petition (cont.)
 - Market Shares for Residential
 - @ 55% of revenues; 59% of minutes; but over 70% of residential subscribers
 - Why the variation?
 - Trends in Market Shares: AT&T share was falling steadily.
 - Excess Capacity: 4 new nationwide fiber networks were under construction and nearing completion.

Identifying Firms With Market Power

- AT&T Nondominance Petition (cont.)
 - Barriers to Entry: Low because of excess fiber transport capacity so carriers could enter easily as facilities-based carriers or resellers.
 - Pricing Trends: Average revenue per minute (ARPM) for mass market customers was declining, but basic schedule rates were only declining because of price caps. AT&T always raised basic schedule prices to the limit allowed by the cap. Competitors immediately copied.

Identifying Firms With Market Power

- Example: AT&T Nondominance Petition
 - The evidence suggested that AT&T did not possess individual market power, but that there was some evidence of collusion with respect to low-volume residential subscribers.

Identifying Firms With Market Power

- A more recent example of evaluating whether a firm possesses SMP can be found in the *Qwest Phoenix Forbearance Order* (released June 22, 2010) (available at <http://www.fcc.gov/headlines2010.html>).
 - *Note:* This order focused on the petitioner's failure to demonstrate that it lacked market power and was therefore entitled to be relieved of dominant carrier regulation.



Regulating Firms with SMP

- Traditional Monopoly Regulation Addresses Classical Market Power
 - Regulate retail rates
 - Prevent undue discrimination, often through tariffing requirements
 - Review capital investments to prevent gold-plating (under rate of return regulation)

Regulating Firms with SMP

- When competition is introduced into telecommunications, exclusionary market power becomes an issue.
 - For example, if a former monopoly incumbent has market power over an essential input or if it has retail market power in a complementary market, it may exploit this market power to disadvantage new competitors.

Regulating Firms with SMP

- Incumbent providers with *exclusionary* market power in one market that compete in another may:
 - Engage in cost shifting if rate regulation is based on costs; and/or
 - Raise rivals costs through:
 - Denial of access to essential facilities and services
 - Delaying the grant of access to such facilities and services
 - Degrading the quality of access.

Regulating Firms with SMP

- To address issues of exclusionary market power, regulators have adopted various types of Competitive Safeguards
 - Outright prohibition on providing a product or service (*AT&T Consent Decree*)
 - AT&T local operating companies (BOCs) were prohibited from:
 - Providing interstate long-distance services,
 - Providing information services, and
 - Manufacturing telecommunications customers premises equipment, though they could sell equipment manufactured by others.

Regulating Firms with SMP

- Competitive Safeguards – Types (cont.)
 - Tariffing requirements
 - Notice requirements
 - Cost support requirements
 - Accounting separation (e.g., separate books of account and prescribed methods of recording and separating costs and revenues)
 - Rate regulation of regulated wholesale monopoly services

Regulating Firms with SMP

- Competitive Safeguards -- Types
 - Separate subsidiary requirements and associated non-discrimination requirements
 - Wide possible variation in the degree of separation -- Computer II's "Maximum separation" vs. 1996 Act's separate subsidiary requirements for BOC long-distance vs. minimal structural separation for independent incumbent LECs.

Regulating Firms with SMP

- Competitive Safeguards – Types (cont.)
 - Imputation rules to prevent price squeezes
 - What is the appropriate cost test?
 - $P < MC$? $P < AVC$? $P < ATC$
 - Types of Price Squeeze Scenarios
 1. Single output, single input, similar rate structure
 2. Single output, single input, different rate structures
–Ex. Dial-up Internet access
 3. Bundled products, single input, possibly different rate structures.

Regulating Firms with SMP

- Competitive Safeguards – Types (cont.)
 - Regulation of interconnection terms and conditions
 - Quality reporting requirements, including performance metrics
 - Importance of Electronic OSS

Regulating Firms with SMP

- Competitive Safeguards – Types (cont.)
 - Resale requirements
 - Unbundling requirements
 - 1996 Act requires ILECs to provide access to certain unbundled network elements
 - Network Interface Disclosure Rules
 - Enforcement Process to Address Anticompetitive Conduct

Selected References

- U.S. Dept. of Justice & the Federal Trade Commission, *Horizontal Merger Guidelines* (Issued Aug. 19, 2010) (available at <http://www.ftc.gov/bc/index.shtml>)
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- Gregory J. Werden, *The History of Antitrust Market Delineation*, 76 *Marquette Law Review* 123 (1992).
- Gregory J. Werden, *Market Delineation Algorithms Based on the Hypothetical Monopolist Paradigm* (Economic Analysis Group, Discussion Paper No. 02-8, 2002), (available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=32782).



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