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A REGULATORY PERSPECTIVE
ON DOMINANCE IN NETWORK MARKETS

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Executive Summary

This report addresses the emerging competitive questions associated with network industries that are moving from monopoly to competitive market structures. Firms with substantial market share can result from the current transition to competitive markets. These “dominant” firms by their nature have the potential to set prices at supra-competitive levels or engage in other activities that adversely affect competition. The incentives to engage in this conduct may be enhanced by the network structure of these markets. Industries with network effects will tend to be “sticky” since the costs to move may be high and the value of a new network may be initially small. The twin features of dominance and network effects in turn translate into a need for greater scrutiny of market activities. One of the interesting outcomes is the greater credibility network effects may have on claims of predation. At the same time it may also provide a market defense for predation claims since consumer value may be derived from increased networking of those customers.

Potential problems in these transition markets may be mitigated by appropriate regulatory action. Fair interconnection standards may be the most critical thing that commissions can provide to the process. Additionally, they may need to structure proceedings for quick response to predation claims. Moreover, commissions may want to strengthen their abilities to address pricing, costing, and subsidization issues that traditionally have been within the purview of antitrust authorities.

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Introduction

The introduction of competition to traditionally regulated markets of monopolies presents regulators with a wide range of problems. In telecommunications and energy markets, much of the focus has been on those strategies that permit the competitors to connect to the legacy transmission systems so that competition can begin. Less effort has been focused on the competitive processes once interconnection is completed.

It is reasonable to believe that markets in these industries will initially be characterized by a dominant-fringe market structure. The incumbent sellers will initially retain large market shares with a fringe attempting to shave away the incumbent's customers. Traditional economic literature suggests that the smaller players will be price takers and face some significant challenges in entering these markets.

The entry will be further complicated by the nature of the markets being challenged. Particularly in telecommunications, the network itself presents some interesting questions for a challenger. Many of those problems have been mitigated by the legal requirements of interconnection, but networks exhibit some strong effects that provide incentives for parties to undertake anti-competitive behavior.

In particular, the likelihood of predation in these transitional markets with strong network characteristics presents some especially interesting problems. While predation as an approach to securing market

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share and power is often downplayed by academics and industry players, the credibility of the approach nonetheless seems much more robust in regulated markets than in others.

As part of their ongoing mission, regulators may need to be particularly sensitive to claims of predation. As monopoly markets are challenged, dominant firms may seek to take advantage of network effects to sustain their dominance. If this premise is accepted, it warrants continuing monitoring and enforcement activities on the part of regulators to better assure that the efforts to provide interconnection are not frustrated by other behavior.

This report draws together three related themes from law and economics. The report first looks at the static and strategic models of the dominant firm. This basic economic model is key to the discussion of future regulation since the transitional structure is likely to be defined by incumbents holding large market share challenged by fringe new competition. The section that follows outlines a further complication in the dominant firm analysis caused by the network effects associated with communications industries. These network effects create additional incentives to tip markets and lock in the resulting control that the tip provides. Drawing these two themes together, the third section addresses one of the important antitrust issues that may emerge in network industries: predation. Predation is normally difficult to assert in traditional markets, but in regulated network markets where a dominant firm structure already exists, the basic elements of predation become more plausible. The section concludes by suggesting some models for

assessing predatory behavior. The last section then provides some general comments and suggestions for commission action as markets migrate toward greater competition.

There are limits to this analysis. Though the basic drivers addressed are hardly novel, how they play out is far from clear. Thus, this piece attempts to connect some ideas generally, but avoids any grand conclusions about the nature of the regulatory mission or the likelihood that certain actions will mature. In that sense, this analysis attempts to initiate and extend current discussion.

**Strategic Behavior of the Dominant Firm:
Static and Dynamic Economic Models**

The dominant firm, i.e., one that retains a substantial portion of the market for a product, is an odd beast. Although it faces more constraints from the market place than a monopoly, it nonetheless is a price setter for the fringe competitors. Moreover, time plays an important role: choices at one point in time affect future outcomes in important ways. Dominant firms thus present important regulatory issues that resemble those presented by a monopoly, but add some new wrinkles as well.

The Static Model of the Dominant Firm

A dominant firm is one that can exercise market power without the assistance of other firms.¹ No particular measure of market share is commonly accepted as determining dominance.² Nor is the ability or desire to crush competition determinative.

Single-firm dominance occurs “where there is a probability that the other enterprises in the market will act in a way calculated not to affect adversely the dominant concern’s short-term interest.” In other words, a dominant firm’s rivals will behave more or less noncompetitively. Their motive for this need not be a trembling fear that they would otherwise be crushed (although that could be true of really strong dominance). Rather, the cooperation could be motivated by a recognition among the smaller rivals that following the dominant firm’s leadership would best serve their own profit interests.³

¹ “A dominant firm is one that is able to exercise, acquire, and maintain substantial market power unilaterally, without the need for group collusive agreements, either tacit or explicit.” Douglas F. Greer, *Industrial Organization and Public Policy* 301 (3d ed. 1992).

² Greer notes a range in the economics literature of 30 to 60 percent market share as indicating dominance. *Id.* For example, see Alice White, *The Dominant Firm Structure: Theoretical or Empirical Reality?* 48 *S. Econ. J.* 427 (1981) (using 50%).

³ Greer, *supra* note 2, at 302.

Dominance is reflected in market power; market power is evidenced by the ability to affect price and output.

A static model of the dominant firm and its ability to shape prices is captured in the kinked (or residual) demand curve of the dominant firm. The amount that the dominant firm will provide is determined by the supply available from fringe firms at various prices determined by the dominant firm. The dominant firm will set its output so that the marginal revenue it recovers from these sales will equal its marginal costs. (One additional sale will cost more to produce than what is recovered and thus reduce income; similarly, one less sale also will reduce income.) This price will be higher than the competitive price but lower than the monopoly one.⁴ “Hence, the competitive fringe of small firms leaves the dominant firm with less market power than a pure monopolist would have, but the dominant firm still has considerable power to exploit.”⁵

The last point is important: The dominant firm is constrained by the existence of fringe competition, but still retains market power. In contrast to the monopolist, the dominant firm is constrained to set its price no higher than the price that would permit the fringe to provide all of the supply demanded by the market. At the same time, a fringe firm survives

⁴ For the explanation of the kinked demand curve, see *id.* at 315-17, Dennis W. Carlton and Jeffrey M. Perloff, *Modern Industrial Organization* 157-69 (2d ed. 1994), and Edwin R. Rosenberg and Michael Clements, *Evolving Market Structure, Conduct, and Policy in Local Telecommunications* 19-26 (NRRRI: Feb. 2000).

⁵ Greer, *supra* note 1, at 316.

only as long as the dominant firm sells at a price greater than the marginal cost of production of that fringe firm. “The dominant firm sets a lower price because its demand is weaker as a result of the fringe. Furthermore, it takes into account how the fringe will respond to its price. Knowing that fringe supply is increasing in its price, the dominant firm sets a lower price in order to reduce fringe supply.”⁶ Thus, in the static market model, the dominant firm is constrained from charging a monopoly price, but nonetheless can control the size of the market for the competitive fringe.

The Dynamic Model of the Dominant Firm

In the longer term, the dominant firm must attempt to find the right balance of price to assure its continuing control. Simply put, if the dominant firm maintains too high a price for too long, it will encourage the entry of additional fringe supply. Thus, the dominant firm must make decisions about the short and long term profitability it wants to attain.

To maintain its profitability, the dominant firm must take care not to encourage too much additional entry on the part of fringe firms. Too high a price set by the dominant firm does just that. As long as the price the dominant firm sets is above the marginal cost of the fringe firm for the product, the fringe firm will invest in additional production. That

⁶ W. Kip Viscusi, John M. Vernon, and Joseph E. Harrington, Jr., *Economics of Regulation and Antitrust* 166 (2d ed. 1998).

production will then limit the amount that the dominant firm can supply and lower its price.⁷

Over time, then, the dominant firm must select a path between two extremes. On the one hand, it can attempt to maximize returns in the near term and set its prices high. Eventually this strategy will fail and the firm will no longer be dominant as competitors steal its customers. Alternatively, it can set its prices at what it believes the competitors' cost is (i.e., a limit price) and thereby frustrate entry.⁸ This approach, however, forgoes all or substantially all economic profits in the short term. In practice, the solution is between the extremes.

The dominant firm's price path is determined by a crucial dynamic tradeoff. Setting a price closer to that which maximizes current profit raises current profit but reduces future profit, as it causes the fringe to expand at a faster rate. This causes the dominant firm's future demand curve to shift in at a faster rate. In order to slow down fringe expansion, the dominant firm prefers to charge a price below that which maximizes current profit.⁹

⁷ For a more technical explanation, see *id.* at 168.

⁸ Darius Gaskins, *Dynamic Limit Pricing: Optimal Pricing under Threat of Entry*, 3 *J. Econ. Theory* 306 (1971).

⁹ Viscusi, *supra* note 6, at 170.

This tradeoff thus leads to a series of pricing decisions to maintain profits.¹⁰ At least that is what the economic model suggests.

While there is some empirical evidence to support dominant firm pricing theory,¹¹ the stronger evidence appears to exist about nonprice behavior. Alice White in a classic study of the dominant firm, however, found evidence in one important regard to support the dynamic model of pricing suggested in this section. She noted that price started high and then dropped over time.¹² This result is exactly what is predicted by the dynamic pricing model.

Nonprice Behavior of Dominant Firms

In practice, however, price alone does not capture the full picture of the dominant firm. As White states the problem: “The essence of market power is that it places several variables at the disposal of the firm for strategic competitive behavior rather than price alone. Models of firm behavior based solely on pricing decisions cannot capture this effect and

¹⁰ *Id.* at 170-01. One interesting effect is that the price declines over time. High initial prices are possible since initial fringe expansion is relatively small. *Id.*

¹¹ Greer, *supra* note 1, at 317.

¹² Alice P. White, *The Dominant Firm: A Study in Market Power* 63-64 (1983). White notes that the evidence of this sort of pricing is somewhat weak and may be explained by the other nonprice behaviors that dominant firms can use to maintain their dominance. *Id.* at 64.

consequently do not predict very well.”¹³ A more robust view of the manner in which the dominant firm may act to maintain its dominance must consider factors other than price.

White concluded that pricing behavior in practice did not follow the models based on price leadership or limit pricing.¹⁴

Dominant firms do have significantly higher profit than other large firms. ... In terms of their price policy, however, dominant firms appear to follow neither the limit pricing model nor the price leadership model. They use price as a competitive device but only for short-run strategic moves. Non-price policies in the form of product changes, research and development, and diversification strategies are more common and more important in their long-run effect on competition.¹⁵

Care must be taken, therefore, to understand some of the other factors the dominant firm may undertake to assure its continuing market power.

To maintain a dominant position, companies must invest in competitive strategies,¹⁶ and some of these will entail attempts to increase rivals' costs. The laundry list of things a dominant firm might

¹³ Id. at 66.

¹⁴ Id. at 123.

¹⁵ Id.

¹⁶ Id. at 59.

attempt includes product proliferation, intensive advertising, patent preemption, limit pricing, creation of excess capacity, price discrimination, lease-only marketing, tie-in sales,¹⁷ minor product tinkering, and standards definition.¹⁸ To this might be added various forms of integration.¹⁹ A price squeeze, pricing an input a rival needs but over which the dominant firm has market power, is another means of skewing the competitive game.²⁰ Each of these acts in some way makes it more difficult for a competitor to secure a sale.

Regulatory Response to the Dominant Utility Firm

In a world of dominant and nondominant firms emerging from a formerly monopoly world, the regulator might attempt to constrain the market power of the dominant firm while leaving the nondominant firms

¹⁷ Dennis Carlton and Michael Walman, *The Strategic Use of Tying to Preserve and Create Market Power in Evolving Industries* (National Bur. Of Econ. Res. Working Paper Dec. 1998). White notes that it appears to be strategy among dominant firms, White, *supra* note 12, at 94, and concludes: "Marketing of components as a system is thus another way in which dominant firms can reinforce their market position through altering the nature of the product and its conditions of production." *Id.* at 119.

¹⁸ The list in the text is compiled from those of Greer, *supra* note 1, at 326 and White, *supra* note 12, at 104-19.

¹⁹ Greer, *supra* note 2, at 547; White, *supra* note 12, at 86.

²⁰ Greer, *supra* note 1, at 551.

to take what they can get. Essentially, the regulator would divide regulation between price setters, the dominant firm, and everyone else.

The FCC's approach to the interLATA market reflected an approach akin to this. Following the FCC's approval of interconnection with other carriers, the commission determined that it would not regulate carriers lacking market power and would suspend regulation of resellers from tariff regulation.²¹ Known as the *Competitive Common Carrier* cases, the FCC's decisions attempted to determine the kind of regulation necessary in a market filled with several very large companies and many new entrants.

In the first decision, the commission divided the telecommunications world into dominant and nondominant carriers. Dominant carriers are those that could exert market power in such a way as to extract supracompetitive profits and defeat entry by predatory pricing.²² Those without that ability were deemed nondominant carriers.²³ To determine dominance, the commission suggested that several factors were relevant, but placed special emphasis on the existence of bottleneck control of essential facilities. Under this definition of dominance, companies that leased lines from dominant carriers for resale to end users, generally known as resellers, were not dominant.

²¹ First Report and Order, Policy and Rules Concerning Rates for Competitive Common Carrier Services and Facilities, 85 F.C.C.2d 1 (1980).

²² *Id.* at 20-21.

²³ *Id.* at 21.

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The Commission perceived that there were low barriers to entry and exit and no ability to raise or lower prices from competitive levels by these companies.²⁴

The difference between dominant and nondominant carriers then drove the relative level of regulation. Regulation for dominant carriers remained unchanged. They would still be subject to tariffing, entry, and exit requirements.²⁵ For nondominant carriers, the FCC lowered the degree of regulation. It eliminated the requirement for cost information to support tariff filings of nondominant carriers on the belief that the cost of filing outweighed the benefits to the customer. The Commission shortened the notice periods for tariff changes to permit quicker response to the market. The Commission also revised the grounds for suspending tariffs to prevent the use of the regulatory process to impede competition. Finally, it revised the provisions for certification of carriers and expansion of service and eased the means for abandoning service by providing for a thirty day notice if other alternatives are available (which, by definition, there must be if the service was competitive).²⁶

²⁴ *Id.* at 29.

²⁵ *Id.* at 3-4 & 30.

²⁶ *Id.* at 33-49. When the Commission attempted to take the final step by mandating that nondominant carriers not file tariffs, the court of appeals found that was not permitted by statute. Sixth Report, Policy and Rules Concerning Rates for Competitive Common Carrier Services and Facilities Authorization Therefor, 99 F.C.C.2d 1020, rev'd sub nom., *MCI Corp. v. FCC*, 765 F.2d 1186 (D.C. Cir. 1985).

Although the measure used to determine dominance (control of bottleneck facilities) was a little unusual, the asymmetric regulation has a straight-forward logic to it. It is used to constrain pricing behavior and assuage public interest concerns raised by entry and exit by a carrier facing little competition.

Such regulation, however, is not costless. There may be a practical limit to the success of such an approach. For example, the pricing information the dominant carrier is required to file may serve to “fix” prices, thus creating the price leadership problem. Alternatively, the regulator might set pricing rules for the dominant firm to prevent it from charging the higher price it would otherwise extract by setting price at cost. If cost is below the level the residual demand curve might allow, the effect of such an action is to lower price to cost and thereby shrink the fringe. If anything, the costing approach may have exactly the opposite of the desired effect: regulating at cost in this mixed market might serve as a form of limit pricing.²⁷ Thus, the asymmetric approach presents some curiosities that need to be carefully considered.

The dominant-fringe structure also presents some strong incentives for the dominant firm to retain its dominance. As noted previously, price and nonprice behavior can be directed at the maintenance of the dominant relationship because it can generate excess returns. Some of

²⁷ See Jaison R. Abel, *Pricing and Competition in Local Telephone Markets under Price-Cap Regulation*, Unpublished Dissertation, Ohio State University (1999). Abel argues that the adoption of tightly binding price-cap regulation for a dominant firm can produce an outcome similar to a limit pricing strategy with the added credibility of a state sanction.

this incentive may be channeled into customer-enhancing activities, but the theory also suggests that less beneficial activities may also take place. From the point of view of regulators, the incentives created by this market structure may warrant on-going regulatory involvement in the market operations through enforcement and monitoring.²⁸

The network itself adds an additional wrinkle. Networks gain value for their customers from adding players. Thus, they create some additional incentives and challenges to firms to seek and retain dominant market positions. The next section addresses some of the curiosities and how they reinforce the incentives to sustain dominance.

Network Effects

Basics of Networks

The concept of network effects is something of a darling to lawyers working in transitional industries.²⁹ Because the economic arguments have some significant implications, that interest is probably understand-

²⁸ Robert E. Burns et al., *Market Analysis of Public Utilities: The Now and Future Role of State Commissions* (1999).

²⁹ Mark A. Lemley and David McGowan, *Legal Implications of Network Economic Effects*, 86 *Calif. L. Rev.* 479 (1998) (noting the variety of contexts ranging from antitrust to contract law in which network effects arguments have been advanced).

able. Particularly in true networks such as telecommunications, the network effects literature raises some important issues for regulators as they address the concerns of incumbents and new entrants.

As used in the economic literature, physical networks and network effects are different concepts. "Formally, networks are composed of links that connect nodes."³⁰ A network consists of many components that are complementary.³¹ Compatibility of components is what makes the network functional. "[F]or many complex products, actual complementarity can be achieved only through the adherence to specific technical compatibility standards. Thus, many providers of network or vertically related goods have the option of making their products partially or fully incompatible with components produced by other firms."³² One conclusion to be drawn from this notion of complementarity is that networks do not require one owner. The assumption of a single provider of a network is no longer central to the study of networks.³³ The market for the network, however, is defined by the products of different firms that can be used together.³⁴

³⁰ Nicholas Economides, *The Economics of Networks*, Address before the E.A.R.I.E. Conference (Sept. 1994).

³¹ *Id.*

³² *Id.*

³³ *Id.*

³⁴ "The central feature of the market that determines the scope of the relevant network is whether the products of different firms may be used together. For communications networks, the question is one of whether consumers using

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Network industries are premised on network effects. Network effects occur when the demand for a product is increased by the expectation that others will be using it.³⁵ The telephone system shows this sort of relationship. The market for telephones is positively related, up to some level, to the expectation that others have telephones. The current buyer derives value from the expectation that others will join the network.³⁶ More specifically:

Networks exhibit positive consumption and production externalities. A positive consumption externality (or network externality) signifies the fact that the value of a unit of the good increases with the number of units sold. To economists, this fact seems quite counterintuitive, since they all know that, except for potatoes in Irish famines, market demand slopes downward. Thus the earlier statement, “the value of a

one firm's facilities can contact consumers who subscribe to the services of the other firm.” Michael L. Katz and Carl Shapiro, *Network Externalities, Competition, and Compatibility*, 75 *American Econ. Rev.* 424, 424 (1985).

³⁵ Danial L. Rubinfeld, *Competition, Innovation, and Antitrust Enforcement in Dynamic Industries*, Address before the Software Publishers Association (Mar. 24, 1998) (<http://www.usdoj.gov/atr/public/speeches/1611.htm>).

³⁶ Technically, network effects and network externalities are distinct. “Externalities are inefficient external effects—social costs or benefits that result in inefficient production or nonoptimal distributions of welfare.” Lemley and McGowan, *supra* note 29, at 482 n.5, quoting Jules L. Coleman, *Markets, Morals and the Law* 76 (1988).

unit of a good increases with the number of units sold,” should be interpreted as “the value of a unit of a good increases with the expected number of units to be sold.” Thus, the demand slopes downward but shifts upward with increases in the number of units expected to be sold.³⁷

In network markets, history matters.³⁸ The effect occurs because of initial and expected patterns in the product’s distribution.

To the extent there are network externalities, those externalities will result in less than efficient distributions of resources, at least in theoretical economic terms. On the one hand, pure competition will not produce an optimal network.³⁹

In the presence of network externalities, it is evident that perfect competition is inefficient: The marginal social benefit of network expansion is larger than the benefit that accrues to a particular firm under perfect competition. Thus, perfect competition will provide a smaller network than is socially optimal, and for

³⁷ Nicholas Economides, *supra* note 30, at 6. See, also, Katz and Shapiro, *supra* note 34, at 424. Functionally, this value is derived through an interesting numeric effect: each additional customer adds $2n$ connections to the system. Economides, *supra* note 30, at 6-7.

³⁸ Economides, *supra* note 30, at 26.

³⁹ *Id.* at 10-11.

some relatively high marginal costs perfect competition will not provide the good while it is socially optimal to provide it.⁴⁰

Monopoly, however, does worse.⁴¹ “Influence over expectation drives the monopolist to higher production, but the monopolist’s profit-maximizing tendency towards restricted production is stronger and leads it to lower production levels than perfect competition.”⁴² Nonetheless, a single provider will more likely emerge if strong network effects occur since customers will tend to gravitate to the product based on compatibility with existing and expected other products from which they derive value. Taken together, these notions may suggest a case for intervention.

Characteristics of Network Economies: Tipping and Lock In

According to some economists, networks exhibit two important characteristics.⁴³ First, once a standard starts to predominate, the market “tips” in that direction, i.e., the standard dominates all others. Second,

⁴⁰ Id. at 11.

⁴¹ Id. at 11-12.

⁴² Id. at 11.

⁴³ Positive returns are not limited to network effects, but are more important to networks in general. Rubinfeld, *supra* note 35.

once the market has tipped, customers tend to be “locked in,” i.e., the standard is relatively difficult to displace. These characteristics have particularly important implications for competition.

Tipping

One important characteristic of network markets is tipping. Tipping is the movement of the market to one winner which dominates the market for the good or service.⁴⁴ In effect, the strong get stronger, but the weak tend to fail or fall to the margin.⁴⁵ The tipping is driven by customer perception of the expected size of the market of the various sellers. Since value is derived from being in the largest market, the expectation of value creates large winners (and losers).⁴⁶ “Positive feedback based on demand-side economics of scale, while more important now than in the past, is not entirely novel. Any communications network has this feature: the more people using the network, the more valuable it is to each of them.”⁴⁷

⁴⁴ For a demonstration of tipping in markets, see W. Brian Arthur, *Competing Technologies, Increasing Returns, and Lock-In by Historical Events*, 99 *Econ. J.* 116 (Mar. 1989)

⁴⁵ Carl Shapiro and Hal R. Varian: *Information Rules* 176 (1999).

⁴⁶ *Id.* at 177 & 181.

⁴⁷ *Id.* at 182.

Lock-In

Lock-in represents the longer term result of network effects. Once customers have migrated to a particular good or service that exhibits network effects, they are likely to stay with that service or provider. Again the effect is created by the expectation of value to be derived from the network. Staying with the existing successful model provides a greater expected value than moving to a newer, smaller network. This effect appears to hold unless there is a significant change in expectations or a dramatically improved product lures existing customers.⁴⁸ Lock-in may also be enhanced by the high cost of changing products.⁴⁹ For example, there is a high cost to changing computer systems if software and training have to be replaced as well. These additional costs may prove to be too great a barrier for other competitors to overcome.

Significance of Tipping and Lock-In

The importance of tipping and lock-in is self-evident. If the market tips in a seller's favor, it gains significant market share and presumably

⁴⁸ There has been a curious debate in the academic literature about the likelihood of the market locking into an inferior product (e.g., the QWERTY keyboard). This report is not concerned at this point with the adoption of an inefficient outcome; it addresses the nature of the competition to reach that outcome. For part of the debate, see S.J. Liebowitz and Stephen E. Margolis, *Network Externality: An Uncommon Tragedy*, 8 *J. Econ. Persp.* 133, 146-48 (Spring 1994).

⁴⁹ Joseph Reagle, *Eskimo Snow and Scottish Rain: Legal Considerations of Schema Design* (found at <http://cyber.law.harvard.edu/people/reagle/md-policy-design-19990206.html>) (fax machines represent a fixed cost).

market power. Once tipped the market will be locked in, thus sustaining the market power. "[I]f consumers expect a seller to be dominant, then consumers will be willing to pay more for the firm's product, and it will, in fact, be dominant."⁵⁰ For the successful seller, it is the best of all worlds. The product is dominant and the dominance carries its own barrier to entry. Thus, sellers have every incentive to try to create a tip and then lock in that tip.

Competitive Behavior in Networks

The benefits of network effects to a successful seller give it some strong incentives to urge the market to tip and then to attempt to lock in that market if it successfully tips.⁵¹ The goal is to create a "bandwagon effect" that starts the tip.⁵² The attempt to tip may have either price or nonprice components.

⁵⁰ Katz and Shapiro, *supra* note 34, at 425.

⁵¹ While outside the scope of this discussion, an interesting application of some of the basic concerns set out in this section are suggested by the initial findings in the Microsoft antitrust trial. In the findings, the judge identified several "network" issues in support of his decision that Microsoft was a monopoly that abused its power. *United States v. Microsoft Corp.*, Civil Action No. 98-1232 (TPJ), 1999 U.S. Dist. LEXIS 20897, (D.D.C. Dec. 20, 1999).

⁵² Michael L. Katz and Carl Shapiro, *Systems Competition and Network Effects*, 8 *J. Econ. Persp.* 93 (Spring 1994).

Price behavior is one way of securing customers. Penetration pricing in particular makes sense in these kinds of markets since the seller seeks to encourage some core level of use to create an expectation that the market will tip in its favor.⁵³ Whether that pricing is anticompetitive is left to the last section of this report.

Alternatively, there may be additional pressure placed on markets in the form of a price squeeze. To the extent that some part of the network is controlled by one party, that party may seek to exclude others from competing by pricing the sale of the part at an uncompetitive level. If the component price is set high enough, competition is excluded.⁵⁴

Apart from pricing, the party seeking to tip the market could attempt several nonprice activities to seek to move the market in its favor. Heavy use of advertising, for example, might seek to create a bandwagon effect.⁵⁵ The company seeking dominance may also increase attempts for product differentiation and incompatibility.⁵⁶

⁵³ *Id.* at 108; same: Rubinfeld, *supra* note 35.

⁵⁴ Rubinfeld, *supra* note 35. The squeeze may be better than actual foreclosure. Economides, *supra* note 30, at 24, citing N. Economides and G.A. Woroch, Benefits and Pitfalls of Network Interconnection, Discussion Paper No. EC-92-31, Stern School of Business, NYU (1992).

⁵⁵ Katz and Shapiro, *supra* note 52, at 107.

⁵⁶ *Id.* at 110-11; Rubinfeld, *supra* note 35; Carl Shapiro, Antitrust in Network Industries, Address before the American Law Institute and American Bar Association (Mar. 7, 1996). The decision in the Microsoft case suggests some of these concerns. *United States v. Microsoft Corp.*, Civil Action No. 98-1232 (TPJ), 1999 U.S. Dist. LEXIS 20897 (D.D.C. Dec. 20, 1999).

Of more concern are practices that seek to prevent competition altogether. Tipping, for example, encourages foreclosure.⁵⁷ “Wherever price exceeds the marginal cost of using a link in the network, each firm will have an incentive to try to obtain traffic ... over its network to gain revenue, regardless of whether the result is inefficient overall routing.”⁵⁸

Also of interest are practices that work to mislead the market about the nature of the network. Vaporware is a classic example. In the software industry, companies may make announcements about coming versions of existing software to discourage migration to a competing product.⁵⁹ The rationale for this practice is not apparent unless network effects are accounted for. On the one hand, the company announcing the expected release will incur significant ill will when the product is not released on time or at all. On the other hand, buyers may forestall switching to a competing product based on the expectation that the product will be released.⁶⁰ Disparagement of a competitor’s product might also be used to similar effect.⁶¹ The similarity between

⁵⁷ Rubinfeld, *supra* note 35.

⁵⁸ Dennis W. Carlton and J. Mark Klammer, *The Need for Coordination among Firms, with Special Reference to Network Industries*, 50 U. Chi. L. Rev. 446, 452 (1983).

⁵⁹ The practice is sufficiently common that surveys seek out the best examples of vaporware. See Vaporware ‘99: The Winners (<http://www.wired.com/news/technology/0,1282,33142,00.html>, sited visited Jan. 3, 2000).

⁶⁰ Rubinfeld, *supra* note 35; Shapiro, *supra* note 56.

⁶¹ Shapiro, *supra* note 56.

anticompetitive activities in networks thus bears a striking resemblance to those that are suggested by the dominant firm analysis discussed above.

Regulated Communications Markets

In communications markets, one must look at network effects with a certain amount of the story already in place. Communications markets until recently have been defined by their regulatory monopolies. Beginning at the start of the twentieth century, government operated complex regulatory systems that assured the dominant carrier a monopoly over various parts of the system. As the monopoly shrank, first in long distance and customer premises equipment and then in local telecommunications, a dominant carrier could be expected to protect its network advantages. Further, the question was not whether a network would be created, but rather whether the monopoly could be parceled among competing carriers. The nature of the debate, however, remains one about network effects even though the starting points for competitive discussion were different than for other recent developments such as those in the software industry.

Once the market is dominated by one seller, the dominant firm will seek to retain its dominance and with it its market power. The most effective way of doing this is by frustrating interconnection. "[F]irms with good reputations or large existing networks will tend to be against

compatibility, even when welfare is increased by the move to compatibility. In contrast firms with small networks or weak reputation will tend to favor product compatibility, even in some cases where the social costs of compatibility outweigh the benefits."⁶² While some of the battle over standards still is being played out in telecommunications markets, interconnection requirements and standards in the local, long distance, and equipment segments have largely negated that issue.

Instead, the rules for deregulating the telecommunications markets have largely focused the players on competing within standards. This competition is most obvious in the customer premises equipment market. Standards for attaching equipment to the network are generally given, especially those laid out by the FCC. Thus, the competitors largely compete on features and price. They compete within the standards of the network.

Local competition is moving in a similar direction. Once the process of interconnection is completed,⁶³ the parties do not compete on the size

⁶² Katz and Shapiro, *supra* note 34, at 425. For a discussion of competition within and outside the standards of a network, see Stanley M. Besen and Joseph Farrell, *Choosing How to Compete: Strategies and Tactics in Standardization*, 8 *J. Econ. Perspectives* 117 (Spring 1994).

⁶³ The FCC's decision on Bell Atlantic's application to provide long distance service is an example of this process of determining whether competitors will be able to interconnect in a competitively neutral manner. In *re* Application by Bell Atlantic New York for Authorization Under Section 271(f) the Communications Act to Provide In-region, InterLATA Service in the State of New York, Memorandum Opinion and Order, FCC 94-404 (Dec. 22, 1999). Once interconnection is possible, the parties compete within the standard.

and value of the relative networks since all players are connected to the same network. Instead the competition focuses on the price and services offered by the individual competitor. The real battle thus is within the standard. Price and features become the key factors to maintaining relative strength.⁶⁴

Caveats to the Network Effects Story

Theory begets counter-theory,⁶⁵ and network effects arguments are well-debated in the academic literature.⁶⁶ Some have noted that much of the argument in support of network effects looks very similar to traditional natural monopoly questions.⁶⁷ Another standard challenge is

⁶⁴ Varian and Shapiro, *supra* note 45, at 231.

⁶⁵ For a related discussion in the area of digital media, see Peter Lunenfeld, *Screen Grabs: The Digital Dialectic and New Media Theory*, *The Digital Dialectic* xiv (Peter Lunenfeld, ed. 1999).

⁶⁶ See, e.g., Stan J. Liebowitz and Stephen E. Margolis, *Causes and Consequences of Market Leadership in Application Software*, Paper presented at the conference, *Competition and Innovation in the Personal Computer Industry* (Apr. 24, 1999).

⁶⁷ William Kolasky, *Network Effects: A Contrarian View*, 7 *Geo. Mason L. Rev.* 577 (1999).

to the “stickiness” of tipping.⁶⁸ One author, for example, has noted that technological adapters and differences in taste will frustrate “stickiness.”⁶⁹ There is also a significant amount written to the effect that markets do not fail to produce the better product (for example, the QWERTY debate).⁷⁰

Despite these concerns, it is fair to say that economists agree on the notion of positive feedback in traditional network markets such as communications. The role of externalities is clear in these markets and has been for a long time. Given the importance of network effects, it follows that companies will try to position themselves in such a way as to enhance their own position, presumably at the expense of others. To the extent that markets are sticky and tend to tip to a single winner, the importance of networks remains high.

⁶⁸ Liebowitz and Margolis, *supra* note 48, at 145 (“A clear implication of the network externalities literature is that often we cannot move from one technology to a superior one, from one standard to a better one, from one kind of network to a better one.”).

⁶⁹ Kolasky, *supra* note 67, at 589-90.

⁷⁰ Liebowitz and Margolis, *supra* note 48, at 145 (Qwerty and Betamax stories challenged). As noted previously, this debate is not within the scope of this report. The gist of the debate, however, revolves around the implication of network effects to lead to the success of less superior quality products. The success of VHS over Betamax is often a focus of this debate.

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In markets already dominated by a single vendor as a result of the prior regulatory regime the challenge could have developed along two fronts. Absent interconnection requirements, the parties could have competed on standards. The legal changes, however, required competition within standards. Because the parties are competing within the standard, the focus is on pricing and features. Up to this point, the story would not appear to be unique. In networks, however, failure can be more dramatic. Failure to win could lead to a death spiral as other players replace the incumbent network player. Thus, there is additional encouragement to be aggressive to sustain market share; the alternative is a higher potential of failure.

Not only is the incentive stronger, but dominance in a network market would appear to carry the additional benefit of stickiness. As previously noted, the dominant firm has an incentive to secure its existing market power. To the extent that it can price effectively to prevent market share from shifting to other players, it seems likely to do so. In network markets, moreover, this incentive is enhanced. Given the expectations of customers that they derive value from being with the biggest network and the barrier to entry associated with name recognition and incumbency, the market could be expected to be sticky. The situation is thus ripe for practices that in other competitive markets would appear less likely. Among these, predation may be a logical response for the incumbent in a transitional telecommunications market.

Regulation of Strategic Behavior Through Antitrust-Like Models and Predation

The Predation Problem

There is some intuitive appeal to the notion that a large firm might use its ability to manipulate competition. This “bully” theory’s appeal rests on the expectation that the large company will use whatever means are available to continue its dominance.⁷¹ Intuition is reinforced by the understanding that the dominant firm will be able to set the price that the fringe firm can expect. It is further enhanced by the motivation in network markets that tipped markets tend to move to dominance and stay that way through lock-in. The dominant firm thus has an incentive to drive the competitors into the ground through predatory tactics.

Every intuition has its limits. The limit with predation is the likelihood of success.⁷² If the practice is predatory in the traditional sense, the

⁷¹ This “bully” theory is drawn from one of the “unsophisticated” theories critiqued by Judge Bork. Robert H. Bork, *The Antitrust Paradox: A Policy at War with Itself* 144 (1978).

⁷² Bork states the problem of likelihood of success:
Any realistic theory of predation recognizes that the predator as well as his victims will incur losses during the fighting, but such a theory supposes it may be a rational calculation for the predator to view the losses as an investment in future monopoly profits (where rivals are to be killed) or in future undisturbed profits (where rivals are to be disciplined). The future flow of

predator must be incurring short term losses with the expectation of recoupment in a later period. In short, the longer term self interest of the predator must outweigh the shorter term interest in current returns. If losses could be anticipated in the short term that could not be expected to be recouped in the longer term because re-entry is simple, then predation is not reasonable. Instead it is just bad judgment that leads to lower prices in the present term and no expectation of recoupment in the longer term. Under a consumer-oriented test of predation, lower prices cannot be bad.

Saying that predation is unlikely, however, is not the same as saying it will not occur.⁷³ The question is whether there is an explanation for certain kinds of behavior when predatory practices are apparent. The test then is to determine whether under particular circumstances such practices are competition in full bloom, bad judgment, or competition-threatening. The starting point for such a discussion is the current legal

profits, appropriately discounted, must then exceed the present size of the losses. So stated, there seems nothing inherently impossible in the theory. The issue is the probability of the occurrence of predation and the means of detecting it.

Id. at 145.

⁷³ For example, Richard Posner has suggested it is wrong to conclude that predation is an irrational practice, using an analysis that is much more sensitive to the complexities of markets. Richard A. Posner, *Antitrust Law: An Economic Perspective* 185-86 (1976). Judge Bork finds price predation extremely unlikely, but notes that other forms of predation such as abuse of process should be given greater regard. Bork, *supra* note 71, at 159-60.

structure under antitrust law which attempts to identify the circumstances in which predation can occur. To this can be added a review of alternative circumstances and rationales for price cutting that might be predatory. From this discussion emerges a model for assessing a claim of predation that seeks to account for its likelihood and that begins to tie together the concerns raised by dominance and network effects.

Requirements for a Finding of Predation under Antitrust Law

The Supreme Court in *Brooke Group Ltd. v. Brown and Williamson Tobacco Corp.*⁷⁴ defined the current law of predatory pricing. In that case, Liggett (subsequently the Brook Group) attempted to demonstrate that Brown and Williamson sought to discipline it through predatory pricing in the generic cigarette market. After a jury decision in favor of Liggett, a court of appeals and the United States Supreme Court held for Brown and Williamson, and the Supreme Court in its decision set out a two-part test for finding predatory pricing.

Relying on the criticism that predatory pricing is usually economically irrational, the Court initially limited the liability to those instances in which price was set below some undefined level of cost. The Court stated, “[A] plaintiff seeking to establish competitive injury resulting from a rival’s low prices must prove that the prices complained

⁷⁴ 509 U.S. 209 (1993).

of are below an appropriate measure of its rival's costs."⁷⁵ In a footnote, however, the Court declined to decide what that appropriate level was.⁷⁶

The rationale for this approach was straightforward:

As a general rule, the exclusionary effect of prices above a relevant measure of cost either reflects the lower cost structure of the alleged predator, and so represents competition on the merits, or is beyond the practical ability of a judicial tribunal to control without courting intolerable risks of chilling legitimate price cutting.⁷⁷

Thus, the Court adopted a somewhat confined definition of what constitutes price predation.

The Court further defined the offense with a requirement that the plaintiff demonstrate that the defendant could expect to recoup its losses through above-market pricing. "The second prerequisite to holding a competitor liable under the antitrust laws for charging low prices is a demonstration that the competitor had a reasonable prospect, or, under §2 of the Sherman Act, a dangerous probability, of recouping its investment in below-cost prices."⁷⁸ Inherent in the element of

⁷⁵ *Id.* at 222.

⁷⁶ *Id.* at 222 n.1.

⁷⁷ *Id.* at 223.

⁷⁸ *Id.* at 224.

recoupment were two factors. First, the plaintiff must demonstrate that the predation will have the intended effect on rivals. To show this, the plaintiff would have to demonstrate the extent and duration of the predation, the relative financial strength of the predator, and the parties' respective incentives and will.⁷⁹ In essence, the rival must be expected to react. Second, the market must be structured to permit continued supra-competitive pricing once the rival has succumbed. As the Court explained, "In certain situations—for example, where the market is highly diffuse and competitive, or where new entry is easy, or the defendant lacks adequate excess capacity to absorb the market shares of his rivals and cannot quickly create or purchase new capacity—summary disposition of the case is appropriate."⁸⁰

As noted above, the Court's intent was to make the hurdles high for a predatory pricing case. The Court assumed that true cases were rare and usually unsuccessful.⁸¹ Moreover, the Court set the standards to avoid an unwarranted finding of predation that would prevent lower consumer prices. In its statement of the relevant law, the Court concluded, "It would be ironic indeed if the standards for predatory

⁷⁹ *Id.* at 225.

⁸⁰ *Id.* at 226.

⁸¹ *Id.*

pricing liability were so low that antitrust suits themselves became a tool for keeping prices high.”⁸²

In regulated and transitional markets, however, there are both static and strategic approaches that make predation both possible and profitable. While the same policy reasons expressed by the Court in *Brooke* warrant caution, that story is not complete. First, the ability to execute a successful predatory approach by a dominant firm is more likely in regulated or transitional markets. Second, a large firm under appropriate circumstances may adopt strategic approaches to predation. The legal tests must be sensitive to these possibilities as well.

Static Model of Predation

Since McGee’s classic article concerning predatory pricing,⁸³ both the courts and scholars have generally concluded that it is not likely absent extraordinary circumstances. The general argument is that price predation only works if the predator is successful in preventing

⁸² *Id.* at 226-27. If the Court intended to make predation cases difficult to sustain, it is fair to say that it has succeeded. “As interpreted by the lower courts, the *Brooke* decision had a powerful effect on case outcomes. In the six years following *Brooke* plaintiffs have not prevailed in a single case.” Patrick Bolton, Joseph F. Brodley, and Michael H. Riordan, *Predatory Pricing: Strategic Theory and Legal Policy*, Working Paper at 13 (1999).

⁸³ John S. McGee, *Predatory Price Cutting: The Standard Oil (N.J.) Case*, 1 *J.L. & Econ.* 137 (1958).

competitive reentry. Reentry absent special circumstances is difficult to prevent. Therefore, the argument concludes that predation is unlikely to occur.

Those following the static model, however, also recognize that one of those special circumstances occurs when a regulated company is operating in two markets, one regulated and the other competitive. In the static model, the utility uses its regulated subsidiary to “subsidize” its unregulated activities. As James Meeks explains in a recent article:

While under regulation the firm would normally be prevented from extracting the full monopoly rent from [the regulated market], it may be possible to subsidize the predatory foray in [the competitive market] out of higher prices in [the regulated market] if it can load more of the costs onto the regulated prices charged in [the regulated market]. It could then capture some of the monopoly rent that it otherwise would be unable to take in [the regulated market] due to the regulation. The firm would benefit from merely capturing the business in [the competitive market] at no increase in price. Thus, the competitive foray, rather than being an investment to be recouped in the future, is subsidized by loading some of the costs, which another firm would face, in the pricing of the regulated market product, where the price by definition was lower than its optimal level

for the firm but for regulation. By combining the two markets in this way, the firm can maximize profits.⁸⁴

For this strategy to work, there is one important condition: the firm must be able to hide its costs from the regulator.⁸⁵ Of course, as regulators know all too well, utility markets are filled with common and joint costs, the very allocation of which is extremely difficult. Thus, the ability to shift costs from the competitive to the regulated activities is a real concern.⁸⁶

To some extent this problem will be mitigated in modern telecommunications markets by the introduction of incentive regulation and in particular price caps. For those states that have not taken this action, the classic pricing and cost assignment problems remain. For those that have adopted price cap regulation for telecommunications companies, there remain concerns as companies return for renewals and in the definition of services subject to various tiers within the price cap (competitive versus noncompetitive services). The improper assignment of a monopoly service to a competitive sector could permit the same effects as in the improper assignment of cost in a traditional

⁸⁴ James E. Meeks, *Predatory Behavior as an Exclusionary Device in the Emerging Telecommunications Industry*, 33 *Wake Forest L. Rev.* 125, 133 (1998). For a similar discussion, see Timothy J. Brennan, *Is the Theory Behind U.S. v. AT&T Applicable Today*, 40 *Antitrust Bull.* 455 (1995).

⁸⁵ Meeks, *supra* note 84, at 133.

⁸⁶ Section 103 of the Telecommunications Act of 1996 draws out this concern explicitly in requirements that prohibit financial support for the competitive telecommunications affiliate of an energy holding company.

rate-of-return situation. The monopoly product could be overpriced in the noncompetitive sector to support competitive activities.

Strategic Model of Predation

The static model, moreover, is not necessarily the end of the analysis. Firms do not exist in a one-period universe. Rather they interact with other firms and other actors. When the market is viewed through a wider and longer lens, the logic of predation becomes more apparent than when seen through the static model.

Bolton, Brodley and Riordan offer several strategic approaches to predation.⁸⁷ The first attempts to dissuade competition by affecting investors in the competitor. “The predator seeks to manipulate that relationship and thereby drive the prey out of the market or deter its expansion into new markets.”⁸⁸ Predatory pricing serves to lower returns. Investors in turn are less likely to offer new or additional financing if the returns are expected to be low. The competing firm is thus excluded through the predatory practice.⁸⁹

⁸⁷ Bolton, Brodley, and Riordan, *supra* note 82.

⁸⁸ *Id.* at 28.

⁸⁹ Bolton, Brodley, and Riordan offer several scenarios:
A predator may slash price to drain the prey of sufficient funds to meet its loan commitments,

A second strategic explanation of predatory pricing is signaling. Signaling is an attempt to mislead the competitors concerning some critical aspect of the business.⁹⁰ “To the extent that an incumbent firm is better informed than others about cost or other market conditions, or can manipulate and distort market signals about profitability, it may be able to influence the expectations of its rivals through its pricing decisions or other actions.”⁹¹ Thus the asymmetry in information works in favor of the incumbent.

In reputation signaling, the predator lowers price in one market to demonstrate to others that it is a price cutter. By cutting prices and taking losses, the predator is indicating that it will go to great lengths to prevent competition. Thus, future entry is deterred. “By engaging in predatory pricing against current rivals the predator can acquire a reputation of being a ‘tough’ competitor—not irrationally tough, but tough in the sense

thereby forcing default. Less drastically, the predator may be able to lower the prey’s earnings and thus to impair [sic] the prey’s debt capacity by limiting the amount of collateral it can put up. In addition, reduced earnings exacerbate future agency problems by forcing the prey to pledge a bigger share of future profits to its’ [sic] outside investors and creditors.

Id. at 29.

⁹⁰ Id. at 38.

⁹¹ Id.

of projecting a perceived strategic advantage, for example lower costs, into other markets or time periods. ... [A]n existing rival and particularly a recent entrant, may be deterred from entering, and financiers discouraged from backing either existing or future rivals.”⁹²

A second strategy is demand signaling. In this approach, the predator lowers price to suggest to competitors that demand is weak in the affected market.⁹³ Bolton, Broadley, and Riordan suggest that two forms of this approach are plausible: test market and signal jamming. In test market signaling, the predator secretly cuts prices in the competitor’s new markets to reduce demand for the competitor’s goods or services. As a result of the weak response, the competitor gives up entry. In signal jamming, the predator openly cuts prices to distort the demand in the new market, and the new competitor is left with less reliable information to judge the market.⁹⁴ In either case, the predator gains a strategic advantage that will result in longer term benefits by excluding competition and retaining market power.

⁹² Id. at 39-40.

⁹³ Id. at 47.

⁹⁴ Id. at 47-48.

A Proof Model of Predation Based on Antitrust Analysis⁹⁵

As is apparent from the prior discussion, antitrust analysis does not lead to a simple model for a commission or other enforcement entity to use in assessing an alleged predatory price or practice. The Supreme Court in its balancing of the policy concerns of effective competition and enforcement has adopted a two-part test that suggests price and recoupment components. The former (outside the scope of this discussion) is inherently difficult to establish; the latter is a factually intensive determination. The latter, however, does consist of some basic considerations that can be set out in some detail and can be related to the basic static and strategic concerns outlined in the prior discussion.

For recoupment to be possible, there must be a market structure that will permit it to occur. This market will have a dominant firm (or small group of them acting in concert) that can exercise market power. It will also be marked by barriers to entry. In particular, high sunk costs are a potential problem.⁹⁶

Second, there must be a plausible scheme of predation. This scheme might be shown in the form of pricing practices and other

⁹⁵ The following discussion is loosely based on Bolton, Brodley and Riordan, *supra* note 82, at 16.

⁹⁶ *Id.* at 16-17.

behavior that demonstrates credible methods of predation such as signaling.⁹⁷

Third, there must be a showing of probable recoupment that injures competition. Rivals must be excluded or disciplined or they must demonstrate that the threat is real. This injury must translate into the expectation of higher prices or lower quality.⁹⁸

When these factors are combined with the prerequisite of below cost pricing, the demonstration of a predatory pricing case is complete. The only remaining question is whether the alleged predator has an excuse for the action. The excuse must demonstrate a legitimate business reason for the action that justifies the predatory action. For example, the dominant firm might be able to demonstrate that it is cutting prices to meet competition.⁹⁹ Once again, however, the burden is a factually intensive question for the decision maker.

The Role of Networks in the Analysis

Given the legal structure of predation, network effects would appear to be an important component of several of the basic questions

⁹⁷ Id. at 17-18.

⁹⁸ Id. at 18-20.

⁹⁹ Id. at 23.

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faced by regulators when addressing predation claims. It plays into not only the assertion of the claim, but also the defenses. The key, however, is that it is part of the factual analysis and not an answer in and of itself.

First, network effects arguably strengthen the story of dominance in a market. To the extent that a firm is dominant in a network market, network effects theory posits that the firm will stay dominant because the network effects operate as barriers to entry. Customers will incur additional costs in making a shift and thereby value new products less highly because of the loss of network benefits. Thus, the fringe competitors will face an additional burden or cost in inducing a customer to change if the network effects are strong.

Second, it strengthens plausible arguments for predation to occur. A dominant firm secures a special place in a network market. As a dominant firm, it can set the price based on the residual demand. It is equally plausible that it will seek to do what it can to sustain that position through appropriate signaling to demonstrate that it will discourage entry. Further, it will be in a stronger position to discriminate among customers,¹⁰⁰ thereby mitigating the losses that it might incur. This result differs from the usual situation that argues against the credibility of

¹⁰⁰ Shapiro and Varian, *supra* note 45, at 53-81.

predation in other contexts.¹⁰¹ If the losses are reduced the threshold for attempting predation is also lowered.¹⁰²

Finally, the motive to predate becomes clearer. In a network, the dominant firm has a distinct structural advantage if it maintains locked-in customers. The network effects carry some of that burden, but networks can also tip. Avoiding tipping by selective pricing—legal or otherwise— or other predatory actions can serve as a logical method of sustaining market share. What is good for the dominant firm is better for the network dominant firm.

Network effects also play a role in the defense of claims. Business justifications flow from the fact that customers will tend to gravitate to a particular product or successful network. They gain real value from the network, and this may translate into lower prices due to scale and scope improvements. Further, the standard defenses such as pricing to meet competition do not change because networks are involved. Thus, the network effects literature does not play to a single end.

While the preceding discussion has focused on pricing behavior, claims for other forms of predation may also be raised. Those activities

¹⁰¹ Judge Bork's critique of predatory pricing assumes that the same price is available to all buyers from the predator. Bork, *supra* note 71, at 149-55. The cost of predation declines as the ability to price discriminate becomes more available.

¹⁰² *Id.* at 159-60.

undertaken to impose additional costs on other parties may be just as troubling as pricing behavior (and some might argue more likely). These could include unwarranted use of the regulatory process, control of technical standards, product disparagement, and other actions that frustrate the competitive process. To the extent that they are part of a pricing case, they provide additional demonstrations of the predatory intentions or results. Alternatively, they may form their own basis for an unfair practices case based on predatory behavior.

The Changing Regulatory Mission

Dominant firm analysis and network effects theory suggest some basic reasons for concern in transitional markets such as telecommunications. During the transitional period, the dominant firms enter the fray with real market power. Network effects, particularly tipping and lock-in, add to the already significant concerns about that power. The combination may make for more credible situations where predatory behavior could occur. The problem will be in detecting that behavior in a way that does not discourage other competitive acts that provide consumer benefits.

As noted elsewhere, the transition to more competitive utility service entails changes to the regulatory structure. In one sense,

commissions will be encouraged to return to their roots¹⁰³ and provide the “informational infrastructure” necessary to its enforcement and regulatory activities.¹⁰⁴ This change will mean expanding the kinds of pricing and practice information that commissions collect.

Additionally, the enforcement model the commissions use also changes. Price and entry regulation takes on a different meaning when there are multiple vendors serving a particular territory. The traditional price and entry functions will likely diminish as greater emphasis is placed on enforcement. The abandonment of price and entry regulation, however, is not warranted when entry has not developed in significant amounts to balance existing market power. A balance must be struck in the face of limited resources.

In particular, the commissions will likely pay greater attention to market practices that otherwise frustrate the development of more competitive markets. In this role, commissions will need to develop analytical models that address factual questions more common in less regulated markets. That analysis will likely draw heavily on antitrust models.¹⁰⁵

¹⁰³ Thomas K. McCraw, *Prophets of Regulation* ch. 1 (1984) (noting the reliance of the Massachusetts Board of Railroad Commissioners under the leadership of Francis Adams to use information disclosure to direct policy).

¹⁰⁴ David W. Wirick, *New Models of Regulatory Commission Performance: The Diversity Imperative* 47 (1999).

¹⁰⁵ Burns et al., *supra* note 28.

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In making that analysis, regulators will have to decide complicated factual questions. These questions will arise in the context of pricing decisions and discrimination claims under various regulatory statutes. Antitrust models for assessing these questions can provide a useful device for sorting that information.

The role of price regulation in these mixed markets, however, presents a thornier question. To the extent that the price cap provides for more efficient pricing, customers gain. On the other hand, caps (and rate regulation in general) may provide for efficiency losses due to the suppression of competition through a form of limit pricing. Where to strike the long and short term balance will be a continuing problem for regulators.

That problem carries with it some important questions about the scope of the commission's role. In particular, commissions will need to develop expertise in pricing and costing as those develop in competitive markets. For example, the establishment of marginal pricing rules and an understanding of market elasticities will become significant to effective market monitoring. Likewise, there will be real opportunities for commission staff development of novel information on competition in the features associated with the networks. Commissions will also have opportunities to strengthen existing expertise in interconnection and intra-firm subsidization issues.

In summary, the dominant-fringe model and network effects add a significant dimension to the discussion of the transition in telecommunications and other utility markets. While competition is the goal, imperfections are introduced by the existence of market structures and

externalities that favor dominance. Dominance itself then carries with it results that will reduce customer welfare. Moreover, predation in particular becomes more likely. Commissions, therefore, will face important transitional questions that will require them to modify regulatory tools and develop new ones.