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Some Basic Concepts of Market Power for State Public Utility Commissions to Consider

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Briefing Note: Some Basic Concepts of Market Power for State Public Utility Commissions to Consider

Market power is a highly complex topic. Decisionmakers and even analysts find it difficult to know when market power presents a serious enough problem to warrant government action. Market power poses a particularly difficult challenge for state public utility commissions.

Under the traditional industry structure, utilities possess comprehensive monopoly power within the markets they operate. The regulator's job was to control the prices of the monopoly utilities commensurate with the public interest. The intent was to prevent utilities from acting like unregulated monopolists. State public utility commissions increasingly have had to address issues surrounding market power because of the liberalization of the utility sectors. Market power can originate from several sources. Under a restructured utility industry, the regulator's job shifts to ensuring for the public that utilities do not exercise excessive market power in those sectors that are naturally competitive. Market-power problems can arise from the mispricing of utility-affiliate transactions, cost-shifting, cross-subsidization, discriminatory regulated service from "essential facilities," mandatory tying of "essential facilities" service and unregulated service, and discriminatory release of information from a utility to an affiliated entity.

This paper identifies some basic concepts that state commissions should keep in mind when making decisions that relate to the competitiveness of markets they either directly regulate or monitor. Its major message is that state commissions should take a measured approach to market power. They need to do sophisticated analysis to detect and measure market power, as well as to evaluate the harm to consumers. Without this information, a commission is apt to make a wrong decision that acts against the public interest.

I. Distinguishing between benign and excessive market power

Market power is a highly contentious topic in economics and antitrust law. Sharp disagreements exist in the economic and legal professions over the prevalence of market power, how to measure and detect it, and how to mitigate it when it poses a serious problem. The Chicago school of economics tends to believe that the market power exercised by firms is mostly transitory, as entry and other dynamics will emerge to dissipate any market power. As the former University of Chicago Nobel Prize winning economist George Stigler once remarked, competition is more like a tough weed than a delicate flower. At the other end of the spectrum are economists who believe that market power is a serious social problem arising from any number of reasons, particularly entry barriers.

The concern over market power should not center on whether a market is perfectly competitive; hardly any market meets all the attributes of a perfectly competitive market. The more relevant question is whether the market power that likely exists is significant enough to cause substantial harm to consumers. This distinction between "benign" and "excessive" market power is often ignored in market-power analysis. A firm might not always exploit the market

power it possesses to the detriment of consumers. Firms often retain or acquire market power through efficient activities or superior products rather than through anticompetitive activities. Punishing a firm that has acquired market power for these reasons would be ill-advised: consumers have not suffered any harm (and in fact have probably benefited), and incentives for future product and cost-saving innovations would erode.

Anticompetitive practices, on the other hand, are deliberate acts by a firm or group of firms to gain market power and then use that market power to block entry by a potential competitor, to increase prices above competitive levels, or to reduce output so as to drive up prices. These practices warrant concern and mitigation by the appropriate government authorities. Such acts include collusion among firms, driving out rivals with predatory practices, the erection of entry barriers, and any action that deprives consumers of an efficient supply of a product at a competitive price. Firms do not always fully exploit their market power because of possible political repercussions. A firm, for example, might fear a congressional investigation or an antitrust case filed against it.

II. Definition of market power

Market power is commonly defined as the ability of a firm to profitably set a price above competitive levels for a sustained period without substantial loss of sales. The competitive price corresponds to a firm's long-run marginal cost (which includes a normal profit earned on fixed costs). A firm with market power, therefore, would be able to charge a price above marginal cost. For this condition to continue over a long period—for example, for a number of years—entry barriers must exist.

Viewed differently, a firm has market power when its decision regarding how much to supply to the market affects the price it receives. In economics parlance, this condition requires that the firm face a downward-sloping demand curve. A firm with market power, for example, can sell more by lowering its price, or sell less by increasing its price. In a competitive market, on the other hand, a firm faces a perfectly horizontal demand curve; if it tried to set a price above the competitive price, it would sell nothing. The firm is, in effect, a price taker that maximizes its profit by selling at a price corresponding to market demand and supply conditions.

Any firm, whether or not it has market power, would maximize its profits by supplying its product at a level at which marginal revenue equals marginal cost. For a competitive firm, this level would correspond to where price equals marginal cost. For a firm with market power and facing a downward-sloping demand curve, the profit-maximizing price would exceed the firm's marginal cost, thus producing what economists call "monopoly rent." In a perfectly competitive model, firms are able to set prices above marginal cost for only a short period until they lose customers to lower-priced competitors or until new firms enter the marketplace. The primary explanation for prices above competitive levels (i.e., marginal cost), therefore, is the presence of entry barriers.

III. Indicators of market power

A. Market concentration

Economic theory, together with empirical evidence and antitrust-enforcement principles, suggests that market concentration is only one piece of the puzzle in determining whether a firm or group of firms has sufficient market power to engage in anticompetitive abuses. These abuses can include collusion and the erection of artificial barriers. A careful investigation of market power entails several steps: (1) defining the relevant market, (2) measuring market concentration, (3) determining conditions of entry, (4) examining collusion opportunities for firms in the designated market, and (5) investigating other relevant market characteristics.

One commonly used measure of market concentration is the Herfindahl-Hirschman index (HHI). The HHI is calculated as the sum of the squared market shares of each firm in a designated market. The challenge for the HHI, as well as for other market concentration measures, is defining the relevant market. The relevant market includes firms selling “close” substitutes for the product under examination; it excludes even closely related products when sold in distinctly different geographic markets. As two eminent economists once said, the relevant market is “that set of suppliers and demanders whose trading establishes the price of a good or service.” Starting in the early 1980s, federal authorities have used HHIs to evaluate mergers by calculating the HHI before and after a merger to show the increase in market concentration.

The HHI is an indicator of market structure, namely industry concentration. As such, it does not measure market performance, such as rate of return and price-marginal cost margin. A higher HHI indicates only the greater likelihood for market power without measuring the magnitude of any harm that might ensue. Higher market concentration, for example, raises the chances of successful explicit or tacit collusion. A “contestable” market can have an extremely high HHI and the outcomes of a competitive market when entry barriers are minimal. In antitrust cases, the HHI is applied only as a screening tool to help determine whether additional analysis of potential market power should be carried out.

B. A direct measure of market performance: The Lerner Index

The Lerner index represents the true measure of market power based on a firm’s performance. The performance is the price charged by a firm relative to its marginal cost, which is the economic definition of market power.

The Lerner index measures the price-marginal cost gap as the inverse of the price elasticity of demand facing a firm. (The index measures all the values at the firm’s profit-maximizing output.)

The Lerner index, LI, is defined as:

$$LI = (P - MC)/P = 1/e,$$

where

- P = price
- MC = marginal cost
- e = price elasticity of demand facing a firm

The Lerner index for a perfectly competitive market is zero, while its value can take on a value close to one for a pure-monopoly market. A value of zero means that price equals marginal cost, or that the firm faces an infinitely high demand elasticity, which translates into the firm losing all sales if it attempts to set a price above the competitive level.

A value close to one means the firm's marginal cost is low relative to the price it charges. The more the Lerner index deviates from zero, the greater the measured market power. As the above relationship illustrates, the higher the price elasticity of demand facing a firm, the closer the price is to the perfectly competitive level (i.e., marginal cost). Market power is, therefore, less severe. This linkage makes intuitive sense: high price elasticity means that the consumer has good substitutes for the product in question. A firm could not raise its price without losing sales to the suppliers of the same product or to substitutes. Firm-specific elasticity for an electric distribution utility, for example, will tend to be somewhat higher if a substitute energy source, such as an independent natural gas distribution company, competes in the same service territory.

This specific elasticity provides a good measure of market power for individual firms. Measured at its profit-maximizing price and sometimes referred to as the "residual price-demand elasticity," it becomes higher as (1) a firm's market share decreases, (2) the price elasticity of market demand increases, or (3) the price elasticity of the supply of other firms increases (i.e., an increased willingness and ability of other firms to enter and expand in respond to any attempted price increase).

Illustrating the measurement of the residual price-demand elasticity, assume we have an industry with a dominant firm-competitive fringe market structure. If one firm is a price setter and faces smaller, price-taking firms, it is called a "dominant firm." The dominant firm typically has a high market share, with the price-taking firms (fringe firms) each having a very small share of the market, although collectively they may have a substantial share of the market. Let us also assume that the product being sold has a market demand elasticity of -0.3 and a price elasticity of fringe supply of one, and that the dominant firm has a market share of 60 percent. We can express the residual demand elasticity for the dominant firm as

$$e_d = e_m/MS_d - (1 - MS_d)e_s/MS_d,$$

where e_m is the market demand price elasticity, MS_d is the market share of the dominant firm, and e_s is the price elasticity of fringe supply.

Applying the above information, the residual elasticity equals 1.167, which translates into a Lerner index of 0.857. This is equivalent to the dominant firm's marginal cost being less than 15 percent of its profit-maximizing price—a result reflecting the firm's possession of a high degree of market power.

For most industries, it is difficult to calculate marginal cost or the price elasticity of demand facing a firm, which is a major reason why the Lerner index is not as widely used as the HHI in market-power investigations. (In some applications, analysts substitute average variable cost for marginal cost to measure the Lerner index.) In the electric sector, where good cost data is available, market monitors have applied the Lerner index to measure the magnitude of market power.

C. Entry barriers

While some economists and market experts place great importance on market concentration as an indicator of market power, others emphasize entry barriers. The latter group would, for example, contend that a firm or group of firms operating in a market with high demand and supply price elasticities (i.e., a high supply-and-demand response to changes in price) would have little market power, notwithstanding a high market share.

Entry barriers prevent a firm from selling its products in a market where existing firms are earning economic profits. (“Economic profits” is the term economists use to describe profits exceeding a competitive return.) Entry barriers prevent a more efficient entrant from competing with less efficient firms. Entry analysis performed by antitrust authorities focuses on the dimensions of timeliness, likelihood, and sufficiency.

Entry barriers are either government-induced or the outgrowth of poorly functioning or poorly structured markets. Examples of barriers include sunk costs, excess capacity, large capital requirements, economies of scale, advertising, strategic pricing, product differentiation (including “brand loyalty”), regulations, and consumer inertia. An example of an extremely high entry barrier is a natural monopoly in which one company can serve the market at a lower cost than that achievable with two or more companies. Analysts and others commonly consider traditional utility distribution systems to be natural monopolies.

Economists often disagree on whether certain “barriers” are actually anticompetitive or merely normal, pro-competitive market activities. Critics of a broad definition of entry barriers contend that many of the alleged barriers are no more than market efficiencies that serve to improve consumer welfare. They are often mistaken for obstacles to competition that need to be mitigated. As an example, when motivated by competitive forces, discounts and other forms of discriminatory pricing can promote competition, rather than repress it. By definition, pro-competitive activities benefit both consumers and society at large. In contrast, anticompetitive activities such as predatory pricing violate social-welfare-enhancing market practices by making a firm or group of firms better off at the expense of consumers. (Under predatory pricing, a firm lowers its price below its marginal cost to drive rivals out of business and scare off potential entrants. The effect is higher prices to consumers in the long run.)

IV. The challenges for regulators

State public utility commissions have faced market power issues in evaluating merger and acquisition proposals and industry restructuring plans freeing utility industries from traditional, embedded cost-based regulation. Market power problems can arise, for example, from vertical leveraging and horizontal concentration of generation capacity. Vertical leveraging occurs when a utility or its parent company attempts to exploit its position in the regulated monopoly market to gain an unfair advantage for its affiliate.

Regulatory actions to reduce the probability of excessive market power must weigh the expected benefits and costs. Few would dispute this counsel. Precise and uncontested measurements of the benefits and costs are another matter; sharp disagreements exist among analysts and policymakers regarding the correct mitigation strategies. In the example of vertical disintegration—the breakup of a electric utility, for example, into separately controlled and owned generation, transmission, and distribution business entities—regulators would need to balance the benefits of reducing the likelihood of leveraging against the cost of lost economies of scope (i.e., the higher combined costs of generation, transmission, and distribution when produced by separated entities rather than a single vertically integrated utility). Quantifying the net benefits to consumers at a reasonable level of precision, however, presents a serious challenge to decisionmakers.

Regulators face the risk of taking a proactive stance against what they see as a serious market-power problem when none exists. Firms with high market shares and high profits might reflect their superiority in producing innovative products at low cost. The costs of any action would likely exceed the benefits. Regulators also risk taking no action when market power is harming utility customers.

Regulators will continue to find it difficult to detect and measure market power and know what to do when it exists. Antitrust authorities, after all, have dealt with these matters for decades with substantial resources, and they still find each case challenging, offering no easy answers. By familiarizing themselves with the basic concepts and ideas outlined in this paper, regulators increase the chances that they will make appropriate decisions on a complex issue.