

## 7 Competition, co-operation and predation in innovative industries

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The industrial organization of supply and innovation in high technology industries forms the backdrop for competition policy regarding those industries. I note some new strategic elements of the organization of the information technology industries. For this conference, with its focus on cartels, I direct attention to the implications for assessing cooperation among firms in these high tech markets.

The animating ideas behind my analysis are threefold. First, an essential output of high tech industries is innovation and technical progress. Cooperation among firms about price and quantity setting remains an issue, of course, though it does not raise any new analytical issues. Cooperation among firms about innovation and technical progress has the prospect of being far more economically important. If the cooperation is anticompetitive, preventing innovation competition among the cooperating firms by reducing either the rate of technical progress or its variety, then it can have powerful negative impacts on consumers, especially in the high-tech infrastructure industries. Correspondingly, if innovation cooperation among competitors is procompetitive, increasing the rate or variety of technical progress, it can have highly levered benefits to society and condemning it in error can be very harmful.

The second animating idea is that the important long run innovation competition in these industries is sometimes not immediately and directly related to current competition between sellers of close substitutes. For a number of reasons, firms may identify their most important potential future rivals among those who currently produce complements. Perhaps the most important reason is that many markets in these industries are highly concentrated with high entry barriers. Accordingly, the best available competition may arise in the long run as a result of the actions of current complementors. They may be the key

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\* I thank Wayne Dunham for helpful comments.

While I served in the Antitrust Division of the United States Department of Justice and continue, at this writing, to consult to the Division, this paper does not represent the opinion or policy position of the Division but only my own view.

partners of new entrants, may themselves be the most promising entrants, or may be the sponsors of, or among the coalition sponsoring, technical progress which renders existing monopolies valueless or lowers entry barriers into them. While economic analysis<sup>1</sup> and legal analysis<sup>2</sup> have not yet fully caught up with this development, industry participants have been living with it and analyzing it (at least in the United States) since two landmark events of the early 1980s, the forced vertical disintegration of AT&T and the voluntary vertical disintegration of the personal computer (PC) industry. In both telephony and computing, vertical disintegration has made long run competition among current complementors an essential mechanism for technical progress.

The third animating idea, and the one on which I shall spend the bulk of my time, is that these novel features of the industrial organization of innovation in high tech industries compel a new application of standing antitrust principles. They do not compel the creation of either a new highly interventionist doctrine nor a new doctrine with stronger *laissez faire* elements, as various observers have suggested. The key analytical elements of an anticompetitive agreement, and of a procompetitive one, remain the same familiar ones we already know, suitably translated to think about technological competition. There is, however, a definite need for clear thinking about the empirical proxies for those familiar analytical concepts. The map between “vertical” vs. “horizontal” on the one hand and “procompetitive” vs. “anticompetitive” on the other needs to be rethought in these industries.

An implication of the third idea is that the issue in antitrust analysis remains the same. It is to identify practices that harm competition, whether by excluding competitors or by inducing cooperative rather than competitive behavior among existing firms. This observation is something of a truism, I realize, but somehow the high-tech context induces observers to think that the role of antitrust analysis is to decide what specific market outcomes are good and to push toward them. This particular form of soggy thinking arises on both sides of antitrust debates, with one side tending to like existing market outcomes, however they arose, and the other side tending to think that the job of policy is to identify and pursue the better alternative.

To illustrate these points, I shall talk about a failed attempt to divide markets, Microsoft’s browser offer to Netscape of June 1995. While

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<sup>1</sup> See Brandenburger and Nalebuff (1996), Bresnahan and Greenstein (1999), and Bresnahan (1999) for attempts to deal with the issues.

<sup>2</sup> Baker (1999) with its analysis of a closely related circumstance, “industries with a dominant firm where innovation competition is effectively ‘winner take all’ and where fringe rivals are in a collaborative or complementary (as well as competitive) relationship with the dominant firm” is an important exception.

this offer did not lead to a cartel, it is nonetheless important: had it been accepted, the offer would have prevented so much innovation competition as to become a very strong candidate to be the most harmful 20<sup>th</sup> century agreement between competitors. (Much of that harm was ultimately visited upon society by other means, as Microsoft rid itself of the competition from Netscape by other anticompetitive acts after the offer was refused.) This offer serves the analytical purposes of this paper because the offer was made in a meeting between two firms that, at the moment they met, were not yet shipping products that were substitutes for one another but were shipping complements; the competition between them was prospective but predictable.

This raises important issues because cooperative agreements among rivals may be essential to the normal functioning of the industry and may be purely “vertical”. Rivals selling complements still need all the opportunities for cooperation – efficient, procompetitive cooperation – that sellers of complements normally need. In the high-tech context, rivals selling highly complex complements that interact in a deep way and that change rapidly with technical progress and market conditions may need particularly entangled communication and cooperation. At the same time, some other cooperative agreements among current sellers of complements will be the most dangerous form of naked market division agreement, as they will undercut entry (future competition) and innovation competition in a context where those are highly valuable.

These new structures also challenge our existing habits of mind in linking familiar antitrust concepts like “horizontal” to the world. I look at some procompetitive agreements among current competitors selling close substitutes. Interface standardization, in which firms agree on the mechanism by which an entire class of current substitutes will interact with another class of products, currently complements to the first, is a frequent example of procompetitive agreements. Of course, this does not excuse market-rigging conspiracies, but it does offer another interesting problem of telling pro- from anti-competitive behavior. This topic, which is taken up in a broader scale in another paper in this volume<sup>3</sup>, illustrates that applying traditional antitrust principles to new and important industry structures calls for attention to empirical detail.

### The structure of innovation in high-tech industries

Supply and invention in some high technology industries, notably important parts of information technology industries, is vertically disin-

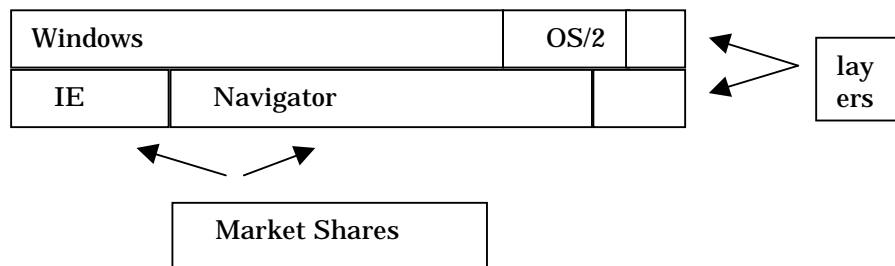
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<sup>3</sup> Cf. Halliday and Seabright (2001).

tegrated. The degree of vertical disintegration is not given and exogenous but rather subject to determination over time. Relatedly, vertical disintegration is an important source of competition and innovation.<sup>4</sup>

I illustrate the vertical disintegration in *Figure 1*, immediately below. I use the concept of *layers* to talk about the specific technologies or products that are, at any particular moment, substitutes for one another. The figure, for example, shows an Operating System layer (Microsoft's Windows and IBM's OS/2) and a Browser layer (Internet Explorer from Microsoft and Navigator from Netscape). In between any two layers there is an *interface*. Of course, in reality there are many layers (semiconductor, computer, applications software, server operating system, etc.) but the figure can be abbreviated without losing the points.

**Figure 1**



Holding the degree of vertical disintegration fixed, that is, holding product boundaries between complements fixed, powerful forces, some socially beneficial, some not, tend to lead to very concentrated structure for some of the “layers.” Not all these forces are given and exogenous; they are subject to both strategic influence by firms (for good or ill) and to policy intervention (wise or not.)

### Market structure and its persistence in layers

Many parts of IT are general purpose technologies (GPTs) that are used widely across a range of applications. Computer industry participants tend to use the label “platform” for anything that is a GPT, and to emphasize the value of building applications that go with a platform. For example, they speak of the Windows platform and the applications that run on it. Microsoft worried that the browser or the web

<sup>4</sup> See, e.g., Grove (1996) as an example of the many business people who have observed this and Bresnahan and Greenstein (1999) for economic analysis.

might become a new platform. Applications builders respond not only to the size of the market associated with a platform, the number of users of Windows, for example, but also to the ease or difficulty of writing applications for it. High usage of a platform is a source of network effects, as applications vendors can amortize their costs across many customers. Good design tools help applications writers make applications quickly, either for one particular platform (this is how most of the Microsoft-supplied tools for Windows applications development work) or for many platforms (“cross-platform”). The network effects between applications writers and users tend to mean that there are few platforms for any given body of commercial computer demand.

While markets in layers with platform elements are frequently concentrated because of the network effects, the corresponding applications markets may be concentrated or not. There are two distinct forces at work. The increasing returns to scale inherent in the design of IT products – the first copy costs are large, as a product embodies considerable knowledge, while reproduction costs are far smaller – tend of course to reduce the number of sellers, as do any network effects associated with specific applications themselves. There are also, however, considerable forces limiting concentration in some applications markets, including the value of differentiation to serve demanders with different needs, specialization to users in particular industries, countries, or professions, and so on. In personal computing before the arrival of the Internet, only a few applications were as ubiquitous as the operating system, notably spreadsheets and word processors. Most other applications – of which there are many – had smaller markets. It is important to emphasize about both applications markets and more “infrastructure” markets like those for operating systems that the forces leading some of them to be highly concentrated have ambiguous welfare economics.

Powerful forces, also with ambiguous welfare economics, tend to lead to the persistence of established positions in many circumstances, making both the firm’s problem and policy problems more difficult. The reasons have, in the case of platforms that are persistent, to do with sunk costs. It is well known that sunk costs in general lead to the possibility of strategy mattering as a source of market structure, and that they sometimes have this effect by making early success persist. (Note again that the persistence may be good or bad for society.<sup>5</sup>) In the case of platforms, it is often true that the users and the applications writers that form the core of the network effect will also have sunk costs. For example, applications writers may use platform-

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<sup>5</sup> See Sutton (1991) for the general theory and Bresnahan and Greenstein (1999) for application to computing.

specific features in an application. Ex ante, they may have more choice over platforms than ex post, after they have sunk the costs of designing those features. Similarly, users may learn to use a platform or the applications that are unique to it, thus sinking the costs of learning. These collectively sunk costs are a force for persistence – for good and for ill.

Many observers, on both the right and the left, make arguments with the same (symmetrical) mistakes about network effects and persistence. First, they argue that their side is right about the welfare economics. On the left, the first half of the mistake is to overemphasize the lock-in aspects of persistent established positions, while on the right, it is to overemphasize the increasing returns elements. The second half of both mistakes is to “know” what the right market outcome is and use this to favor an antitrust policy that leads to it. On the left, this takes the form of “knowing” that there is a strong tendency to incorrect market outcomes in these markets, while on the right, it takes the form of “knowing” that the markets will have found the right structure even if that is highly concentrated and persistent. Both of these arguments err in assessing the difficulty of figuring out the right market outcome in high tech industries. Both also misconstrue the proper role of antitrust analysis and antitrust enforcement, which is to ensure that market processes are unencumbered by the kinds of activities – be they agreements among competitors or attempt to exclude competitors – which prevent the best available market experiment from being conducted. Both left and right are using a regulatory rather than a competition policy framework here. Antitrust should be concerned with actions that neuter the competitive process, denying consumers influence on market outcomes, rather than with deciding what the right market outcome should be.<sup>6</sup>

The issue of lock-in and the possibility of an “inferior” technology winning is used as something of a red herring by both sides. Apparently serious people point out that there is actually supply of some things subject to network externalities, e.g., fax machines – and adduce this as evidence probative of the proposition that we should never worry about lock-in at all. Other apparently serious people suggest that the existence of dynamic network effects raises the dangerous likelihood of persistent bad market outcomes, ignoring the possibility

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<sup>6</sup> Of course, one would like to be sure that the resulting competition is highly valuable. For the argument that it is valuable in general to have fringe entrants who begin as complements compete in network industries, see, e.g., Baker (1999), for the idea that is a particularly good idea in computing at the time of the commercialization of the Internet see Bresnahan (1999), and for the idea that competition specifically from an independent Netscape browser would lead to highly valuable payoffs to consumers see, among many other analyses from Microsoft, Bill Gates’ pithy assessment in *The Internet Tidal Wave*, GX 20.

of socially valuable persistence. Both of these arguments are utterly confused for two reasons. (1) For antitrust analysis of network markets to sometimes lead to intervention, all that one needs is that the lock-in is something of an entry barrier, but not a totally insurmountable entry barrier. Then existing firms have anticompetitive incentives to protect themselves from competition and entry and may have the ability. (2) Both arguments confuse market outcomes – the welfare analysis of monopoly – with market process – the gaining or maintaining of monopoly power by anticompetitive acts. Monopoly is quite legal, so whether network effects are contributors to existing market power by the “wrong” technology is not part of antitrust analysis. If, however, the firm that has that market power expends resources to prevent competition on the merits by entrants, or uses that market power to reduce competition on the merits in a complement, the presumption reverses: absent a strong showing otherwise, we should assume that the new competition that is bad for the incumbent is good for its customers.

### Sources of competition for an established dominant firm in a layer

The nature and scope of the vertical disintegration affects the degree of competition in many of the layers. For certain layers, it is the main source of actual and potential competition, as market structure in them at any given moment tends to be highly concentrated. When there are opportunities for non-incremental technical progress the impact of vertically disintegrated structure can be quite powerful.

For a firm with an established position in a high-tech industry, especially for a firm with a monopoly or dominant firm position buttressed by network effects, the only competition in the long run may come from firms selling complements in the present. If the current industrial organization is vertically disintegrated, firms may identify their most important (future) rivals as selling (in the present) complements, not substitutes. A number of distinct mechanisms can make a powerful complementor a procompetitive force.

First, the complementor, knowledgeable about his partner’s business and involved in a closely related technology, can herself be potential entrant. Second, the complementor, by cooperating not only with the existing partner but also his nascent rivals, may act to reduce barriers to entry. Third, the complementor’s products may take on some of the functions of the partner’s products, engaging in a kind of partial entry. A variant of the third point arises when some new functions might be located in either the complementor’s or the partner’s layer. This third point is particularly important in markets like software, where the

same functionality can be moved across malleable product boundaries. Fourth, if existing or new technologies defining a network could be controlled by either partner or complementor, there will be rivalry over that control. In software, this will typically take the form of “applications programming interfaces”, or “platform” features – specific instances of the manner by which a particular software product interfaces with complements generally.

There is another reason why establishment of a complementary position may be an important part of competition. If there are entry barriers in a particular layer, a strong (present) complementor may be able to gain widespread distribution where a direct (present) competitor would not. This can make establishment of the strong complementary position a key first step in the (necessarily indirect) entry process.

The importance of future competition from current complementors comes by four distinct innovation routes. All are related to the basic economics of network effects. Network effects consist of positive feedback and social scale economies, and thus are a very good feature of high tech industries. Yet they are also associated with the possibility of lock-in. The interface standard at the center of network effects can be rendered obsolete by technical progress – but the dominant firm in the platform-defining layer will wish to prevent this. This leads to the four distinct points:

(1) competition from complementors can end locked-in positions by weakening entry barriers and giving consumers a choice where they had not had one for a while,

(2) if a complementor gains widespread distribution because it embodies new technology, it can be the beginning of leapfrog competition which takes the market to new and more valuable technological bases and network effects,

(3) competition set off by a complementor can take root quickly, while the other available entry routes are very slow,

(4) the choice between distinct directions for technical progress offered by current complementors offer opportunities for consumers to influence the direction of technical progress in the large, opportunities which are otherwise rare because of the power of network effects associated with existing standards.

In sum, potential future competition encouraged or engaged in by current complementors is a form of competition well worth protection from anticompetitive agreements (or from exclusionary practices not in the form of agreements). The important issues for competition policy in high-tech industries may be more in enabling opportunities to lower entry barriers, leapfrog competition, and rivalry over the long run than in concern about literal cooperation among existing horizontal



competitors, of whom there may not be that many in any event in many layers.

### The browser threat to Microsoft's monopoly position

The key issue to understand in assessing any contract's or offer's anti-competitive impact is the nature of the competition that would occur absent the contract. This is particularly important when the anti-competitive impact arises through undercutting potential competition, as is the case in the Microsoft offer to Netscape.

Microsoft's documents tell a clear and direct story of the mechanisms by which an independent, widely distributed browser – such as Netscape's – would have led to improvement in competitive conditions. The main mechanisms involve technical progress and entry, but not a distant, blue-sky prospect, instead imminent and clearly foreseen by Microsoft and other industry participants. In one kind of mechanism the browser lowers entry barriers into Microsoft's core monopoly, PC operating systems. Another mechanism has the browser becoming a partial substitute for operating systems, another, being the distribution vehicle for partial substitutes, such as cross-platform Java.

Operating systems have strong network effects. Users choose an operating system, in substantial part, because of the applications it lets them run. Applications writers, in turn, value an operating system that has many users, their potential customers. This leads to positive feedback effects that lead successful operating systems to grow yet more successful in their role as a “platform” for applications. Since both users' and applications writers' investments are, in part, specific to the platform and sunk, successful platforms tend to persist. They need not persist forever, however. When there is substantial new technological opportunity, users and applications writers will put relatively less weight on their existing investments and more on the new applications areas enabled by the new opportunity. This lowers entry barriers.<sup>7</sup>

An independent browser was the vehicle by which the commercialization of the Internet would be such competition – enhancing technical progress.

Microsoft's internal deliberations identified, in the spring of 1995, several key features of the Internet and the browser that threatened an increase in competition.

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<sup>7</sup> While Microsoft's defense team disputed this story loudly in court, the firm's employees believe it, act on it, and write it down with great regularity. I shall not rehearse that evidence any further, but direct your attention to sections II and III of the Findings of Fact, and, for sources in MS documents and elsewhere, to section II of the Plaintiffs' Revised Proposed Findings of Fact. See also MS' view of the issues (which did not prevail in court) at Defendants Revised Proposed Findings of Fact Section V.

- New and highly valuable application categories. This is obvious in hindsight, as many people now buy a PC to get access to the Internet and many other longtime PC users now access the Internet regularly. It was also quite clear to both Microsoft and Netscape at the time.
- The possibility of the browser as a partial platform for new applications categories. The browser might, after some technical progress, offer services to applications programs through “applications programming interfaces” (APIs), just as operating systems do.

New applications classes were likely to be focused on the Internet, thus some applications writers might focus on browser APIs not OS APIs.

- Applications might run on a different computer than the user was sitting at, called a server. The browser might become the mechanism for giving users access to server applications. Until communications speeds from servers grow very rapid, applications might run partly on servers and partly on PCs. The browser could be the distribution method for a divided-applications technology, like Sun's Java.

Microsoft identified all of these potentials and discussed them and reacted to them in ways that show what it feared was a loss of its existing market power.<sup>8</sup> Mr. Bill Gates, the CEO, explains the relevance of the browser threat in a detailed, eight-page single spaced memo, from which I take the header and two quotes, Government Exhibit 20 (GX 20)<sup>9</sup>. Mr. Gates sees the independent browser as bad for Microsoft by increasing competition (“commoditize the underlying operating system”) and innovation in a way that is good for consumers (“create something far less expensive than a PC”) but bad for Microsoft (“scary”):

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<sup>8</sup> I do not rehearse here the numerous analyses by senior Microsoft officials of the nature of the browser threat, which cover all of the distinct theories of why it might end the Windows monopoly just mentioned, excerpting only a few documents here. But see Section III of the Plaintiff's Revised Findings of Fact for more sources.

<sup>9</sup> The entire document is available in [http://www.usdoj.gov/atr/cases/ms\\_exhibits.htm](http://www.usdoj.gov/atr/cases/ms_exhibits.htm).

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To: Executive Staff and direct reports  
From: Bill Gates  
Date: May 26, 1995

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### **The Internet Tidal Wave**

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A new competitor "born" on the Internet is Netscape. Their browser is dominant, with 70% usage share, allowing them to determine which network extensions will catch on. They are pursuing a multi-platform strategy where they move the key API into the client to commoditize the underlying operating system. They have attracted a number of public network operators to use their platform to offer information and directory services. We have to match and beat their offerings including working with MCI, newspapers, and other who are considering their products.

One scary possibility being discussed by Internet fans is whether they should get together and create something far less expensive than a PC which is powerful enough for Web browsing. This new platform would optimize for the datatypes on the Web. Gordon Bell and others approached Intel on this and decided that Intel didn't care about a low cost device so they started suggesting that General Magic or another operating system with a non-Intel chip is the best solution.

Mr. Ben Slivka, a more junior Microsoft employee, analyzed the browser threat in more detail (cf. GX 1016, from which I take only a small part below) He, too, sees the problem in terms of loss of market power ("operating systems neutral") and as being *very* good for consumers (he was writing at a time when \$500 was far cheaper than most PCs):

### **The Web is the Next Platform**

5/27/95, bens (version 5)

My nightmare scenario is that the Web grows into a rich application platform in an operating system-neutral way, and then a company like Siemens or Matsushita comes out with a \$500 "WebMachine" that attaches to a TV. This WebMachine will let the customer do all the cool Internet stuff, plus manage home finances (all the storage is at the server side), and play games. When faced with this choice between a \$500 box (RISC CPU, 4-8Mb RAM, no hard disk, ...) and a 52Kpentium P6 Windows machine, the 2/3rds of homes that don't have a PC may find the \$500 machine pretty attractive!

Critically, Microsoft identified several perfectly ordinary market structure and distribution characteristics for the browser that made it particularly threatening. While these are sometimes explained in the language of the computer industry (e.g., “API”) that I have just introduced, their market logic is quite simple. The first three key ideas are about the ubiquity of browsers – a competitive problem for Microsoft.

- Large scale browser usage would attract applications writers' attention. Just as applications writers like popular OSs, they would also like a high-volume browser. Applications would be more likely to be written to browser APIs if a browser were widely distributed. Microsoft wanted applications writers to stay with Windows APIs, not to switch.
- Large scale browser usage would make the browser a distribution vehicle for the client side of applications-dividing technologies, such as Java.
- If the same browser could be used on both Windows PCs and other kinds of PCs (or on other, similar or smaller, “client” devices) users could switch away from Windows more easily. This would likely apply most strongly to users focused in the Internet. They might view Windows as substantially less differentiated than ordinary PC users do, if the applications they like to run were written for the browser.

Mr. Gates and Mr. Slivka point directly to these kinds of loss of product differentiation and entry barriers for Windows in the quotes above. This view was widespread throughout Microsoft once the implications of the commercial Internet became visible to the firm. The view was well documented beyond what I have shown you here and was at the heart of MS' decisionmaking<sup>10</sup>.

### Dealing with the threat

Of course, none of this would be a problem if Microsoft controlled the dominant browser, as they (unlawfully) do now. But in 1995, Microsoft was late to market, back on its heels, and saw no route to winning the browser war via improving its own browser and pricing it low (even zero). Accordingly, it determined the key features of the Netscape browser that were procompetitive and sought, by agreement with Netscape, to remove those procompetitive features. The key thing they wished to prevent was a Netscape-controlled browser that exposed the same APIs on both Windows PCs and other kinds of computers.

To avoid this, Microsoft did some things that were quite legal, such as developing its own browser and attempting to catch up to Netscape

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<sup>10</sup> Cf. sources cited in Section III PRPFOF.

in browser features and performance. As of the spring of 1995, however, Microsoft had not yet shipped any browser product, planning to release Internet Explorer 1 coincident with Windows 95 in the summer. At this stage, then, the threat from Netscape to Microsoft's monopoly position was in the future, though forecast by both firms, and the entry of Microsoft into the browser market with an actual shipping product was imminent. The series of meetings between the two firms, culminating in a key meeting in late June of that year, can thus serve to foreground the issues raised in this paper. The competition between the firms was prospective, and at the moment they were producers of complements who were about to come into competition in one firm's market (browsers) and about to lower entry barriers into the other's market (operating systems). They could forecast a near-term situation like that illustrated in Figure 1, with Microsoft dominant in the OS layer and Netscape dominant in the browser layer.

### The market-division offer

In the run-up to the June 21, 1995 meeting with Netscape, Microsoft internally debated two closely related offers they might make. One would have Microsoft browsers running in all new versions of Windows (starting with the one due to be released in two months, Windows 95) and Netscape browsers running on everything else (including older versions of Windows, Macintoshes, Unix computers, and so on.) The other variant was similar, with the Netscape *brand* of browsers ubiquitous, but not exposing APIs on the new Windows (Windows 95), instead relying on Microsoft software that would expose APIs. Either of these arrangements would prevent the "nightmare scenario" from coming true by preventing a cross-platform strategy by Netscape.

Microsoft recognized that Netscape, heretofore the "browser company" with a 85% browser market share, would not agree to these arrangements, as they benefited Microsoft while harming Netscape. To give up the Windows 95 browser would be to give up the future of the browser, as it was easy to forecast that Windows 95 would, quite soon, become the most popular form of Windows and thus the dominant PC operating system. To give up control of browser technologies on Windows 95 would be just as bad for Netscape, as that would undercut the possibility of enabling 3<sup>rd</sup> party applications based on their browser – the first point in building network effects is widespread distribution. At the same time, it would weaken Netscape's claim as the technology leader in the commercialization of the Internet, and thus undercut its role in setting standards for communication between end user computers ("clients") and the Internet. Anticipating Netscape's resistance, Microsoft sought to offer a quid pro quo. As Microsoft was proposing

taking the lion's share of the browser business, and as they did not yet have an even comparable browser product, they would need to make a serious offer. At the same time, they hoped to convince Netscape that the browser business, in and of itself, was not going to be profitable. This would lower Netscape's demand price for participating as the junior partner in the allocation of the market they had pioneered.

Microsoft considered both carrot and stick elements to its to get Netscape to agree. On the carrot side, Mr. Gates suggested giving Netscape a great deal of support to move away from software on the "client" (PC at which the end user sits) as that would necessarily involve competition with Microsoft, into "server"-side technologies. This would leave the two firms not competing for several years, in his assessment (Cf. GX 22). Microsoft officials considered warning Netscape about the dire consequences of being a rival of Microsoft, and suggesting a broad-ranging "relationship" between the companies including perhaps an equity share and a board seat for Microsoft. There was a lively email discussion of what to offer Netscape among the Microsoft employees who were going to attend, notably Dan Rosen and Thomas Reardon, up through Nathan Myrhvold and Paul Maritz, up to Mr. Gates himself, who wrote: "I think there is a very powerful deal of some kind we can do with Netscape . . . I would really like to see something like this happen!"<sup>11</sup>

At the meeting, Marc Andreessen (inventor of the browser and a Netscape founder) took notes on a laptop computer. These are in GX 33, from which I reproduce portions below; in most of these excerpts Mr. Andreessen is paraphrasing Microsoft attendees, so that the "you" immediately below is "Netscape".

Would you be interested in having a partnership where NS gets all the non-Win95 stuff and MS gets all the Win95 stuff? If NS doesn't want to, then that's one thing. If NS does want to, then we can have our special relationship. THREAT THAT MS WILL OWN THE WIN95 CLIENT MARKET AND THAT NETSCAPE SHOULD STAY AWAY.

Clearly, the market-division offer was made and it set Andreessen off, as you can see from his all-caps. The offer was apparently made in both forms. Andreessen again:

Potential point of contention - - -

Single most important element of your business is NSAPI. That's an API. Therefore that's a platform. Horrors. That's in conflict with us.

Other points in the narrative show that there was a carrot and stick. Andreessen paraphrases MS: "If we had a special relationship, you

<sup>11</sup> The quote is from GX 22, see also GX 18, GX 24.

wouldn't be in this position." and that the core issue was about whether to cooperate or not. "All of the relationship points revolve around critical fact of - - is Netscape the kind of company that's going to partner with MS on this or not?" The corporate-control arrangements were discussed as well, as were the threats and promises.

Microsoft would argue in court that the notes were cooked by Netscape's lawyers, perhaps much later. But they were emailed by Andreesen that very evening to attorneys, and a communication from another Netscape attendee to a colleague at AOL on the same day summarizes the meeting succinctly, with rather more emphasis on the stick than the carrot.<sup>12</sup> Cf. GX 34 (spilling over two pages of a contemporary email in AOL files):

Microsoft was at Netscape yesterday. Dan Rosen was there, the guy that did the UUNET deal. They wanted:

- equity
- a board seat
- Netscape to renounce the network as a platform
- Netscape to disclose all plans to Microsoft
- Netscape to limit access to API's.

And in return, Netscape would be Microsoft's special partner, get inside information, etc... and if Netscape didn't do the deal, Microsoft would crush them. It was funny to listen to Marc take umbrage at "arrogant 25 year olds from the University of Washington."

After the meeting, another exchange of emails among the Microsoft employees shows that a market division offer was made. Mr. Rosen, in three pieces I have taken from GX 537, summarized for superiors up to Mr. Gates Microsoft's main goal as the market division<sup>13</sup>:

Our goals going into the meeting were (in priority order):  
1. Establish Microsoft ownership of the Internet client platform for Win95.

ChrisJo summed up the purpose nicely. "We need to understand if you will adopt our platform and build on top of it or if you are going to compete with us o the platform level." All of the Netscape players were clear - they want to build on our platform as a first preference.

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<sup>12</sup> This is long before the AOL/Netscape merger, which was predicated on Netscape's later business difficulties as the threats made here were carried out. The communication speaks more to the gossipy and collaborative nature of Silicon Valley business - an efficient organizational response to the vertically disintegrated structure of innovation. Note the personal joke at Mr. Andreesen's expense.

<sup>13</sup> The entire exhibit may be found at <http://www.usdoj.gov/atr/cases/exhibits/537.pdf> or click on a link from [http://www.usdoj.gov/atr/cases/ms\\_exhibits.htm](http://www.usdoj.gov/atr/cases/ms_exhibits.htm)

On the client end, we discussed "sucking most of the functionality of the current Netscape browser (but not the toolbar, cool places or advertising) into the platform; they seemed OK with this concept.

As you can see, Mr. Rosen believed Netscape was going to accept the market division offer, but a more junior Microsoft attendee, Thomas Reardon, disagreed, arguing (also in GX 537) that Netscape grew tense when the market division was proposed, and that it was their true goal to "preempt" the planned Microsoft browser, Internet Explorer and to compete with Microsoft in a coalition of firms making complements. Mr. Gates, despite having not been at the meeting, resolved the dispute with perfect accuracy: Netscape was going to compete, not accept the market division.

Interestingly, the same meeting and others earlier and later also included other discussions on which the two firms were able to agree. These included technologies for secure transactions on the Web (STT) that were of value to both firms as standards.

In its lawsuit, the U.S. government characterized this as a failed attempt at making an agreement not to compete. Under U.S. law, failed agreements are illegal under section 2 of the Sherman Act. In contrast to successful agreements, which are illegal per se and have both parties liable, failed agreements have only the offering party liable and are subject to more exacting § 2 analysis.

It is clear from the documents we have just seen that MS threatened and bribed NS for the sole purpose of avoiding competition. Netscape did not accept the offer, instead, they complained to their antitrust counsel and to colleagues in the software industry. The two firms began the "browser war," ultimately won by Microsoft unlawfully. In later stages of the browser war as here at the beginning, Microsoft thoughtfully decided it could not win on the merits, and proceeded to win by an enthusiast campaign of anticompetitive attacks.

### Microsoft's defenses

In the antitrust case, Microsoft's defenses of its actions against the browser fall into two primary classes. These might be called "Hypercompetitive", in which the (strictly temporary!) Windows monopoly was in immediate danger of destruction at the hands of Netscape, excusing any acts, even those normally illegal under the antitrust laws, and "uncompetitive" in which Microsoft paid little or no attention to Netscape, as Netscape was of little strategic import and no real threat, just some irrelevant startup that foolishly tried to commercialize as an application a technology which Microsoft had long planned (ever before it was invented!) to include in the operating sys-



tem. To explain the market allocation meeting, Microsoft's attorneys chose a number of different variants on the "uncompetitive" theme.

The first was that the key meetings was a low-level one, attended by "no senior Microsoft executive involved in setting business policy" (DPFOF 1311). This was a tough row to hoe, in light of the extensive internal correspondence repeatedly going all the way to the CEO. The Microsoft witnesses tried to stay on message in court and in deposition. At the end of a long string of questions about the market division meetings, Mr. Gates went this far:

Q:... Do you recall whether you agreed that that's what Netscape was doing back in June '95?

A. (Mr. Gates): At this time I had no sense of what Netscape was doing. This is utterly incredible, in light not only of the correspondence about the market division meeting itself, which repeatedly involved Mr. Gates' leadership, but of Mr. Gates' brilliant memo of May 26, 1995, "The Internet Tidal Wave", an 8 page single spaced argument which changed the strategic direction of his company to deal with "a new competitor, born on the internet", Netscape.<sup>14</sup>

Relatedly, Microsoft's attorneys tried mischaracterization of the charges, "To the contrary, even if Netscape had accepted Microsoft's suggestion, and made much broader use of the Internet-related functionality in Windows 95 than it currently does, Netscape could have continued developing Web browsing software for Windows 95 with its own user interface and on which ISVs developing 'Internet-related' applications could rely". "According to plaintiffs, Microsoft sought to coerce Netscape to abandon its efforts to develop Web browsing software for Windows 95" a serious mischaracterization of the charges in several dimensions. MS goes on to argue that Netscape's desire to get information about Windows 95 shows that Netscape didn't want to stop such development. The mischaracterizations follow MS' usual rhetorical strategy of blurring logical boundaries. Mischaracterizations like this permitted MS to argue that Netscape's interest in competing with Microsoft in browsers while cooperating with them as an applications writer (a browser must run on an OS) shows (variously) that there was no competition between the two firms and that their relationship was extremely competitive on all dimensions.

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<sup>14</sup> In variant version, MS' attorneys attempted to characterize those who attended the meeting as were technologists, not business people. To anyone who knows the company, this is silly. For those who don't know the company, Microsoft introduced two serious studies of its internal structure as evidence at the trial. Both contain plenty of material that shows that Microsoft is very good at training articulate technologist / businesspeople like Mr. Reardon, who writes with verve and intelligence (if unlawfully) about the strategic situation not just the technical one. See Strossman (1996), ch. 2, and Cusamano and Shelby (1996), ch. 2.

A related, equally incredible, defense, was the one Microsoft led within its opening statements<sup>15</sup>:

As to the alleged market division that Microsoft supposedly proposed to Netscape on June 21, 1995 and which featured so extensively yesterday, . . . the evidence will show that Netscape's account of that meeting, uncritically accepted by the government, is fantastical. Whether that fantasy arose from the naivete of its author, Mark Andreesen, and was then promoted by his colleagues as a means of enlisting the government as Netscape's protector in the competitive battle with Microsoft, or whether it was concocted from the very beginning for that purpose, we cannot establish. But the evidence will show it was one or the other.

This is another tough row to hoe, given that the account in Andreesen's notes is confirmed by a number of Microsoft documents and by the contemporary communication with AOL. The defense similarly argued that Netscape's CEO's testimony about the meetings seemed to have changed in some details, that Netscape might have welcomed the offer if it had come before launching a successful product, and so on.

The proliferation of small, unconvincing defenses (the notes were cooked, etc.) goes on in this vein for some time, entirely characteristic of the defense offered in the case more generally.

More interesting because of its generality is Microsoft's other main line of defense, which is that the relationship between the two companies at the meeting was entirely technical cooperation between producers of complements. This is, of course, a quite serious antitrust defense if it can be shown. Microsoft put the point strongly<sup>16</sup> :

In fact, the computer industry would cease to function if developers of complementary products that interact with one another in technically complex ways could not talk about how those products interact, now and in the future.

Obviously, many conversations between complementors in the computer industry, are procompetitive; and the elaborate job of proving that proposition offered by Microsoft was entirely convincing if entirely irrelevant to the specific question of what went on in *this* meeting. The focus of this particular conversation was whether the *same* short run complement (Netscape's browser) would work with both Microsoft's product and others in a way that would foster competition, and whether it would be a pure complement or have some substitutable or competitive elements. The alternative to these was market division.

<sup>15</sup> Trial Transcript, October 20, 1998, morning.

<http://www.microsoft.com/presspass/trial/transcripts/oct98/10-20-am.asp>

<sup>16</sup> Defendants Revised Proposed Findings of Fact at ¶ 1330, hereafter DPFof 1330. This document can be found at <http://www.microsoft.com/presspass/trial/r-fof/>.

That should not be made legal just because other conversations between the same firms are procompetitive.

A related defense point is that the relationship between the two companies, while more competitive after the meetings, continued to be polite and involved more interactions of a competitive sort and also more cooperative ones. Netscape did not stalk off in a huff. This doesn't prove much. Nearly every firm in the computer business needs to have a working relationship with Microsoft. Certainly the producer of a mass-market application, like Netscape, does. This point, it seems to me, merely reinforces the broader point that, in this industry, it is not who comes to the meeting but what they say which matters for competition.

### “Vertical” agreements that restrict competition

The first deeper question is the evidentiary one. Can courts, looking at current producers of complements who are potential competitors or potential sources of third-party competition, discriminate between procompetitive agreements or offers – ones that relate to the efficient coordination of complements – and anticompetitive ones? This issue is dramatized by the presence of both kinds of discussions in the same meeting. The drama, however, for all the opportunity it gave defense counsel to throw up smoke and dust, should not distract us from the real issue, which is, can a court reasonably decide, on evidence like the documents I just showed you, that a discussion was anticompetitive? The issues are not all that different from those that are presented in a merger buying a potential entrant.<sup>17</sup>

In the Microsoft case, the court had the considerable advantage of numerous documents which laid out the competition-avoidance purpose of the proposal in clear business terms. The key fact issues the court had to resolve about browser competition were very easy ones: “My browser will run on operating system A, yours will run on operating systems B and C, and I'll pay you for this. If you won't agree to that, here's how you have to restrict your product running on operating system A, and I'll pay you for that”. Hearing all the industry jargon that was wrapped around that offer was no more difficult than coming to understand geographic sales territories in a more familiar kind of market division matter. The division of the browser market was an offer between a firm that was about to enter and an existing firm. By the time the district court heard the matter, the entry had occurred and the two firms had spent several years with the sum of their two

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<sup>17</sup> Indeed, the first theory of harm to competition raised in the “Non-Horizontal Merger Guidelines” stems from the acquisition of a current complementor who is a potential entrant, exactly the theory of harm in the Microsoft/Netscape meeting.

market shares over 90 percent. Thus it was not very difficult to assess the import and impact of the attempted offer.

More difficult was the court's need to understand what an API was, why the second variant of the offer was as anticompetitive as the first, and why there was a huge impact of the offer on competition in the operating system itself. Here the MS documents are very helpful, for they make clear that the same anticompetitive purposes could be met by the two different offer variants. Indeed, officials of both companies clearly agreed on the fundamental anticompetitive nature of the offer actually made. Ultimately the anticompetitive impact on the operating system market – a vertical theory of why this horizontal market division would be even more anticompetitive – was convincing because of (1) documents explaining those anticompetitive purposes, like the ones adduced above and (2) the role of the market division offer as a kickoff to a pattern of unlawful attempts to blunt the impact of an independent browser.

It seems to me that there is a clear limit here. Without support from documents and the testimony of industry participants, experts, etc., the court might have difficulty determining what the interfirm discussions were talking about. Jargony, technical, or in-group language, certainly common in high-tech industries as in many others, requires elucidation. In cases of genuine uncertainty about the import of what was said (not a condition met here) it seems that the appropriate standard should be cautious, for the alternative hypothesis when the discussions are among present complementors is that the contract is efficient coordination. There is no such uncertainty in the present instance.

More generally, it is not obvious that the enforcement authorities or the courts should expect to see very many agreements of this form or that they should expect to often find them anticompetitive when they do. Consider, for example, the situation of the personal computer industry in the mid 1980s. IBM had created the dominant standard, and had much of the role then that Microsoft has now. IBM had, however, permitted some competition in its own layer (by having an open architecture) but also had encouraged strong complementors such as Intel and Microsoft in other layers. What if IBM had undertaken actions to lower the threat of increased competition in the PC business sponsored by Intel or Microsoft? Indeed, IBM did own a large stake in Intel for a while, and is reported to have had the opportunity to own an even larger stake in Microsoft.<sup>18</sup> Should a court have found those agreements anticompetitive, if, counterfactually, IBM had bought the Micro-

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<sup>18</sup> See Brandenburger and Nalebuff (1996) for discussion of what this would have done strategically.

soft shares? It seems to me very difficult to imagine that. IBM did not understand the role of its partners in fostering competition very clearly (selling the Intel stake after a while and failing to buy the Microsoft one) and I would be amazed to discover a documentary record that would clearly show that IBM's goals were anticompetitive. The documentary record in the Microsoft case is available to us because many, many Microsoft executives understand how IBM lost its position as sponsor of the PC platform, and dedicate themselves to making sure they never face competition in their own layer nor strong complements (such as the independent browser) that might encourage such competition.

### Forward-looking agreements

Another potential limitation arises because high-tech anticompetitive agreements are often forward-looking. They involve avoiding technical races that are just starting, allocating future markets, preventing entry, and so on. This raises both nonserious economic arguments and a serious evidentiary one<sup>19</sup>.

The first nonserious economic argument is specific to industries of this kind. Sometimes people argue that the future is foreseeable, and that the market will ultimately be a monopoly under network effects and thus agreements not to have a technology race should be legal. This may often be true and should always be unavailing. Here we have an excellent example of a "good cartel" argument, a kind of argument which should not affect the liability standard conceptually. Innovation races are valuable for consumers, as is the development of technological alternatives which the market might choose.

A second nonserious economic argument is that it is impossible to forecast the future, and thus unwise to intervene when one doesn't know how much competition will be blocked by the agreement. This is a real mistake.<sup>20</sup> If business people were willing to put down real resources to compete, and avoided that competition by agreement, we should not stop to ask whether much good would have come of their competition. It is the job of the business people, not the burden of proof of the antitrust authorities, to forecast the future, and if acting unilaterally firms see different technical directions as optimal, the right market process is to have them struggle for customer approval.

The forward-looking nature of these kinds of agreements does lead to an evidentiary limitation. The fact that the technologies or products would have been in competition cannot, in the case of an agreement

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<sup>19</sup> The issues here are the same as in any merger.

<sup>20</sup> Baker (1999) makes this point at some length.

not to enter or more generally not to compete in the future, be easily verified by looking at the marketplace. As with other agreements involving a potential entrant, the possibility of competition but for the agreement must be inferred from such sources as the plans and forecasts of market participants. This is a far larger problem in the case of mergers with potential entrants, less of failed cartelization offers. If asked to block a merger, a court will have to look into the future at the time of the potential reduction in competition. If asked to adjudge a refused offer of payment to an entrant to stay out, the court will have the advantage of looking at market events between the offer and the trial, including the success of the entrant if any.

This need for evidence to determine whether an agreement or offer is anticompetitive or not leads also to the problem of cartel detection. In the Microsoft/Netscape incident, Netscape immediately communicated a transcript of the meeting to antitrust authorities (responding to an open investigation separate from the one which ultimately led to the trial) so this case falls, like those involving disgruntled former conspirators, into the easily detectable class. Netscape's motives had nothing to do with aiding cartel enforcement, of course. The letter their antitrust counsel sent to the authorities emphasizes the stick over the carrot.<sup>21</sup> Netscape was quite concerned with the "stick" part of Microsoft's offer, the threat of a predatory campaign to remove the competitive possibilities afforded by the Netscape browser. Netscape's private interests, of course, also would lead them to a desire to be protected from Microsoft's legitimate browser competition. Knowing how deeply U.S. antitrust authorities dislike protecting competitors from competition, Netscape's counsel's letter attempts to document a case that Microsoft's near-term plans are anticompetitive. They do not forecast the verve, enthusiasm, persistence, and utter disregard for the law that ultimately characterized Microsoft's browser campaign.

Obviously, not all failed agreements, and precious few successful ones, will have a participant in the discussions taking detailed notes and calling the authorities. Gossipy and collaborative, high-tech industries often involve substantial efforts to involve third parties in nas-

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<sup>21</sup> Although Microsoft's argument that the agreement is not mentioned is nonsense. Cf. GX 1259 at page two, where the plan is summarized as on in which Microsoft "otherwise controls Netscape's ability to compete against Microsoft", and "As you will see from the enclosed documents, the general theme of the negotiation has been that Microsoft owns the platform and that if Netscape is going to compete with Microsoft in any way ( at the platform level or the application level), then Microsoft will competitively harm Netscape." Further: "It is contemplated that Netscape would be required to tell Microsoft ahead of time what Netscape is going to do and that Microsoft would be able to take what it wanted of Netscape's ideas and build them into the Microsoft platform. Conversely, however, Netscape would not be able to build anything that even remotely resembled a platform that might compete against the Microsoft platform - and, in particular, Netscape would not be able to build anything that had its own Application Programming interface (API)".

cent technology initiatives. The vertically disintegrated and specialized nature of invention compels this. The complementors often prefer competition among the initiatives, either for the usual economic reasons or to hedge bets about technical and market uncertainty. They form a potentially rich mine of complaints and evidence.

### Procompetitive agreements among competitors

The other oddity that the structure and competitive behavior of these industries bring to the fore is the possibility of procompetitive agreements among direct horizontal competitors. Certain interface standard agreements have this characteristic.<sup>22</sup>

By an interface standard agreement, I mean a situation in which the software or hardware of a number of different firms will interact at the interface between layers (cf. Figure 1, above) according to agreed-upon specifications. I focus here on agreements among direct horizontal competitors on an interface standard in which each of their competitive products will interact with other kinds of products according to the same specifications, at least in part. Not all interface standards are set by agreement. Some are imposed by dominant firms in the layer on one side of an interface. Sometimes there are races between competing standards, one of which becomes dominant. Sometimes the interface between two layers has two or more mutually incompatible standards. Further, the agreements are usually sanctioned by some kind of industry-wide body, whether official or private.<sup>23</sup> All that aside, the mechanism of agreement between all market participants (both sides of an interface) or all participants in one layer (one side) remains empirically important.

Let me begin, dangerously, with some welfare economics. The primary reason to encourage interface standard setting in general is that it provides a mechanism for the competitive division of inventive labor. If the standard for an interface between two kinds of technology products is open and accessible to all firms on each side of the interface, innovation can be undertaken in a decentralized and modularized manner. This has been a great boon to invention in the personal computer and Internet industries, to name just two. Even when the interface standard is set by agreement among competitors, it can amount to an agreement *to compete*, rather than an agreement *not to compete*. Fixing an interface standard reduces product differentiation among

<sup>22</sup> Cf Anton and Yao (1995), Brown (1993), Economides and White (1994), Katz and Shapiro (1998) and Ordover and Willig (1985) for earlier treatments.

<sup>23</sup> An overview of the interface standard-setting process from a practitioner's perspective can be found in the two books by Carl Cargill (1989, 1997). An influential review of the economics of centralized vs. decentralized processes can be found in Greenstein (1996).

products on one side of the interface. Thus, in the short run, competition is increased.

The cost, of course, is that competition between standards, which can entail invention, is foregone when there is such an agreement. There can be important and socially valuable competition between standards. One firm or coalition of firms may, for example, choose a standard which is backwards-compatible with existing technology, while another firm attempts a breakthrough. If the market experiment is not run, the outcome is determined without input from the buyers about whether a breakthrough would be valuable. Similar difficulties arise if there are important distinctions between the technical capabilities of two or more proposed standards. Having sellers choose among them collectively disenfranchises customers if customers might have chosen distinctly.

Turning now from welfare analysis to practical policy analysis, it seems to me that it is *not* a practical suggestion to base competition policy on a detailed and quantitative empirical assessment of whether, in any particular circumstance, the competition within the standard in the present outweighs the competition between standards over the future. This will, in many circumstance, barely clear to industry participants (and they may differ in their assessments) much less determinable in a reasonable amount of time by outsiders in an enforcement agency or a court. Similarly, it seems to me unwise to attempt to draw a bright line between circumstances that are likely to be procompetitive and those which are likely to be anticompetitive, classifying the latter as illegal by the analogy to price fixing conspiracies and the former as legal unless anticompetitive purposes or outcomes can be shown.

The complex mix of circumstances in which there is simply no social value to competition between standards is one powerful reason to avoid bright lines. If two standards (in this case, for transferring information about people, say, customers) differ only in that one encodes customers' names as "Last Name, First Name" while the other uses "First Name-Last Name," then little is gained by running a race between them. The difference between the standards introduces meaningless incompatibility and nothing else. I introduce this example for two related purposes, both of which are discouraging about bright line rules. First, my argument that there is not much to be gained is convincing, isn't it? But think about how you were convinced. You know enough about the technology of computers – everyone does now – to see that I am right. In most practical instances in the policy arena, it takes time and effort for enforcement officials or courts to understand such things (though they can.) My second reason for caution comes from the economic logic of the example, which I think has some gener-



ality. The competition between those two standards is not very valuable because the two standards are very similar, functionally. In anti-trust analysis, we are used to the idea that competition between closer substitutes – similar, functionally – is what we are trying to protect, but in this context the opposite can be true.

A different circumstance but another in which attempting to preserve competition is probably wasteful arises when there has been something of a standards race, but the outcome has already been determined in the marketplace. At that point, sellers' working out the details of the already-known standard serves to remove meaningless incompatibility, not to prevent competition. Practitioners report that this "sweeping up" is by far the most common form of collective standard setting, at least in the formal public and quasi public standard setting bodies. It may be very difficult for outsiders to determine when a standards race is over; look how many people take seriously Microsoft's hilarious argument that the browser standards setting race is ongoing.

It may not be possible to have any market at all without setting a single standard, for either of two distinct reasons.<sup>24</sup> First, clearly there are network effects associated with standards, so that there are social economies of scale associated with them. By their very nature, such social scale economies can only be achieved by common use of standards by many other firms. Second, while the firms may be direct competitors in the product market, they may nonetheless have invented different, complementary elements of a new technology. This is often thought of as the problem of multiple blocking patents, but it is not simply a point about formal intellectual property rights. Firms may be complementors in invention though competitors in product markets, a situation in which agreement about intellectual property is likely procompetitive. Standard setting is then the task of finding a standard which is not infringing of any firm's IP, at a minimum one where all the potential infringements are known to all firms. Many standards-setting bodies have formal or informal rules to ensure that their members behave this way.<sup>25</sup> In this case, the "agreement among competitors" is actually a contract among complementors that permits competition. Again, these are the kinds of issues which can be resolved with time and care in particular instances, but which argue against a bright-line rule-setting exercise.

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<sup>24</sup> If there is some reason to think the collaboration as anticompetitive, these should be treated, I would say, in parallel to the cost savings arising from a merger that results in superior exploitation of scale economies, even though it arises from an agreement among competitors.

<sup>25</sup> The one antitrust case concerning standards-setting I know of, the FTC investigation of Dell, concerned exactly these issues.

Relatedly, there are the problems posed by the standard-setting agreement among a coalition which is a subset of firms. Those on the outside of the coalition tend to say these are exclusionary, designed to prevent valuable competition from making it on to the level playing field defined by the standard. Participants tend to say either (1) that among the excluded are firms who might set a *de facto* proprietary standard alone, so that the agreement among the rest is the best chance for competition between standards (2) that the excluded firms are ones who might want to destroy rather than participate in the collective standard setting process, or (3) that the excluded are technologically inept and irrelevant, so that the exclusion is efficient. Arguments (1) and (2) were routinely made about IBM in one technological era, and are now routinely made about Microsoft – in both cases by other firms or coalitions of firms who were attempting to set a separate standard in competition with the *de facto* standards associated with those dominant firms' technologies.

These are circumstances in which the exclusion seems efficient. The only available mechanism for competitive standards-setting may be a duopoly of potential standards: dominant firm versus ROW. Obviously, these are circumstances in which one should be careful about the exclusion argument – poor IBM whining that DEC and Wang were trying to predate it out of the computer business! poor Microsoft whining about the “anticompetitive” aspects of Java standard-setting! – consistent with the broad general principal that exclusion arguments should involve a plausible mechanism by which the “prey's” competition is reduced.

An “ideal” policy would encourage the long run competition between standards without discouraging short run competition within the standard or preventing the formation of any interfaces and markets at all, if antitrust policy were capable of being “ideal” in a welfare economics sense. Such an ideal standard is not practical. We are left with the need to apply the logic of anticompetitive agreements or anticompetitive attempts to exclude on a standalone basis in each instance. Much of my reasoning comes from worrying more about anticompetitive acts – like those identified above – that prevent competition between standards. The competition could take the form of racing to establish a *de facto* market standard or possibly having longstanding specialized or differentiated “standards,” or at least (not fully standardized) differentiated interfaces. The question of harm to competition is (1) whether there was the realistic prospect of socially valuable racing or longstanding competition and (2) whether the agreement has as its purpose avoiding such racing or competition. This is not, in its logic, all that unfamiliar an antitrust test, and there is no reason not to apply it in these circumstances. Application will, I suspect, lead to

the continued rarity of prosecutions. The thing that at first glance seems anticompetitive – an agreement among competitors on a standard – will almost never be condemned. The opportunities that extra-market interactions among competitors (e.g., in standards-setting bodies or in negotiations) for anticompetitive shenanigans will, on the other hand, likely yield some provable anticompetitive acts.

## Conclusion

Perhaps the most important point of this research comes from thinking carefully about Ray Noorda's ugly but evocative term, "co-opetition". The structure of innovation in the high-tech industries leads, he meant, to the same firms simultaneously having complementarity and substitutability relationships with one another, often on different time scales.<sup>26</sup>

Co-opetition does two things to antitrust analysis, at a high level. First, as I have been emphasizing here, it transfers our attention from the *names* of the participants in a contract combination or conspiracy to the *nature* of the agreement. This is not, conceptually, a radical step at all; but it does lead us back to the first principles of antitrust analysis rather than suggest the possibility of anything remotely resembling per-se rules or even bright-line legal standards. The root cause is the breakdown in the simple map "vertical", "procompetitive", "horizontal", "anticompetitive". Second, this analysis suggests difficulty in cleanly separating cases of competitors cooperating too much, thereby restraining trade, from cases of competitors excluding or chastening other competitors, thereby monopolizing.<sup>27</sup> (There remains the standard difficulty of telling either or both of these from procompetitive actions.) This, too, seems to be ultimately the result of co-opetition. Agreements among co-opetitive firms can mix three very different elements: efficient coordination, exclusion of non-agreers, and reducing competition among the agreers. Over the wide range of strategic, market, and technological circumstances in which these agreements will arise, the three elements can be present in any proportion. This calls for discipline and rigor in stating the mechanism by which any particular agreement or offer harms, or would harm, competition. It calls for no new doctrine whatsoever.

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<sup>26</sup> The tendency to vertical disintegration and specialization may spread to many other industries. Nalebuff and Dixit suggest, and may do so in a way that divides functions and capabilities of strategic importance. This would make the point more general.

<sup>27</sup> In this regard, my analysis parallels formal cartel theory.

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