EXCLUSIVITY IN NETWORK INDUSTRIES

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INTRODUCTION

In the industrial economy, antitrust attention focused on industries subject to substantial scale economies. Economists and lawyers studied entry deterrence and tacit collusion in the steel and aluminum industries, various chemical industries, automobiles, oil, and so on. The focus was typically on the *supply side* of the market, because the supply side was where the production scale economies resided that made entry difficult and markets concentrated.

As the United States and world economy evolves from an industrial economy towards an "information economy," antitrust attention remains fixed on industries subject to substantial scale economies. The difference is that the scale economies now often arise on the *demand side* of the market. The essence of the "network economy" is that consumers place greater value on large networks than small ones. Such "network effects" clearly apply to *real networks*, such as networks of telephone users, compatible fax machines, or compatible modems. Perhaps less obviously, they also apply to *virtual networks*, such as the network of Apple Macintosh users, the network of users of Microsoft Excel, or the network of users of DVD machines. In industries ranging from computer software and hardware, to credit cards, ATM cards and smart cards, to telecommunications networks and the Internet itself, network effects are a critical part of the competitive landscape.[1] Sure, there are scale economies of writing an operating system, but these are minor in comparison with the network effects that currently work in favor of Microsoft.

It hardly follows that markets subject to network effects will inevitably be monopolized. Quite the contrary is true. More often that not, alliances form and the original developer of a new technology makes it "open" in order to gain acceptance and build an installed base. Although alliances and cooperative standard-setting present their own antitrust issues, these activities tend to be procompetitive, especially if the participants in the standard-setting process can freely compete with each other in

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[1] For an early analysis of network effects, see Jeffrey Rohlfs, *A Theory of Interdependent Demand for a Communications Service*, 5 BELL J. ECON. 16 (1974). For an accessible survey of the economics literature, see Michael Katz & Carl Shapiro, *Systems Competition and Network Effects*, 8 J. ECON. PERSP. 93 (1994).

the market while complying with the agreed-upon standards.[2] Indeed, many high-tech markets, such as those for personal computers and compact disk machines, are highly competitive, as companies vie for position selling standardized products.[3]

Yet pockets of market power, even monopoly power, remain when individual firms manage to maintain proprietary control over key product attributes or interfaces, usually based on copyright and patent protection. Of course, there need be nothing anticompetitive about such a result. In the absence of exclusionary behavior going beyond the enforcement of valid intellectual property rights, such market power is merely the proper reward to innovation, risk-taking, and business acumen.

But how is antitrust to react when such a dominant firm imposes restrictions on its trading partners (customers, suppliers, distributors, and/or complementors) that impede their ability to do business with a rival seeking to establish an alternative network to the one controlled by the dominant firm? I argue in this paper that such *exclusionary contracts* and *exclusive membership rules* can be especially pernicious in network industries, posing a danger that new and improved technologies will be unable to gain the critical mass necessary to truly threaten the current market leader. Ultimately, this is not a story about consumer harm based on monopoly pricing, although that can be part of the problem. The graver problem is that the pace of innovation may be slowed, denying consumers the full benefits of technological progress that a dynamically competitive market would offer.[4]

Section I of this article sets forth the economic logic leading to the conclusion that exclusive dealing in network industries can inhibit the emergence of superior technologies, and illustrates this logic with several examples.[5] Section II explains how exclusivity can cause greater harm to industry performance in network industries than in other settings. Section III describes the elements of a more formal economic model of exclusivity in network industries. Section IV contrasts an incumbent network's exclu-

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[2] For a fuller discussion of standard setting, see James Anton & Dennis Yao, *Standard-Setting Consortia, Antitrust, and High-Technology Industries*, 64 ANTITRUST L.J. 247, 247-65 (1995), Nicholas Economides & Lawrence J. White, *Netwarks and Compatibility: Implications for Antitrust*, 38 EUR. ECON. REV. 651 (1994) and Carl Shapiro, *Setting Compatibility Standards: Cooperation or Collusion?* (forthcoming 1999).

[3] For discussions of how standards fundamentally alter the nature of competition, see CARL SHAPIRO & HAL R. VARIAN, INFORMATION RULES: A STRATEGIC GUIDE TO THE NETWORK ECONOMY (1999), and Michael Katz & Carl Shapiro, *Antitrust in Software Markets* (forthcoming Progress & Freedom Found. 1999), *available at* <http://haas.berkeley.edu/~shapiro/software.pdf>.

[4] For a broad ranging discussing of network effects and the law see Mark Lemley & David McGowan, *Legal Implications of Network Economic Effects*, 86 CAL. L. REV. 479 (1998).

[5] David Balto argues along similar lines, and offers far more comprehensive coverage of various cases involving network industries. David Balto, *Networks and Exclusivity: Antitrust Analysis to Promote Network Competition*, 7 GEO. MASON L. REV. ___ (1999).

sive membership rules and exclusive dealing provisions with a simple refusal by the established network to interconnect with a new network.

I. HOW EXCLUSIVE DEALING CAN PREVENT AN ENTRANT FROM GAINING CRITICAL MASS: THE ECONOMIC LOGIC OF EXCLUSION IN NETWORK INDUSTRIES

Imagine a dominant firm with a large installed base of users in a market with strong network effects. Let me take as illustrative examples the network of users of the Nintendo Entertainment System ("NES") circa 1987, and the network of florists created by the Florist Telegraph Delivery Association ("FTD") during the 1950s.[6]

Introduce into this picture an upstart firm with a superior technology, but on that imposes "switching costs" on users—costs such as retraining people to use new software, converting data to a new format, or the installation of new capital equipment.

If the switching costs associated with the new technology, which we can also think of as *individual adoption costs*, are high, the so-called "superior technology" is not necessarily truly superior from an economic perspective. The economic logic here is much like that of a new energy-efficient refrigerator: it makes sense for consumers whose refrigerator has broken down (and consumers new to the market, i.e., those without a refrigerator) to buy the new type of refrigerator, but not so for consumers with well-functioning, older machines. Adoption costs create natural inertia, which is quite distinct from any artificial barrier to entry that the incumbent monopolist might attempt to erect.

Introducing network effects into this picture leads to even more natural inertia. Consumers in the market today must consider not only their individual switching or adoption costs, but also the possible loss of network benefits from picking an incompatible technology that is not yet popular. If network effects are strong, consumers will be very reluctant to pick a new, incompatible technology unless it offers dramatic improvements *and* they expect others soon to follow in their footsteps, thus creating critical mass for the new network. The new network will require time to grow, even in the absence of any anticompetitive conduct by the incumbent. Network industries thus exhibit natural *collective adoption costs* that exceed the sum of all the individual adoption costs.

I do not mean to suggest that these collective adoption costs make it impossible for new technologies to take root. To the contrary, we see new,

[6] I testified on behalf of Atari Corporation in their unsuccessful antitrust trial against Nintendo in 1992, *see* Atari Corp. v. Nintendo, (N.D. Cal. verdict May 1, 1992), and joined the Justice Department shortly after the DOJ entered into their 1995 consent decree with FTD. *See* United States v. FTD Corp., 60 Fed. Reg. 40,859 (1995) (proposed enforcement order); United States v. Florists' Telegraph Delivery Ass'n, 1956 Trade Cas. (CCH) ¶ 68,367 (E.D. Mich. 1956).

incompatible technologies displace older ones all the time: FTD's telegraph-based network displaced floral orders made over the telephone, Nintendo's NES triumphed over the original Atari system from the 1970s, CD players have displaced LP records, Qualcomm's CDMA technology has made significant inroads in the market for digital wireless telephones, and so on. The fact is, market participants are remarkably flexible and creative in creating institutions that overcome the "chicken and egg" problem inevitably faced by an emerging network. The question I address here is whether incumbent firms in network industries can, through the use of exclusivity, delay or frustrate the successful emergence of new technologies that threaten their dominance.

In the Nintendo example, consumers were reluctant to pick the Atari and Sega systems for several reasons. First, Nintendo did an excellent job of designing and marketing its system, and creating hit games that were available only on the NES. These pro-competitive moves allowed Nintendo to displace Atari as the industry leader during the 1985-86 time frame. Then, once Nintendo was ascendant, consumers (young boys for the most part) preferred Nintendo because they could share games and game experiences with their friends by using the same system, namely the NES. Also, game developers found it more attractive to write games to play on the Nintendo system because of the large installed base of Nintendo users.

So far, I have merely described the *natural* entry barriers in the market for video game systems. But Nintendo significantly added to these natural entry barriers by requiring developers of games for the NES to make those games *exclusively* available on Nintendo's system for two years after their release. This exclusivity provision (enforced by Nintendo's "lock-out chip" which prevented unauthorized games from playing on the NES) made it commercially impractical for independent developers of hit games to create versions for the Atari or Sega systems; as a result, a consumer wishing to play the same game as his friends was forced to purchase a Nintendo system.[7] Perhaps Nintendo would have dominated the video game business from 1985-1992 without these exclusivity provisions, but the fact remains that Nintendo's grip on the market relaxed only after it abandoned these practices in the face of antitrust challenge.

FTD adopted a similar strategy back in the 1950s. The FTD network was unquestionably an improvement in allowing consumers to send flowers to distant locations, allowing one florist to communicate with distant members using the telegraph system to arrange for floral delivery. FTD created a brand and logo, served as a clearinghouse for transactions, and

[7] Absent Nintendo's exclusivity rule, independently developed hit games playing on the Nintendo system could have been "ported" to rival systems, often at modest additional cost. Porting is common in personal computers, e.g., between the Apple and PC platforms.

enforced minimum quality standards. Once the FTD network was large, it had natural advantages over other networks that might seek to form. But FTD erected artificial entry barriers by preventing members of the FTD network from participating in other networks. These *exclusive membership* rules made it far more difficult for new networks to reach critical mass. In 1956 the Antitrust Division and FTD entered into a consent decree, under which FTD dropped its exclusive membership rule. After this, other floral networks such as AFS and Teleflora did indeed emerge.

In 1995, FTD launched a new program, "FTD Only," which provided financial incentives for FTD members to use FTD floral wire services exclusively. Although the "FTD Only" program was not as explicit as the earlier exclusive membership rules, it still imposed costs on florists for participating in other networks. The Antitrust Division claimed that the "FTD Only" program violated the 1956 consent decree, which prohibits FTD from offering financial incentives or rewards to florists for not participating in other networks.[8] In response, FTD dropped its new program.

Two other actions in recent years by the Antitrust Division fit into this same general category of exclusive dealing and exclusive membership rules in network industries: the Justice Department investigation of Electronic Payment Services, which dropped its requirement that member banks could not participate in other regional ATM networks,[9] and the Antitrust Division's October 1998 complaint against Visa and MasterCard, challenging their rules prohibiting member banks from issuing credit and charge cards for other systems, such as American Express and Discover.[10] The essence of my argument is that exclusive dealing and exclusive membership rules can prevent an emerging network from gaining the critical mass necessary to offer real value to consumers, which ultimately it must do to survive. Would-be early adopters of the new network are faced with what can be a prohibitive opportunity cost of joining the new network: cutting themselves off from the larger, established network. In situations where consumers or members would otherwise join multiple networks, this can be a decisive factor barring entry.

These concerns are all the more pronounced because of the crucial role of *consumer expectations* in network industries.[11] Each consumer,

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8 *See FTD*, 60 Fed. Reg. at 40,859.

9 *See* United States v. Electronic Payment Servs., Inc., 1994-2 Trade Cas. (CCH) ¶ 70,796 (D. Del. 1994).

10 *See* Complaint for Equitable Relief for Violations of 15 U.S.C. § 1, United States v. Visa U.S.A., Inc. (S.D.N.Y. Oct. 7, 1998) (No. 98-civ.7076), *available at* <http://www.usdoj.gov/atr/cases/indx57.htm> (visited Mar. 5, 1999).

11 For further discussion of the crucial role of consumer expectations in network industries, along with the likelihood of multiple equilibria, see SHAPIRO & VARIAN, *supra* note 3, ch. 7; Michael Katz & Carl Shapiro, *Product Introduction with Network Externalities*, 40 J. INDUS. ECON. 55 (1992); Michael Katz & Carl Shapiro, *Product Compatibility Choice in a Market with Technological Progress*, 38 OXFORD ECON. PAPERS 146 (1986); Michael Katz & Carl Shapiro, *Technology Adoption in the*

recognizing that others will be reluctant to try the new technology because of exclusivity rules, will shy away as well. The net result is that the upstart network may find it far more difficult to ignite the positive feedback necessary to prevail, especially when facing truthful marketing messages that the incumbent may communicate regarding its superior network size or the risks of trying the new network.

Of course, exclusive dealing and exclusive membership rules need not be anticompetitive, even in network industries. These contractual forms can serve to differentiate products and networks, to encourage investment in these networks, and to overcome free riding. I am certainly not proposing a *per se* rule against exclusivity in a network context. My goal is more modest: to point out that the anticompetitive effects of such provisions can be pronounced, making it less likely that any procompetitive benefits will tip the scales in favor of these practices under a rule of reason analysis.

II. EXCLUSIVE DEALING IN NETWORK INDUSTRIES VERSUS CONVENTIONAL INDUSTRIES

I hope that this discussion has made clear that exclusivity provisions can interact with network effects to create substantial barriers to entry. To further understand this interaction, it is useful to compare the effects of exclusive dealing provisions in network industries with their effects in conventional industries.

There are certainly situations in which exclusive dealing by an incumbent monopolist can raise entry barriers in traditional (non-network) industries. The underlying logic of this principle is nicely presented by Professors Rasmusen, Ramseyer, and Wiley ("RRW").[12] In the RRW model, the incumbent firm signs contracts with all customers, prohibiting them from purchasing from any entrant that might subsequently emerge. Facing these contracts, no entrant finds it profitable to enter the market. Critically, each individual consumer, correctly anticipating that no entry will occur, is willing to agree to be exclusive with the incumbent firm in exchange for a tiny discount associated with the exclusive contract versus a non-exclusive one. This model is offered by RRW as an attack on the traditional Chicago-School argument that exclusive contracts should be of

Presence of Network Externalities, 94 J. POL. ECON. 822 (1986); Michael Katz & Carl Shapiro, *Network Externalities, Competition and Compatibility*, 75 AM. ECON. REV. 424 (1985); *see also* Carl Shapiro, Antitrust in Network Industries, Address Before the American Law Institute and American Bar Association (Jan. 25, 1996), *available at* <http://www.usdoj.gov/atr/public/speeches/speech.mar> (visited Mar. 5, 1999).

12 *See* Eric J. Rasmusen et al., *Naked Exclusion*, 81 AM. ECON. REV. 1137 (1991); *see also* B. Douglas Bernheim & Michael Whinston, *Exclusive Dealing*, 106 J. POL. ECON. 64 (1998); Phillipe Aghion & Patrick Bolton, *Contracts as a Barrier to Entry*, 77 AM. ECON. REV. 388 (1987).

little concern because consumers can always refrain from signing such contracts if they operate against consumers' interests.[13]

One key assumption underlying the RRW argument is that the entrant produces subject to scale economies, making entry unprofitable unless a large group of consumers are available to be served.[14] Another key assumption is that no consumer is large enough to support entry on its own, which is combined with the assumption that consumers are unable to *coordinate* to sponsor entry.[15] When coordination issues are prominent, multiple outcomes (equilibria) are common. Indeed, RRW devote much of their paper to showing that there are typically multiple equilibria in their model: one in which all consumers sign exclusive contracts and another in which no consumers agree to be exclusive. Hence their ultimate conclusion: "One cannot claim that exclusionary agreements will always work. Neither, however, can one claim that they will never work. Whenever a monopolist can convince its customers that most other customers will sign an exclusionary agreement, it can obtain the agreements cheaply."[16]

Segal and Whinston ("SW") offer a number of corrections, refinements, and extensions to the RRW analysis.[17] SW show that the incumbent firm's ability to exclude entrants is increased if it is able to discriminate among buyers in its offers, and if it can make sequential offers (rather than simultaneous offers) to buyers. SW also consider "partially exclusionary contracts," whereby buyers agree to pay a penalty to the dominant firm if they patronize the entrant, rather than flatly agreeing not to do business with an entrant.

Without in any way denying that exclusive dealing provisions can elevate entry barriers in conventional markets, I believe that the magnitude of potential harm tends to be greater in network markets. In conventional markets, the key issue is whether an entrant can gain a sufficient scale of business to successfully cover its fixed (as well as variable) production costs. At least in the models cited above, the root of the entrant's problem is that production takes place according to economies of scale, so entry to serve just a few consumers is unlikely to be simultaneously profitable for the entrant and attractive to the buyers. After all, buyers must pay at least the entrant's average cost if the entrant is to cover its fixed costs.

In this context, call AC_E the average cost of an entrant serving several of the largest customers. Suppose that these customers could coordinate to sponsor an entrant with modest coordination costs. Then in equilibrium these customers will pay no more than AC_E to the incumbent monopolist.

13 *See, e.g.*, ROBERT BORK, THE ANTITRUST PARADOX 309 (1978).

14 *See* Rasmussen et al., *supra* note 12, at 1139.

15 *See id.* at 2, 3.

16 *Id.* at 1144.

17 *See* Ilya Segal & Michael Whinston, *Naked Exclusion: A Comment*, 89 AM. ECON. REV. (forthcoming 1999).

If the incumbent cannot discriminate among buyers, this is the most that any buyer can be charged. If the minimum average cost attained by the incumbent monopolist is AC_M, then the largest per-unit profit margin that the incumbent can protect using exclusive contracts is AC_E - AC_M. With a few large customers and moderate scale economies, entry-deterring prices may not be a great deal higher than competitive prices.

Compare this hypothetical to the situation prevailing in network industries. In a network context, what matters is not the absolute size of the "defecting coalition" of buyers who are considering whether to sponsor an entrant. Rather, what matters are the network benefits they would have to *forego* to do so, given the exclusivity required by the incumbent. Consider the benchmark case in which the value placed by each user on a network is proportional to the size of the network. In this case, the total benefits offered by a network rise with the square of the network's size. This relationship between network size and total value is sometimes called "Metcalfe's Law" in honor of Bob Metcalfe, the inventor of Ethernet.[18] In this case, the extra cost that exclusivity imposes on the consumers adopting the new technology is proportional to the number of users *not* part of that coalition. This cost can be very large, even for large coalitions. I conjecture that exclusivity can operate on a grander scale with network effects than with conventional scale economies [19]

Finally, I suspect that these effects become more pronounced once one fully incorporates into the analysis the dynamics of adoption of network products. In a dynamic setting, some customers are naturally slow adopters because they experience smaller incremental benefits from using the new technology, either because they have significant sunk investments specific to the old technology or because they simply have less need for the new. Absent network externalities, consumers keen to adopt the new technology would care little if some other consumers were naturally slow to adopt new technology. With network externalities, however, the presence of slow adopters means that any new network will quite naturally have to start small and grow gradually, and that the benefits to early adopters are small at first, until the network grows. In this setting, consumer expectations are all the more fragile, and the incumbent may be able to suppress the new and improved network by selectively signing exclusive agreements with consumers who would otherwise be pioneers, leading the way by adopting the new technology at a relatively early date.

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18 *See* SHAPIRO & VARIAN, *supra* note 3, at 184.

19 I label this a "conjecture" because I have not yet completed my more formal analysis in Carl Shapiro, *Exclusive Contracts with Network Effects* (forthcoming 1999).

III. THE ELEMENTS OF AN ECONOMIC MODEL OF EXCLUSIVITY IN NETWORK INDUSTRIES

This section briefly reports on my efforts to construct an economic model capturing some of these considerations.[20]

An incumbent firm controlling established technology is competing against a potential entrant that controls a new and improved technology. The incumbent firm moves first, establishing the terms on which its technology will be available to consumers. In a pure network context, these terms might be the cost of subscribing to the network. I consider two possible regimes, the "Standard Regime" and the "Exclusivity Regime." Ultimately, I am interested in comparing profits, consumer surplus, and market performance under these two regimes. In the Standard Regime, the incumbent simply sets a price for its technology. In the Exclusivity Regime, the incumbent also imposes the condition that consumers joining its network refrain from joining the rival network. In all other respects, the strategies in two regimes are identical.

After the incumbent chooses its price and contract terms, the entrant decides whether or not to enter the market. Entry entails a fixed cost, which includes research and development costs, product launch costs, and so on. If the entrant declines to enter, consumers then decide whether or not to purchase the incumbent technology. If the entrant does come into the market, the entrant then sets the terms on which its technology will be available, after which each consumer decides whether to use the established technology, the new one, both (if permitted), or neither. Consumers differ in their costs of adopting the new technology.

Network effects are captured with the assumption that consumers value a technology more highly, the more other users adopt it. In the presence of network effects, each consumer's adoption decision depends in part upon what that consumer expects *other* consumers to do. Consumer expectations can matter a great deal, and multiple equilibria are a distinct possibility. I look for *fulfilled expectations equilibria* (FEE), in which consumers' expectations are accurate.

I conjecture that in this model exclusive contracts can profitably and successfully deter entry by networks embodying superior technology. This danger appears especially pronounced if the superiority of the new technology primarily manifests itself based on the size of the new network, as opposed to "stand-alone" superiority that users enjoy irrespective of the size of the new network. I explore entry deterrence in two senses: (1) there is an equilibrium in which entry is deterred, and (2) there is no equilibrium is which entry occurs. These are different conditions in the presence of

[20] See *id.* for the formal analysis. Until that analysis is completed, the results reported here must be regarded as preliminary.

multiple equilibria. The latter condition is more restrictive.

I should note that the incumbent firm may choose *not* to employ exclusive membership rules, even if this is permitted. In particular, if the new technology is strong enough to enter profitably in the face of such exclusivity provisions, these provisions can work *against* the incumbent by inducing customers who would otherwise be a member of both networks to join only the *new* network. Indeed, with a sufficiently superior technology, the *entrant* might adopt exclusivity to undermine the value of the historical network controlled by the incumbent. In practice this would not happen overnight, but perhaps later once the entrant's network became well established.

IV. EXCLUSIVITY, COMPATIBILITY AND INTERCONNECTION

My analysis so far has centered on the question of whether a dominant incumbent network has the right to require its users to forego participation in rival networks, i.e., whether a dominant incumbent network can require exclusivity of its customers, suppliers, members, or other trading partners.

A distinct question that often arises in networks is whether a dominant incumbent network can deny rival networks the right to *interconnect* with its network. In real networks, interconnection takes a familiar form: allowing traffic that originates on the new network to terminate on the established network, and *vice versa*. In virtual networks interconnection takes the form of compatibility between the two networks (e.g., can data files stored in the old format, and macros written for the old software, work with the new?).

Let there be no mistake: lack of compatibility can be the death-knell of a new technology, even if it is superior in some absolute or stand-alone sense. And incumbent firms often have the incentive to exert their intellectual property rights to deny such compatibility to would-be entrants. As a general matter, I am wary of *forcing* an incumbent to open up its networks and provide interconnection against its will, unless the incumbent had previously made certain "openness" promises in order to establish its network in the first place. The question addressed here is whether exclusivity rules, *in addition* to such refusals to interconnect, can successfully deter entry.

In fact, exclusivity provisions can work in tandem with a refusal to interconnect in creating barriers to entry. By denying an entrant the right to interconnect, "compatible" entry can be blocked. And by imposing exclusivity, "incompatible" entry can be blocked. Thus, the two generic

entry strategies in network industries may be impeded.[21]

CONCLUSIONS

This Article explores, on a preliminary basis, the use of exclusive dealing and exclusive membership rules in network industries. Consumers in such markets are quite naturally reluctant to join new networks that are not connected to (i.e., compatible with) the dominant, incumbent network. Rules imposed by incumbents that prohibit consumers or members from joining a new network while still participating in the older network can deny the new network the foothold necessary to grow to become a genuine alternative to the established network. Exclusivity can also undermine consumer confidence in an emerging network. Such tactics can be and have been used to delay or blockade the emergence of new and improved technologies in network industries.

[21] *See* SHAPIRO & VARIAN, *supra* note 3, at 204.