"Competition Policy for Computer Software Markets"

Abstract

Against the backdrop of the ongoing *Microsoft* antitrust litigation, this paper examines issues of competition policy for computer software markets. US antitrust law provides the main focus, but occasional parallels are drawn with the EU competition regime. A "dynamic compatibility regime" is proposed. This involves a recognition that various restrictions (e.g. the exclusionary rules of a joint venture, or strong intellectual property protection) work to provide the initial safeguards or incentives necessary to encourage firms to engage in winner-takes-all "standards races". Once a standard is established, however, the argument for such restrictions becomes far less convincing. Competition policy should recognise that quality access to the technical information underlying an established standard is likely to be indispensable for effective, ongoing competition in related markets. Where this is the case, the policy goal should be to encourage interoperability (i.e. compatibility between products which are complements to the standard) by compelling access to that information.

Part One begins by considering the policy goal of "maximising consumer welfare" within the context of computer software markets. There follows an analysis of the economics of network industries in general and software markets in particular. The nature of competition in software markets is examined; this leads to the conclusion that policy should encourage compatibility.

The network effects analysed in Part One dictate that few firms can individually develop and advance a new standard: collective efforts are common within the computer industry. Part Two considers the antitrust treatment of collective standard-setting within network industries in general, making the relatively uncontroversial argument that a dynamic compatibility regime is appropriate. However, there is another aspect to this argument: the nature of collective standard-setting means that a number of firms will control the direction of a standard. In itself, this will go some way to ensuring that variety and competition can thrive within that standard.

Part Three discusses the ongoing *Microsoft* case. It is submitted that the strained approach taken by the DOJ and the Circuit Court fails to convince and that "Raising Rivals' Costs" theory represents a means of analysing the issues that better reflects the nature of competition within the software industry. "Raising Rivals' Costs" (RRC) involves conduct that raises costs and induces rivals to restrict their output, thereby allowing the dominant firm to exercise monopoly power. *Microsoft* illustrates that software markets are prone to RRC through technological input foreclosure, such foreclosure being the result of restricted access to the interface information necessary to produce interoperable products or of contrived incompatibility. These "incompatibility strategies" are examined in Part Four.

Part Four analyses the appropriate antitrust response to dominant firm conduct designed to render previously interoperable products incompatible with an established standard. A focus on the complementary nature of the relationship between a dominant firm and the firms with which it competes in complementary markets is favoured. The final discussion considers whether a dynamic compatibility regime can extend beyond situations where a *change* in policy has resulted in incompatibility, to imposing a *positive* obligation on dominant firms to allow access to technical information to the extent necessary for the development of interoperable products. An argument in favour of qualifying both the term and scope of copyright protection for software is constructed, and some consideration is given to the impact of compatibility on innovation incentives.

(19,100 words)

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I. THE NATURE OF COMPETITION IN COMPUTER SOFTWARE MARKETS

INTRODUCTION

I shall begin with the statement that the only legitimate goal of competition policy is the maximisation of consumer welfare.[1] But this is naïve: in practice, competition policy often extends beyond considerations of consumer welfare or efficiency.[2] For example, Whish has said that competition policy "is an expression of the current values and aims of society and is as susceptible to change as political thinking generally".[3] This is not reassuring though, and the argument that courts applying competition policy cannot consider other values for the simple reason that there are no criteria to guide a decision is more satisfying.[4] It may be that this stance is adopted for reasons of convenience: after all, this is a paper on competition policy, so the difficulty of structuring and maintaining a coherent argument would increase with each additional policy goal recognised. Equally, it may be that competition policy itself becomes less coherent with the inclusion of additional policy goals.

Maximising consumer welfare requires that "society's resources are allocated so that consumers can satisfy their wants as fully as technological constraints permit".[5] Competition policy should therefore seek to preserve and reinforce the economic mechanisms that compel firms to respond to consumers. In the context of the computer software industry, the policy statement could be expressed as follows: competition policy should not attempt to decide which technology or industry structure is "right", but should instead attempt to maximise the influence of users in determining outcomes. Shapiro argues that the fact that the "key driver of consumer benefits in information industries is technological progress" requires that the primary goal of antitrust must be "to promote

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[1] Bork, *The Antitrust Paradox* (1993) at 50-89

[2] This is particularly true of the EU Commission: see Whish, *Competition Law* (1993) at 12-16, 28-29. Monti has said that competition policy "is also strictly connected with…the creation of the single market", "European Competition Policy for the 21st Century", (20 October, 2000), Fordham Law Institute, available at http://europa.eu.int/comm/competition/speeches/index_speeches_by_the_commissioner.html. See also Maher, "Competition Law and Intellectual Property Rights: Evolving Formalism", in Craig and de Búrca ed., *The Evolution of EU Law* (1999) at 604: "Three objectives have been identified by the Commission: to keep the market open and unified; to maintain a level of competition in the common market, such that the objectives of the Community can be achieved; and to ensure fairness in the market. As a tool of integration, competition policy is in turn shaped by the overall integration agenda of the Community; the nature of the subjects of its competition norms; and the complex and divergent societies within which that policy is to be applied."

[3] Whish, *op. cit.*, at 13

[4] Bork, *op. cit.*, at 91. In his prepared testimony before the Senate Committee on the Judiciary Subject: "Competition, Innovation, and Public Policy", (November 4, 1997), Charles Rule said that "the touchstone of antitrust is 'consumer welfare'. This means that the statutes are directed at economic concerns – not social or political ones – and that the law protects 'competition and not competitors'. The antitrust laws regulate the 'means' of the competitive process, not the 'ends' produced by that process – i.e. they do not condemn success nor do they protect competitors from failure."

[5] Bork, *op. cit.*, at 90

and protect competition in the introduction of new and improved products and services".[6] It has been said that competition in the computer industry is characterised by long "eras" of stable structures and standards punctuated by "epochs" of wrenching change, where firms engage in fierce, winner-takes-all "standards races".[7] A theme of this paper will be how competition policy can best encourage ongoing competition on the basis of price, quality and innovation within those eras of stable industry structures and standards.

NETWORK EFFECTS AND STANDARDS

Network industries[8] are characterised by demand-side economies of scale known as "network effects": the value a user ascribes to a particular product increases as the number of users of that product increases ("positive feedback"). This may include situations where one user's value for a good increases when another user has a compatible but non-competing good. In a "virtuous cycle", as the number of users of a particular operating system (OS) increases, software developers face increased incentives (in the form of larger markets) to write applications for that OS. The increased number and variety of applications available to users of the OS work to make the OS more attractive, enticing further users. And, increased use creates an information asset that can guide future development, allowing for added features and improved quality.[9]

The fact that components are interchangeable and backwardly compatible allows users to stick to the same standard over time. However, another implication of backward compatibility is that users' sunk costs can lock them in to a particular standard. And, "the very demand-side economies of scale that induce the formation of a network in the first place can serve as barriers to competition against the network".[10] This is so because

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[6] Shapiro, "Antitrust in Network Industries", (January 25, 1996), Address before the American Law Institute and American Bar Assn., available at http://www.usdoj.gov/atr/public/speeches/shapir.mar.htm. See also Salop and Romaine, "Preserving Monopoly: Economic Analysis, Legal Standards and *Microsoft*", (1999) 7 George Mason Law Rev 617, at 619: "In the case of software, output also would include innovation; thus, monopoly power is the power to restrict innovation below the level that would exist in a more competitive market."

[7] Bresnahan, "New Modes of Competition: Implications for the Future Structure of the Computer Industry", in Eisenach & Lenard ed., *Competition, Innovation and the Microsoft Monopoly: Antitrust in the Digital Marketplace* (1999) 155, at 156. Bresnahan's paper contains an excellent discussion on software industry structure and its implications for competition. (For an interesting earlier analysis, see Bresnahan and Saloner, "Large Firms' Demand for Computer Products and Services: Competing Market Models, Inertia, and Enabling Strategic Change", (1994) Harvard Business School, Research Paper No.1318, at 27-35.)

[8] These are (obviously) industries characterised by network effects. It is important to distinguish natural monopolies, which arise from supply-side economies of scale and which may therefore warrant analysis under the essential facilities doctrine.

[9] Pitofsky notes that profits derived from dominating a network may be a "fair return" to innovators who achieve dominance: "Antitrust Analysis in High-Tech Industries: A 19th Century Discipline Addresses 21st Century Problems", (February 1999), Address before the American Bar Association, available at http://www.ftc.gov/speeches/pitofsky/hitch.htm

[10] Melamed, "Network Industries and Antitrust", (April 10, 1999), Address before The Federalist Society, available at http://www.usdoj.gov/atr/public/speeches/2428.htm. See also, Robinson "Network Effects in Telecommunications Mergers – The MCI/Worldcom Merger: Protecting the Future of the Internet", (August 23, 1999), Address before the Practising Law Institute of California, available at http://www.usdoj.gov/atr/public/speeches/3889.htm and *US v Microsoft, Findings of Fact*, 84 F. Supp 2d 9 (Dist DC, 1999), at para. 19, 21, 25 (sunk costs) and para. 20 (switching costs).

the move to a new standard will require co-ordination among both the users of the existing network and the suppliers of complements, which is extremely unlikely.[11] Insofar as they facilitate recoupment, the entry barriers that network effects represent make strategies for excluding or weakening rivals more feasible.

Standards enable the realisation of the potential demand-side scale economies of network industries. They can be thought of as the uniform protocols shared by network participants, necessary for *interconnection* with users and *interoperability* with complements.[12] Once a standard exists, software manufacturers will not be able to compete unless their products are compatible with that standard.[13]

COMPETITION IN SOFTWARE MARKETS

The previous section demonstrated that software markets are characterised by network effects. Another feature of software markets is that they involve very high "first-copy" or sunk costs but very low duplication costs, i.e. firms enjoy virtually "instant scalability".[14] This combination of demand-side economies of scale (network effects) and supply-side economies of scale (instant scalability) means that software markets tend to be highly concentrated.

While some commentators have argued that network effects dictate that market power may be transitory, characterised by "serial monopoly", it seems clear that virtuous cycles are hard to stop and start, but relatively easy to maintain: the costs of advancing a standard are far less than the costs of introducing a new standard.[15] In his *Findings of Fact*, Jackson J offers a useful summary of the nature of competition in software markets:

> "In many cases, one of the early entrants into a new software category quickly captures the lion's share of the sales, while other products in the category are either driven out altogether or relegated to niche positions. What eventually displaces the leader is often not competition from another product within the same software category, but rather a technological advance that renders the boundaries

[11] See Balto, "Networks and Exclusivity: Antitrust Analysis to Promote Network Competition", (1999) 7 George Mason Law Rev 523, at 560.

[12] The interface technology underlying the Windows operating system is an example of a software standard: the network extends to all users of Windows-compatible applications. An operating system (OS) controls the allocation of system resources and supports the functions of compatible applications by exposing "application programming interfaces" (APIs). An application that relies on OS-specific APIs will not function on another OS unless it is "ported" to the APIs of that OS: *Findings of Fact, loc. cit.*, at para. 2, 4.

[13] "Exclusion from standardized systems technology is therefore tantamount to exclusion from the market itself": Wagner, "The Keepers of the Gates: Intellectual Property, Antitrust and the Regulatory Implications of Systems Technology", (2000) 51 Hastings Law Journal 1073, at 1097-1098.

[14] *Findings of Fact, loc. cit.*, at para. 38

[15] "What for Microsoft is a positive feedback loop is for would-be competitors a vicious cycle." Jackson J, *Findings of Fact, loc. cit.*, at para. 40. Cass and Hylton observe that "while network effects imply that the probability of successful entry is lower than it would be otherwise, they also imply that the payoff from successful entry is larger than it would be otherwise." "Preserving Monopoly: Economic Analysis, Legal Standards and *Microsoft*", (1999) 8 George Mason Law Rev 1, at 36-37

> defining the category obsolete. These events, in which categories are re-defined and leaders are superseded in the process are spoke of as "inflection points".
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> The exponential growth of the Internet represents an inflection point…[I]t has fuelled the growth of server-based computing, middleware, and open-source software development. Working together, these nascent paradigms could oust the PC operating system from its position as the primary platform for applications development and the main interface between users and their computer."[16]

Obviously, introducing a new standard is not just about "building a better mousetrap": apart from the obvious technical expertise, it also requires marketing and management skills and a range of complementary components.[17] Entrants face an additional obstacle, however: markets characterised by network effects may "tip" (to monopoly) in favour of the product that achieves an early lead.[18] Tipping is driven by consumer expectations, which will be influenced by factors such as a firm's reputation from other markets, its installed base of users and its current products – factors that will tend to favour the

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[16] *Findings of Fact*, *loc. cit.*, at para. 59-60. An "inflection point" is the same as Bresnahan's "epoch" (above). Note also that the "nascent paradigms" of networked computing and middleware (i.e. Navigator-Java) are in "embryonic and primitive form". Microsoft's Appellate Brief identifies as an inflection point the advent of information appliances (TV set-top boxes, handheld devices etc.) and the migration of software to Internet-based services.

[17] Klein, "The Importance of Antitrust Enforcement in the New Economy", (January 29, 1998), Address before the New York State Bar Assn., available at http://www.usdoj.gov/atr/public/speeches/1338.htm. Temple Lang appears to recognise that it is not enough for a new entrant to simply offer 'a better mousetrap': "But it is not innovation as such which constitutes the advantage, and one cannot assume that any innovation is always and automatically an improvement or is better than a competitor's product which has not changed in this particular respect…In the software industry, for example, what seems to be crucial is to have programmers who know how to produce the next product which the market will need or buy." "European Community Antitrust Law – Innovation Markets and High-Technology Industries", (1996 Fordham Corporate Law Institute), *International Antitrust Law and Policy* (1997) 519, at 522.

[18] Whether competing standards can ultimately co-exist depends on the strength of network effects. See Liebowitz and Margolis, "Networks and Standards", *Winners, Losers and Microsoft: Competition and Antitrust in High Techonology* (1999) 87-115. Also, Rubinfeld, "Competition, Innovation, and Antitrust Enforcement in Dynamic Network Industries", (March 24, 1998), Address before the Software Publishers Assn., available at http://www.usdoj.gov/atr/public/speeches/1611.htm. Temple Lang (*loc. cit.*, at 579) has suggested that short product life cycles mean that high technology industries may be characterised by important first mover advantages, and may necessitate interim measures: "In an industry which is changing rapidly, it is sometimes important for the Commission to act quickly, to enable a competitor to enter a market…[A competitor] must be able to show a substantial first mover advantage, so significant that these cases are "it's now or never" cases, to justify interim measures and it must show that the market it wishes to enter is uncompetitive. But it is of course precisely in industries undergoing fast technological change that first mover advantage is likely to be important and easy to prove." Rubinfeld also seems to envisage antitrust intervention in tipping markets, arguing that it is "essential that intervention takes place [before]…expectations in the marketplace have been significantly affected". In contrast, Clapes argues that short product cycles preclude persistent dominance and can place the first mover at a substantial disadvantage in that he will soon face competition from innovators seeking to improve on his technology: "No Monopoly on Innovation: Comments on 'European Community Antitrust Law – Innovation Markets and High-Technology Industries'", (1996 Fordham Corporate Law Institute), *International Antitrust Law and Policy* (1997) 601, at 609-610, 617-618.

incumbent dominant firm.[19] Ultimately, however, the network effects theory is ambiguous in its welfare implications: the socially cost-minimising structure may or may not be very concentrated.[20]

Network effects make compatibility "a critical dimension of [software] industry structure and conduct".[21] In a network market where products are incompatible, the positive feedback operates at the level of each product individually. It has already been noted that consumers' expectations as to sales will influence durable investment decisions such as software purchases. Under incompatibility, because these expectations are based on the sales of the individual firms in the market, they will favour the dominant firm. Compatibility, however, neutralises the dominant firm's current installed base and expected sales as sources of competitive advantage, i.e. it allows the positive feedback to operate at the level of the market as a whole:

> "When different manufacturers' products are compatible, there is one big network, shared by current competitors and entrants. Thus, there is competition within the market in terms of price and product attributes. Because the firms share a network, network effects do not cause tipping of firms' market positions."[22]

The following passage outlines the anti-competitive effects of an incompatibility strategy:

> "By taking control of a standard and making it proprietary [i.e. Windows-specific], Microsoft can design the standard to reduce rather than increase interoperability. By using a standard to reduce or prevent the interoperability of

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[19] Jackson J notes the "chicken-and-egg" problem faced by an entrant: "The overwhelming majority of consumers will use a PC operating system for which there already exists a large and varied set of high-quality full-featured applications". *Findings of Fact*, *loc. cit.*, at para. 30

[20] See Bresnahan, *loc. cit.*, at 160, Rubinfeld, *loc. cit.*, and Melamed, *loc. cit.*: "There is nothing inherently bad about this. If the benefits of the new technology, compared to the existing technology, are not enough to induce consumers to pay the switching costs…then it is not necessarily inefficient for the new technology to fail in the marketplace." This is so even if purchasers *individually* prefer the new (and "better") technology. Also, see Rule, *loc. cit.*: "The logic of the network externalities argument is appealing; however, it is highly questionable whether it has any significant public policy implications, much less any relevance to antitrust enforcement…What succeeds in the market is not always the most technically elegant – success depends on the confluence of consumer taste with a broad array of factors". Shapiro, *loc. cit.*, comments that "it is notoriously difficult for new programs to provide sufficiently great improvements in performance to justify the switching costs users would have to incur to adopt them." Finally, a comment on the *Microsoft* case: "If consumers would have otherwise divided into two groups purchasing incompatible software, 'predatory' conduct that induces them all to buy Microsoft's product will in fact enhance social welfare, since all consumers will benefit from the positive network effects of using a single product…[It has been noted] that a standard-enhancing move in a network market might enhance efficiency on balance, even if it eliminates competition, since consumers of the standard product will benefit from increased adoption of the standard". Lemley and McGowan, "Legal Implications of Network Economic Effects", (1998) 86 California Law Rev 479, at 506

[21] Katz and Shapiro, "Antitrust in Software Markets", in Eisenach and Lenard ed., *op. cit.*, at 33. See also, Economides, "Competition, Compatibility, and Vertical Integration in the Computer Industry", in Eisenach and Lenard ed., *op. cit.*, 209, at 210: "[The] benefits of complementarity can be realized through standardization and interoperability among components." For a discussion on "the role of network effects and incompatible products in creating a [software] monopoly" see Salop and Romaine, *loc. cit.*, at 620-622.

[22] Farrell and Katz, "The Effects of Antitrust and Intellectual Property law on Compatibility and Innovation", (Fall 1998) The Antitrust Bulletin 609, at 611

> Windows with other operating systems, Microsoft could create higher barriers to entry and expansion for rival operating systems because applications programs written to Windows would not work as well on those other platforms or vice versa. Similarly, few applications will be written for these other operating systems. In addition…over time, lack of interoperability with the dominant desktop operating system will become more of a handicap to rival server operating systems. These interoperability problems also apply directly to applications software markets. First, if Microsoft reduces or prevents compatibility and interoperability of rival applications with the Windows operating system, another effect would be to permit Microsoft's own applications to achieve or maintain market power. Users would find that the Microsoft programs work better with Windows…[T]his superior functioning is not due to any inherent advantages of the Microsoft product or superior skill of Microsoft programmers. Rather, it is due to the fact that the rival programmers are denied disclosure of detailed API and source code information available to Microsoft employees that these rivals need to maintain the same high degree of interoperability as the Microsoft products. Second, if Microsoft has market power in applications, it can eliminate interoperability with competing software in order to maintain market power."[23]

Encouraging ongoing, effective competition within an established standard has already been identified as the appropriate goal for competition policy in software markets; it should be now clear that this goal is achieved by maximising compatibility.[24]

Part Two will consider the antitrust treatment of collective standard-setting efforts. Few firms can individually develop and advance a new standard, so concerted action is not

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[23] Salop and Romaine, *loc. cit.*, at 634-635. A dominant firm in a network market will favour a strategy of incompatibility: Katz and Shapiro, "Network Externalities, Competition and Compatibility", (1985) 75 American Econ Rev 424, at 425. Economides has shown that a monopolist in a network market will not want its good to be compatible with that of a new entrant, so as to prevent the entrant benefiting from the network effects of the established good. (Economides, "Durable Goods Monopoly with Network Externalities", available at http://www.stern.nyu.edu/networks/durable.pdf)

[24] US antitrust enforcement agencies have on occasion mandated "open access" as a condition of approving software mergers: see Katz and Shapiro, in Eisenach and Lenard ed., *op. cit.*, at 45-54. In approving the acquisition by leading graphics workstation producer Silicon Graphics (SGI) of Alias Research and Wavefront Techonologies (two of the world's three leading entertainment graphics software companies) the FTC required SGI to enter into a porting agreement with a competitor in the workstation market to ensure that Alias' software was not confined to SGI's own platform, and to publish the APIs for its workstations and OS so as to enable competition in the entertainment graphics software market. (The text of the FTC press release is available at http://www.ftc.gov/opa/1995/9511/sil2g.htm.) Interoperability issues also arose in the acquisition by CAD engine developer Autodesk of CAD application software developer Softdesk. Autodesk's "AutoCAD" had a market share of approximately 70%; Softdesk was within months of producing its own CAD engine ("IntelliCADD"), which would have been competed directly with AutoCAD by allowing for the compatibility and transferability of AutoCAD files and application software. The FTC conditioned approval on the divestiture of the IntelliCADD software. (The text of the FTC press release is available at http://www.ftc.gov/opa/1997/9703/autodesk.htm.) A final example is the AOL/Time Warner merger. Among the conditions imposed by the FTC was a requirement that AOL Time Warner allow competitor ISPs access to its cable systems. The concern was that ownership of the Time Warner cable systems would allow AOL, the dominant narrowband ISP, to extend its dominance into the broadband market. (FTC analysis is available at http://www.ftc.gov/os/2000/12/aolanlaysis.pdf; the final consent order is available at http://www.ftc.gov/os/2000/12/aolando.pdf.)

uncommon. However, collective efforts are desirable from a policy perspective too: by lowering the costs of achieving compatibility, they make compatibility more likely.[25]

II. COLLECTIVE STANDARD SETTING AND COMPATIBILITY

INTRODUCTION: A TALE OF TWO STANDARDS

In the early 1980s, Apollo Computers was the market leader in computer workstations, accounting for slightly over half of total workstation sales in 1984; by 1987, Sun Microsystems, a late entrant, had overtaken Apollo as market leader.[26] Its strategy in doing so is instructive. Competition in workstations revolved around a steady flow of new product introductions. Rather than compete "head on" with Apollo's proprietary standard, Sun built an "open" standard: in doing so, it sacrificed the advantage of locking in its customers to Sun machines, but ensured that other producers would copy the standard it set, thus giving it an enhanced probability of becoming the industry standard.[27] Manufacturing could be outsourced, leaving Sun to focus its limited cash flow on R&D, and avoiding the heavy investments in capital equipment that Apollo had to make. Sun raised funds on the capital markets five times in eighteen months, using these funds to support a price-cutting policy aimed at generating rapid growth in sales. R&D investment ensured a rapid turnover of product generations.

The issue under consideration in this section is how competition policy should approach a concerted effort by a number of firms to introduce a new standard in competition with the established standard of a dominant firm. This will be of particular relevance to computer software markets: "high tech firms are subject to…a greater than average need for horizontal cooperation".[28]

The discussion here will consider coalitions of a more direct nature than Sun's combined strategy of open standards and outsourced manufacturing.[29] The *Microsoft* case presents a

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[25] Katz and Shapiro, "Network Externalities, Competition and Compatibility", *loc. cit.*, at 439

[26] Sutton, "Extensions and Limitations II: Networks and Standards", *Technology and Market Structure: Theory and History* (1998) 379, at 401-407

[27] In December 2000, IBM announced that it would spend more than $1bn backing the Linux operating system – an open system that is Microsoft's chief competitor in the OS market (and, incidentally, a product that is free). *FT.com* (December 12, 2000) described the move as part of IBM's "focus on open systems not tied to proprietary technologies…[and] a way for IBM to unite its own multiple computer platforms with a technology that spans different computer systems".

[28] Clapes, *loc. cit.*, at 627

[29] Referring to the battle between the VHS and Betamax video cassette formats, Sutton, *op. cit.*, at 413, notes that whereas Sony manufactured its Betamax system in-house, JVC chose to share manufacturing with a group of companies. This strategy allowed a high production volume to be reached in a short time and produced a coalition of firms attached to the VHS standard, albeit as licensed manufacturers. The battle between the VHS and Betamax standards usually arises in the context of the debate on "path dependency". A discussion of this phenomenon is outside the scope of this paper: put very simply, one side of the argument is that in network industries, users can get locked in to an inferior standard. See David,

suitable example: the "thin client" initiative, which is supported by Oracle, IBM, Sun and Netscape, offers a standard for networked computing, i.e. the "software as a service" model. The "client" would feature only basic central processing components, key peripherals, an OS and a browser; data would be stored and processed at server-level, to be retrieved by the client as needed.[30] APIs would no longer be OS-specific but would instead be exposed by middleware. If the Java language's promise of "write once, run anywhere" were realised the result would be to erode the "applications barrier to entry" and commoditise the underlying OS.[31]

Recent developments point to a consensus that the future of software lies in web-based services: Microsoft has launched a rival thin client strategy,[32] and Oracle has also entered the online applications market.[33] Sun has branded its software strategy "ONE" ("Open Net Environment").[34] However, while the "big computer firms are now collaborating on standards and competing on implementation", Microsoft's platform somewhat predictably involves its own version of Java, C#: "That threatens a schism. Programmers building web services must choose between Microsoft's .NET and the Java-based way favoured by the rest."[35]

> "[A]lthough the names differ, all of these Microsoft rivals [Sun, IBM, Oracle, Hewlett-Packard] are essentially promoting the same platform, albeit with some minor variations (Oracle with an emphasis on databases, IBM with an emphasis on mainframes and Linux, and so on). The common use of Java and open standards means that their products can be mixed and matched more easily than in the past. It is true that this approach lacks the single-minded focus with which Microsoft is pushing .NET. But with customers increasingly reluctant to commit themselves to a single vendor's vision, that fuzziness may prove to be an advantage."[36]

"Clio and the economics of QWERTY" (1985) 75 Am Econ Rev 332, and Liebowitz and Margolis, "The Fable of the Keys", *op. cit.*, at 19-44.

[30] *Findings of Fact*, *loc. cit.*, at para. 24

[31] *Ibid.*, at para. 29, 32, 73-76. Note that Jackson J identified "significant shortcomings" with the thin client model: "The problems of latency, congestion, asynchrony, and insecurity across a communications network, and contention for limited processing and memory resources at the remote server, can all result in substantial degradation of computing performance." (*Ibid.*, at para. 26)

[32] The ".NET" project is aimed at developing a standard for the online delivery of computing services: Microsoft's Appellate Brief describes the .NET platform as an infrastructure for enabling the provision of services to information appliances. See *The Economist*, "Winternet" (July 1, 2000) 74, and "Round Three" (February 10, 2001) 69. Apparently, however, the experience for Windows users will be "richer" than that for users of rival operating systems ("Winternet"). For a discussion of the possible implications of the .NET strategy for the Microsoft antitrust litigation see *The Economist*, "Microsoft's Cunning plan" (January 6, 2001) 54.

[33] Oracle has developed a competing set of Internet services for businesses: *Wall Street Journal* (December 12, 2000) 16. See also http://www.oracle.com/corporate/press/index.html?613106.html. Note that Oracle plans to offer for free an online service called "VentureNetwork", which will connect entrepreneurs with venture capitalists, legal firms, recruitment agencies etc. The company hopes that the system will generate goodwill and that funded companies will return to Oracle as customers: *Wall Street Journal* (January 16, 2001) 26.

[34] *The Economist*, "Round Three". See also *FT.com*, "Sun Takes on Microsoft's .Net", (February 5, 2001).

[35] *Ibid.*

[36] *Ibid.*

SAFETY IN NUMBERS

> "A joint venture is a particularly attractive device for creating a new network because any single firm may lack the level of demand or potential output to justify the creation of a single network. A joint venture network may overcome the significant transaction costs involved in entering into vertical contracts with its new members, and also enables firms to share the risks of new entry into the network market. In many cases, joint ventures have permitted groups of relatively small competitors to join together and offer a network facility similar to that offered by larger firms."[37]

Whether characterised as a joint venture or considered under s 1 of the Sherman Act or Article 81 EC, it is generally accepted that collective efforts may at times represent the only means of entering a new market. Temple Lang has recognised that "there are some markets in which entry is best done, or can only be done, in some kind of partnership".[38] Computer software markets, as markets with strong network effects, would seem to fit this description. A collective effort to develop and advance a new standard within the computer industry should not be deemed restrictive of competition: the parties involved will not be in competition with regard to the products covered by their agreement.[39] One commentator has argued for a presumption that concerted activity aimed at creating or exploiting innovative intellectual property will not substantially lessen competition, rebuttable on a clear showing that the apparent focus on innovation is a sham or that the ancillary restraints are far more restrictive than is necessary to realise the efficiencies of operation.[40] Consider the early days of handheld computers, which saw alliances between Apple & Sharp, Motorola & Samsung, and Tandy, Casio & Memorex:

> "Notice the number of concerted efforts in this field, some of which involve firms long prominent in personal computers or firms with substantial resources and experience in the information technology industry. Any suggestion that one of these alliances could sustain a supra-competitive price increase or that, collectively, the firms could tacitly agree to a truce on innovational competition would be preposterous. The actual and potential competitors are too numerous, the course of technological change too unpredictable and the consequence of being left behind too drastic."[41]

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[37] Balto, *loc. cit.*, at 524

[38] Temple Lang, "Media, Multimedia, and European Community Antitrust Law", (1997 Fordham Corporate Law Institute), *International Antitrust Law and Policy* (1998) 377, at 441-442. The DOJ and FTC *Guidelines for Collaborations Among Competitors* (April 7, 2000) recognise that "a competitor collaboration may enable firms to offer goods or services that are cheaper, more valuable to consumers, or brought to market faster than would otherwise be possible" (§ 3.36).

[39] See the Commission's *Guidelines on the Applicability of Article 81 EC to Horizontal Cooperation Agreements* (January 6, 2001), at para. 24. Also, at para.98: "Under specific circumstances a cooperation between potential competitors may also raise competition concerns. This is, however, limited to cases where a strong player in one market cooperates with a realistic potential entrant…"

[40] Clapes, *loc. cit.*, at 616-617

[41] *Ibid.*, at 611. Balto refers to the battle over wireless networking standards where one group including 3Com, Lucent, Nokia is competing with another group that includes IBM, Motorola, Proxim. (The second

The DOJ's treatment of the MPEG-2 patent pooling arrangement is instructive.[42] Participants proposed to pool 27 patents held by numerous different patentees and to issue blanket, non-exclusive licences. Note that the pool involved complementary, not competing, technologies, i.e. the patents could be considered as components of a single technology, or standard. The DOJ decided not to initiate an enforcement action. Nevertheless, the case illustrates the appropriate points upon which any analysis of collective standard-setting efforts should focus: *exclusion* (rules restricting membership of the group) and *exclusivity* (rules restricting member firms' freedom to deal with non-members). The MPEG-2 pool promised equal access, so there was no potential for exclusion that would disadvantage the members' rivals. Nor did issues of exclusivity arise: the licenses were non-exclusive, so each patent would remain available on an individual basis from its licensor; and the licensors were free to develop alternative technologies, so unilateral competition with the standard was permitted.[43] In the same way, the German Bundeskartellamt approved the *Covisint* venture (a B2B exchange for the auto-industry) on the grounds that open and non-discriminatory access would be available to all parties and exclusivity would not be required.[44]

EXCLUSIONARY RULES

While competition authorities may accept that standards agreements do not necessarily restrict competition, exclusionary rules (i.e. provisions governing admission and access) will nevertheless tend to attract antitrust scrutiny.[45] Essentially, admission to a (standard-setting) group must be governed by objective and precise rules, applied in a uniform, non-discriminatory manner. However, a group does not have to be open "to all companies, or to all companies which meet its membership criteria… Its membership criteria must be written so as to achieve the economies of scale or other advantages sought, but not to make possible unnecessary anti-competitive effects."[46]

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group is supporting a standard which is less expensive but slower.) "Standard Setting in a Network Economy", (February 17, 2000), Address before the Cutting Edge Antitrust Law Seminars International, available at http://www.ftc.gov/speeches/other/standardsetting.htm

[42] MPEG-2 is a standard for video data compression. The DOJ's business review letter is available at http://www.usdoj.gov/atr/public/busreview/1170.htm.

[43] See also the Commission's *Guidelines on Horizontal Cooperation Agreements* (January 6, 2001), at para. 167: "The existence of a restriction of competition in standardisation agreements depends upon the extent to which the parties remain free to develop alternative standards or products that do not comply with the agreed standard."

[44] Available at http://www.bundeskartellamt.de/26.09.2000_englisch.html (September 26, 2000). The FTC expressed some concern over the market share of the participants: General Motors, Ford, DaimlerChrysler, Renault and Nissan. (FTC Press Release available at http://www.ftc.gov/opa/2000/09/covisint.htm.) The Bundeskartellamt was satisfied that Covisint would face competition from a number of B2B exchanges (presumably because the absence of an exclusivity requirement would allow competing platforms to flourish).

[45] Temple Lang, (1996 Fordham Corporate Law Institute), *loc. cit.*, at 567-69. See *IGR Stereo Television-Salora* 11th Report on Competition Policy (1981) p.63-64, *EBU/Eurovision System* OJ L.179/23 (1993), Joined Cases T-528/93, 542/93, 543/93, 546/93 *Métropole Télévision S.A. v Commission* [1996] 5 CMLR 386.

[46] Temple Lang, *loc. cit.*, at 529. Also, *ibid.*, at 571: "Access on non-discriminatory terms may of course involve the competitor complying with certain criteria or requirements or making an appropriate

Pitofsky has argued that there should be no mandatory access unless it is indispensable to effective competition: mandating access to latecomers may appear to reward "the passive and less energetic at the expense of those who pioneered a field".[47] He also notes that *Associated Press*[48] supports a more aggressive approach, requiring access "even where the network confers only a significant competitive advantage and there was no good business reason to exclude".[49] However, it is arguable that *Associated Press* was wrongly decided.[50] The dissenting judgements argue that the admission restrictions merely reflected the value ascribed to the efficiency arising from exclusivity, i.e. that a firm will only pay for an exclusive right if it obtains some competitive advantage. This is more convincing: if a group of firms that has established a valuable network is compelled to share that property with every newcomer there will be no incentive for investment in the network.[51]

It has been argued that as long as there is healthy innovation competition, a period of "significant profitability differential" for the innovators/members is desirable because it encourages future innovation.[52] And the EU Commission appears to accept that it may be necessary to allow the members of a group to realise a competitive advantage in order to achieve long run innovation competition.[53] Ultimately, however, what is required is a showing that the challenged exclusionary rules are necessary for or contribute to the group's efficiency, i.e. that there is some reasonable connection between the restrictions and the claimed benefits.

EXCLUSIVITY RULES

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contribution to the joint operations: there is never a duty to provide better terms to non-parties than to parties. It is also relevant to know whether the parties could share with competitors the same services on the same terms without lessening the benefits of the arrangement to themselves…The duty to grant access arises only if without it the market would not be competitive…". See also the Commission's *Guidelines on Horizontal Cooperation Agreements* (January 6 2001), at para. 172, and the DOJ/FTC *1995 Antitrust Guidelines for the Licensing of Intellectual Property*, 34 ILM 1115, at 1145-1146.

[47] Pitofsky, *loc. cit.* In this context, "indispensable" should be understood as technically essential, as opposed to commercially essential. Balto refers to the FTC Staff Report, "Anticipating the 21st Century: Competition Policy in the New High-Tech, Global Marketplace", (May 1996), Chapter 9, at 4-5: "mandatory access may have the drawback of interfering with the smooth functioning of a network joint venture by introducing coordination problems among unfriendly rivals". "Standard Setting in a Network Economy", *loc. cit.*, at footnote 32.

[48] *Associated Press v United States* 326 US 1 (1945)

[49] Pitofsky, *loc. cit.*

[50] The majority argued that the First Amendment dictated that public welfare depends on the widest possible dissemination of information, and that private combinations such as AP could not impose restraints on that freedom.

[51] Balto, (1999) 7 George Mason Law Rev 523, at 543

[52] Clapes, *loc. cit.*, at 604

[53] *X/Open Group* OJ L.35/36 (1987), *Optical Fibres* OJ L.236/30 (1998). Note, however, that it will be in the group's interest to achieve the greatest possible "diffusion" of its standard, so it will generally by prepared to grant access widely and equally. (Consider the example of the MPEG-2 patent pooling arrangement discussed above.) It has been said that the goal of creating a common, widely adopted standard "forces the IPR owner to ask only modest fees and generally will lead to non-discriminatory and fair licensing conditions": Bekkers and Liotard, "European Standards for Mobile Communications" [1999] EIPR 110, at 117.

With regard to exclusivity provisions, there is some support for the view that, insofar as it enables standards competition, network exclusivity can be particularly pro-competitive. In *National Bank of Canada v Interbank Card Association*[54] a MasterCard bank merged with a VISA bank, prompting MasterCard to invoke its exclusivity rule and require the bank to withdraw from either the MasterCard or VISA network. The exclusivity rule was upheld as necessary to protect the original members' investment in the venture and its underlying purpose was "to enhance competition in the Canadian credit card market by introducing a new product".[55] Balto notes that as a result of this distinct membership, network competition between MasterCard and VISA is "far more vibrant" in Canada than in the United States.[56] Approving the *MyAircraft.com* joint venture proposal, the Commission upheld a number of restraints imposed to prevent the parties from engaging in "activities relating to competing internet platforms in the aerospace sector".[57] The restraints, which were limited in duration, were deemed "necessary to ensure that the joint venture [was] established on a solid base".[58]

THE BIGGER PICTURE

It should be recognised that, within a network industry, cooperation between competitors will often facilitate a form of "virtual" vertical integration: the issues will be similar to those involved in the analysis of vertical restraints.[59] These issues could therefore be analysed under something akin to a dynamic rule-of-reason.[60] So, while various restrictions may be necessary to enable the group or joint venture enter the market and engage in standards competition, once the standard is established the argument for restricting access is far less compelling: a "dynamic compatibility regime".[61]

The collective efforts themselves can be seen to have pro-competitive effects that extend beyond the successful adoption of a new technology. Reference has already been made to the desirability of compatibility in network markets:[62] it allows for increased entry and variety, and greater price and innovation competition, i.e. it enables ongoing competition *within* a market rather than once-off (albeit fierce) competition *for* a market.[63] So while

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[54] 507 F. Supp. 1113 (S.D.N.Y. 1980)
[55] *Loc. cit.*, at 1123
[56] Balto, *loc. cit.*, at 538
[57] M.1969 *UTC/Honeywell/i2/MyAircraft.com*, (August 4 2000), at para. 22-24
[58] *Ibid.*, at para. 24
[59] Carlton and Salop, "You Keep on Knocking But You Can't Come In: Evaluating Restrictions on Access to Input Joint Ventures", (1996) 9 Harvard Journal of Law and Technology 319. DeSanti notes that cooperation among competitors to establish a B2B e-marketplace will typically involve "an efficiency-enhancing integration [that] may be accomplished by contract – that is, the integration of assets takes place not in physical space but 'virtually'". DeSanti, "The Evolution of Electronic B2B Marketplaces", Address before the FTC Public Workshop: *Competition Policy in the World of B2B Electronic Marketplaces*, (June 29 2000), available at http://www.ftc.gov/bc/b2b/b2bdesanti.htm
[60] Carlton and Salop, *loc. cit.*
[61] Consider, for example, the Commission's treatment of the *MyAircraft.com* joint venture proposal.
[62] See footnote 21 and associated text.
[63] Katz and Shapiro, in Eisenach and Lenard ed., *op. cit.*, at 54-58. See also DeSanti, *loc. cit.*: "Perhaps network effects dictate that only a few marketplaces dominate the [B2B] industry. It is also possible, however, that…efficient, competing e-marketplaces may thrive given adequate interoperability."

efficiency may, in some cases, be greatest where there is only one network, "[i]f variety can still flourish within the standard, the outcome can be very efficient and preserve considerable competition even while exploiting network effects".[64] And the very nature of collective standard-setting efforts means that compatibility is inherently more likely: a number of firms will control the direction of a standard, enjoying quality access to the relevant technical information. This will go some way to ensuring that "variety can still flourish" within a standard.

III. THE MICROSOFT CASE

INTRODUCTION

It is submitted that analysis of the issues in *Microsoft*[65] is properly based on one broad antitrust issue: Microsoft's investment in "enlisting other firms in its campaign to increase Internet Explorer's usage share at Navigator's expense…[which] was only profitable to the extent that it protected the applications barrier to entry".[66] It seems clear that the strategies of pricing Internet Explorer (IE) at zero, bundling IE and Windows, and entering into exclusive arrangements with Original Equipment Manufacturers (OEMs) and Internet Service Providers (ISPs) were aimed at maximising Microsoft's browser market share at the expense of Netscape. But antitrust analysis in the case thus far suffers from a fatal problem of characterisation. Jackson J portrays IE's zero-price as predatory pricing, the bundling of IE and Windows as an illegal tie-in, and the arrangements with OEMs and ISPs as instances of exclusive dealing; as an inevitable result of these characterisations, the arguments advanced under each claim are weak.[67]

NO SUCH THING AS A FREE BROWSER?

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[64] Katz and Shapiro, *loc. cit.*, at 58

[65] *United States v Microsoft Corporation*: Findings of Fact, 84 F. Supp. 2d 9 (DDC 1999), available at http://www.microsoft.com/presspass/trial/c-fof/default.asp; Conclusions of Law, 87 F. Supp. 2d 30 (DDC 2000), available at http://www.microsoft.com/presspass/trial/col/default.asp; Final Judgment, 97 F. Supp. 2d 59 (DDC 2000), available at http://www.microsoft.com/presspass/trial/remedies/default.asp; Microsoft's Appellate Brief, available at http://www.microsoft.com/presspass/trial/appeals/default.asp

[66] *Findings of Fact*, *loc. cit.*, at para. 141

[67] Following the two-day oral hearing before the appeals court it now seems unlikely that Microsoft will be broken up (transcripts available at www.microsoft.com/presspass/trial/transcripts/default.asp). At the morning session on February 26, 2001, the Court questioned the basis of the DOJ's theory of liability (that Microsoft acted to crush the competitive threat presented by Navigator-Java). If Navigator-Java is properly considered a potential competitor of Windows, then the relevant market would be the market for software platforms or standards, not the market for PC operating systems. If, however, the market was correctly defined as the OS market (and here, the judges made much of the fact that Netscape did not see itself as a substitute for Windows), then there is no causal connection between Microsoft's conduct and the maintenance of its monopoly power. See also, *The Economist*, "Judging the Judge" (March 3, 2001) 62-63.

Characterising Microsoft's zero-pricing of IE as predatory pricing is bound to fail, simply because there are plausible justifications for a zero price. Consider the difficulties Microsoft faced as an entrant to the browser market: Navigator "already enjoyed a very large installed base and had become nearly synonymous with the Web in public consciousness".[68] It could be argued that the zero-price was an instance of penetration pricing necessary to overcome the enormous barriers to entry represented by the network effects working in Netscape's favour. Alternatively, as the marginal cost of producing an extra unit of a software product is zero, it could be argued that a rational firm can be expected to set price at marginal cost.[69] A zero price for IE could also be explained by analogy to the supply of free programming on broadcast TV, in which case the browser's ability to generate advertising revenues and commissions by steering Internet users to particular web-sites makes the marginal cost of distributing another unit negative.[70]

DID BILL GATES TWIST YOUR ARM?

To establish an illegal tie-in, Jackson J had to identify two separate products. So, he argues that "the commercial reality is that consumers today perceive operating systems and browsers as 'separate products', for which there is separate demand."[71] But Microsoft's response is more convincing: the application of the "separate consumer demand" test would "kill innovation to the detriment of consumers by preventing firms from integrating into their products new functionality previously provided by standalone products – and hence, by definition, subject to separate consumer demand".[72]

The other element of an illegal tie-in is "forcing", and the argument here is equally problematic. Consumers were simply not compelled to purchase a product they did not want: they were not charged anything for Internet Explorer and they remained free to install Navigator as their default browser:

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[68] Jackson J, *ibid.*, at para. 137. At that time, Navigator's market share was approximately 80%.

[69] The Coase Theorem may explain the zero-price bundling of IE: Windows is a durable good, so Microsoft can be expected to innovate by adding functionality to its OS (in the form of web-browsing capability) so as to maintain demand. Note that Jackson J appears to acknowledge that a policy of charging for IE would only "temporarily" enhance consumer demand for Windows. (*Ibid.*, at para. 139)

[70] Klein B., "Microsoft's Use of Zero-Price Bundling to Fight the 'Browser Wars'", in Eisenach & Lenard ed., *op. cit.*, 217, at 223-225

[71] *Conclusions of Law, loc. cit.* Consider Bork's comments on the judicial assessment of whether two separate products have been tied: "There is no way to state the 'inherent' scope of a product. The judge who attempts it either decides according to product dimensions that seem to him natural because he is accustomed to them, or explicitly decides on grounds of efficiency. An automobile and a can of pears are perceived as single products because it would be too expensive to require the seller to subdivide them further. *Economies of scale determine the definition of product.*" Bork, *op. cit.*, at 379 (emphasis added). Posner and Easterbrook have suggested "that two items are a single 'product' if there are economies in joint production or sale" (quoted in Lopatka and Page, "Antitrust on Internet Time: *Microsoft* and the Law and Economics of Exclusion", (1999) 7 U Chic Sup Ct Econ Rev 157, at 196-197).

[72] Microsoft's Appellate Brief, *loc. cit.*, at 69. The Court of Appeals was not convinced that Windows and IE were separate products (*loc. cit.*, afternoon session, February 26, 2001). Lopatka and Page (*loc. cit.*, at 164) have argued that the "focus on separate demand does not address the most important efficiency concerns in cases involving [integration]". It was accepted in *Multistate Legal Studies v Harcourt Brace Jovanovich Legal and Professional Publications* 63 F. 3d 1540 (1995 10th Cir.) that product improvements may be the *cause* (or effect) of changes in demand: presumably, this would allow innovation by integration within the "consumer demand" test where there was *subsequent* demand for the integrated product.

> "Thus, the tie of IE and Windows does not cause anticompetitive exclusion in the usual way, by forcing buyers to accept a product that they do not want in place of a product that they do want, because it imposes no financial or technical obstacle to using both [IE and Navigator]."[73]

Jackson J's argument that hard-drive space is "scarce and valuable" is difficult to accept,[74] and the fact that IE was zero-priced when it was sold *separately* casts aspersions on his claim that "any value to be ascribed to Internet Explorer is built into [the] single [Windows] price".[75] The technical integration of the browser and OS in Windows 98[76] is properly characterised and considered as an instance of raising rivals' costs through contrived incompatibility, but characterising it as a technological tie, Jackson J strains to find the requisite consumer harm:

> "To the extent that browser-specific routines have been commingled with operating system routines to a greater degree than is necessary to provide any consumer benefit, Microsoft has unjustifiably jeopardised the stability and security of the operating system. Specifically, it has increased the likelihood that a browser crash will cause the entire system to crash and made it easier for malicious viruses that penetrate the system via Internet Explorer to infect non-browsing parts of the system."[77]

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[73] Lopatka and Page, *loc. cit.*, at 209. Note also that the Court of Appeals, *loc. cit.*, seemed to support this argument. While purely voluntary ties foreclose competitors, there is no antitrust issue as "the competing sellers deserve no protection against a wholly uninhibited buyer's choice": Turner, (1958) 72 Harv. Law Rev. 50, at 61, quoted in Meese, "Tying Meets the New Institutional Economics: Farewell to the Chimera of Forcing", (1997) 146 U Penn. Law Rev 1, at 94. Note that in his *Conclusions of Law*, Jackson J argues that *Fortner v US Steel* (1969) 394 US 495, at 512-514, and *Jefferson Parish Hospital v Hyde* (1984) 466 US 2, at 12-13, are authority for the proposition that the forcing inquiry (in a tying analysis) seeks to expose "those product bundles that raise the cost or difficulty of doing business for would-be competitors to prohibitively high levels, thereby depriving consumers of the opportunity to evaluate a competing product on its relative merits". This is confusing: Jackson J seems to describe an RRC-strategy rather than an instance of forcing. Meese interprets *Jefferson Parish* as meaning that the requirement of forcing is satisfied once market power has been established, and *Eastman Kodak v Image Technical Services* as meaning that where consumers are "locked-in", the market power requirement is met: "If so, the decision would signal a retreat by the Court to the pre-*Jefferson Parish* days, when trademarks or copyrights – even the existence of the tie itself – were deemed presumptive evidence of such market power." Meese, *loc. cit.*, at 34-44. Under such an approach, forcing could be established without difficulty, although it should be noted that Meese's analysis of forcing leads him to this conclusion (*ibid.*, at 99): "Because ties can arise without any exercise of market power, the mere presence of a tie, even when coupled with the existence of market power, does not logically give rise to a presumption that forcing is present." Indeed, Meese argues for a rethinking of tying theory based on the recognition that ties can be methods for overcoming market failure, e.g. by minimising transaction costs through partial integration.

[74] *Findings of Fact*, *loc. cit.*, at para. 159. See also Lopatka and Page, *loc. cit.*, at 213.

[75] *Conclusions of Law*, *loc. cit.* And *Multistate Legal Studies* is authority for the proposition that where the "tied" product is offered free there is no separate tied purchase: see p.17 of the judgement.

[76] *Findings of Fact*, *loc. cit.*, at para. 173. This is achieved by placing IE-specific code through various OS-specific files: the Windows 98 interface is displayed using HTML; the "Help" system and the "Windows Update" feature also depend on IE-specific code.

[77] *Ibid.*, at para. 174

Judge Jackson's tying analysis is deeply unsatisfying.[78]

COMPAQ'S SELF-TWISTING ARM

In his *Findings of Fact* Jackson J devotes considerable space to the contractual restrictions imposed on OEMs preventing them from removing Internet Explorer from Windows. In reality, these restrictions may have been nothing more than the result of bargaining between industry players.[79] Microsoft imposed certain restrictions on OEMs' ability to reconfigure the desktop and the start-up sequence, but the explanation that this was in order to ensure a common "Windows experience" for all users seems plausible.[80] And OEMs were granted discounts off their Windows royalty prices to encourage compliance.[81] Rather than regarding this as the normal *quid pro quo* of contractual negotiations, Jackson J seems to see the OEM-restrictions and the discounts as evidence of a predatory intent:

> "Microsoft was willing to sacrifice some goodwill and some of the value that OEMs attached to Windows in order to exclude Navigator from the crucial distribution channel. Microsoft's restrictions succeeded in raising the costs to OEMs of pre-installing and promoting Navigator. These increased costs, in turn, were in some cases significant enough to deter OEMs from pre-installing Navigator altogether."[82]

This misses the point completely. OEMs' costs were not raised: they were compensated for the costs of complying with the restrictions – and they could still pre-install Navigator:

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[78] In any case, it should be noted that if prices in the market for the tied product remain competitive (i.e. at MC, or zero) it becomes difficult to identify harm to consumer welfare, making it hard to justify intervention. Note also that by late 1998, Microsoft's IE had a market share of approximately 45-50%; Navigator's share had fallen from approximately 80% in 1996 to the "mid 50% range" in July 1998 (AOL figures, *Ibid.*, at para. 360).

[79] *Ibid.*, at para. 205-208, 213-220. Noting that the restrictions imposed on OEMs by Microsoft were considerably greater than those imposed by Apple and IBM (rival OS vendors), Jackson J states that the reason for this is that Apple and IBM did not share Microsoft's anti-competitive motivations (*ibid.*, at para. 229). A more plausible explanation is that the difference merely reflects the relative bargaining strengths of the three OS vendors.

[80] Difficulties in "finger-pointing" mean that users could associate a slow, over-elaborate start-up sequence with Microsoft, not with the OEM that devised it (*ibid.*, at para. 223-225). Bork argues: "If consumers prefer the Netscape platform to the Windows platform, computer manufacturers will configure their machines so that the first screen to appear is that generated by Netscape's browser. If a significant number of computers had the Netscape first screen, software developers would write programs for it, and competition would flourish in the operating systems market. Microsoft's first screen restriction squelches that. This effectively blocks Netscape from the most important channel for getting its browser to consumers." "The Case Against Microsoft", available at http://www.procompetition.org/research/bork.html. This is nothing short of ridiculous: Bork ignores the fact that OEMs were free to feature Navigator on the Windows desktop and to make it the default browser; he also seems to disregard the fact that the Navigator-Java standard is not yet established.

[81] *Findings of Fact*, *loc. cit.*, at para. 215, 231

[82] *Ibid.*, at para. 216

> "Microsoft's license agreements have never prohibited OEMs from pre-installing programs, including Navigator, on their PCs and placing icons and folders for those programs on the Windows desktop and in the "Start" menu…Microsoft leaves enough space for an OEM to add more than forty icons to the Windows desktop."[83]

The following example from the *Findings of Fact* clearly demonstrates that Microsoft's arrangements with OEMs involved inducement rather than coercion.[84] In early 1996, Compaq partnered with Netscape: Netscape seems to have offered Compaq a discount for an exclusive slot on the desktop.[85] Insofar as the inclusion of Internet Explorer eliminated this ability to sell an exclusive to Netscape, its equilibrium price to OEMs was negative; and, as Netscape's product was significantly superior at that time, Microsoft would have had to make a very large positive payment (or reduce the OS price) to compensate OEMs such as Compaq. Arguably, it was more economic to engage in a short-term opportunistic contractual "hold-up", whereby Microsoft enforced the provisions of its OEM licensing contracts and prohibited OEMs from removing any part of the Windows OS.[86] This prevented Compaq from selling its "browser slot" to Netscape on an exclusive basis, but while it would have had short-run wealth distribution effects it was not of any competitive significance: there was no harm to consumers, nor was there any anti-competitive exclusionary effect on Netscape – OEMs could still install Navigator and make it the default browser.[87] In February 1997, Compaq aligned itself with Microsoft; it benefited from lower Windows license fees and a bounty for each Compaq user that signed up for Internet access, i.e. the new licence took account of the impact of the growth of the Internet on the value of the browser slots on the desktop.

Jackson J describes Microsoft's purchase of Compaq's partnership as a "massive and multifarious" investment, but a more plausible portrayal would be that of a bargain agreed

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[83] *Ibid.*, at para. 217

[84] Klein B., *loc. cit.*, at 239-245

[85] See *Findings of Fact*, *loc. cit.*, at para. 232-235, 240. Charles Rule, *loc. cit.*, observed that "it appears that the OEMs who allegedly wanted to remove IE from the desktop wanted to do so in order to give the Navigator icon an 'exclusive' on the desktop". He continued: "This is the first time I can recall the Department of Justice taking an enforcement action against one company with a smaller share (in Microsoft's case, less than 40 percent) in order to protect the ability of a dominant competitor (in this case Netscape with more than a 60 percent share) to secure an exclusive."

[86] Klein, *loc. cit.*, at 241-242, also notes the likely negative precedential effect of allowing an OEM to modify the OS in advance of licence renegotiations – the Windows licences were short-term agreements.

[87] Klein, *ibid.*, at 237-239, has argued that Netscape's market share did not decrease significantly when Microsoft began bundling its browser in August 1995: by April 1996 its market share had risen to only 4%. And in August 1996, three months after the introduction of a much-improved version of Internet Explorer, Microsoft's market share was still only 8%. From that point, however, it increased significantly, i.e. Netscape's share substantially declined only after Microsoft had made massive R&D investment and produced a superior product. So, from 1995 to early 1996, the bundling worked to prevent Netscape from foreclosing Microsoft's browser from OEM desktops while Microsoft improved its technology. Lopatka and Page describe the restrictions imposed on OEMs as "a struggle having to do with the distribution of wealth, not efficiency" (*loc. cit.*, at 229). Microsoft's Appellate Brief, *loc. cit.*, at 45-48, refers to due diligence documents prepared by AOL's investment bankers which reported that Navigator was present on "22% of all OEM shipments with minimal promotion" and that Netscape paid no compensation for OEM distribution. Navigator also had a "24% share of top 20 ISP's distribution" and was the default browser on all Regional Bell Operating Company and Earthlink distributions.

upon by two sophisticated firms. Note that in January 1999, after Netscape agreed to provide it with approximately $700,000 of free advertising, Compaq resumed pre-installation of Navigator on its Presario computers.[88]

In the same way, a critical reading of Microsoft's dealings with ISPs suggests a pattern of inducement, not coercion.[89] Microsoft's Appellate Brief notes the difficulties faced by the entrant to the browser market:

> "By 1995, Netscape had formed relationships with almost all of the major ISPs, and many ISPs featured Navigator exclusively. In fact, in early 1996, no major ISP in the United States distributed IE, and few even supported IE on their service. Microsoft had difficulty persuading ISPs to distribute IE because of their existing arrangements with Netscape."[90]

It is perhaps not surprising that Jackson J's attempt to attribute some anti-competitive quality to Microsoft's dealings with AOL instead suggests that those dealings were nothing more than "bargained-for exchanges of consideration":[91]

> "In essence, AOL contravened its natural inclination to respond to consumer demand in order to obtain the full technology, close technical support, and desktop placement offered by Microsoft."[92]

And there appears to be a tacit acceptance that the antitrust concern is not the OEM exclusives but rather the issue of technical integration:

> "Although the Windows 98 OEM license does not forbid the OEM to set Navigator as the default browsing software, doing so would fail to forestall user confusion since…Windows 98 launches Internet Explorer in certain situations even if Navigator is set as the default."[93]

This is important: Katz and Shapiro have suggested that competition policy should distinguish between the release of a "bundled" browser at a low or zero incremental price and instances where a dominant firm imposes incremental costs on the developers or

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[88] *Findings of Fact, loc. cit.*, at para. 240
[89] *Ibid.*, at para. 242-310
[90] Appellate Brief, *loc. cit.*, at 32
[91] Lopatka and Page, *loc. cit.*, at 222
[92] *Findings of Fact, loc. cit.*, at para. 294. Note that whereas Netscape refused to allow its ISP licensees to move Navigator's default home page from Netscape's own portal, Microsoft allowed each ISP to pre-set the default home page (*ibid.*, at para. 248-249). AOL acquired Netscape in November 1998; as part of a three-year strategic alliance with Sun Microsystems, it has agreed to promote Java technologies for use on the Internet. It has also announced its intention to replace IE with Navigator in its classic online service as soon as contractually possible (early 2001). Microsoft's Appellate Brief claims that AOL controls one-third of all IE users; with 26 million subscribers, it has been described as "the de facto Internet operating system for mass-market America": *Fortune*, "AOL's Grand Unified Theory of the Media Cosmos" (January 8, 2001) 32-38, at 37. See also Lopatka and Page, *loc. cit.*, at 161 (footnotes 9,10 and associated text).
[93] *Findings of Fact, loc. cit.*, at para. 217

users of rival browsers. Intervention can be justified in the second case.[94] This approach leads to the following characterisation of the potential antitrust issues in Microsoft:

- Microsoft's OEM/ISP exclusives may have disrupted optimal distribution patterns in the browser market, artificially raising the price Netscape would have to pay to secure distribution through those channels;[95]
- Microsoft may have withheld Windows interface information from rivals;
- Microsoft may have disadvantaged rivals by engineering incompatibility into its OS.

This characterisation sits better with the factual background to the case. The "disruptive technology" of the Navigator-Java platform threatened to lower the barriers to entry in the OS market by allowing for cross-platform compatibility. Consumers would no longer have to take into account the number of applications expected to become available for a specific OS and developers would no longer have to consider which OS would become the standard among consumers. As a monopolist in the OS market, Microsoft had a clear incentive to prevent this cross-platform compatibility. The "browser wars" were just one element of a broader strategy aimed at preserving the OS monopoly by impeding the adoption of Navigator-Java. So, Microsoft competed head-on with Netscape in the browser market, it made Sun's Java language incompatible with aspects of Windows and it promoted a rival, Windows-specific, version of Java. The imposition of artificially higher distribution costs, the denial of quality access to necessary interface information, and engineering incompatibility with rivals' products are instances of dominant firm conduct best analysed under the theory of "Raising Rivals' Costs".

RAISING RIVALS' COSTS

"Raising Rivals' Costs" (RRC) is the exclusionary exercise of market power to raise or maintain prices above the competitive level: it involves conduct that raises costs and induces rivals to restrict their output. Claims of anti-competitive practices can be analysed according to whether they place rivals at a cost disadvantage sufficient to allow the defendant firm to exercise monopoly power by increasing price.[96] It is better to compete against high-cost firms than low-cost ones, so an RRC strategy can be profitable without the rival's exit from the market. And the recoupment problem is avoided: a higher-cost rival will quickly reduce output, allowing the predator to raise price or market share. Nor do RRC strategies require a "deeper pocket": unlike predatory pricing (where the predator can be expected to lose money in the short run faster than its smaller victim)

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[94] Katz and Shapiro, "Antitrust in Software Markets", in Eisenach and Lenard ed., *op. cit.*, at 75. This is similar to asking whether, on balance, consumer welfare has been harmed: a strategy that does not raise demand, and yet raises cost and price, will lower consumer welfare. (If demand rises, however, it may balance the increases in cost and price). See Salop and Scheffman, "Raising Rivals' Costs", 1983 73 Am Econ Rev 267.

[95] Jackson J identified the primary browser distribution channels as pre-installation by OEMs and bundling with the proprietary client software of ISPs (*Findings of Fact*, *loc. cit.*, at para. 144).

[96] Krattenmaker and Salop, "Anticompetitive Exclusion: Raising Rivals' Costs to Achieve Power over Price", (1986) 96 Yale Law Journal 209, at 214. The authors also argue that RRC theory allows the application of a single set of standards to the analysis of "a wide range of superficially disparate antitrust claims", *ibid.*, at 229. See also Salop and Scheffman, *loc. cit.*

the dominant firm's smaller rivals will bear the costs disproportionately. Finally, cost-increasing strategies can often be made irreversible. For these reasons, RRC is a more credible strategy than predatory pricing.[97]

Microsoft's use of "per-processor" Windows' licences (the subject of the 1995 consent decree) is a helpful example of an RRC-strategy. Under a per-processor contract, an OEM paid Microsoft a fee for each sale of a computer system that used a designated microprocessor whether or not the system was sold with Windows. It has been shown that this forces the vendor of a rival OS to offer a contract with a zero marginal cost, i.e. a fixed-price contract, in order to compete with Microsoft on a level playing field.[98] This effectively amounts to a raising of rivals' costs; a simplified version is outlined below.

- Let *u* represent the value that an OEM places on Windows (as measured by the price it can command for a Windows-equipped system)
- If *p* represents the per-processor fee, the net value to an OEM of selling a Windows-equipped computer is: $u - p$

- Let *v* represent the value that an OEM places on a rival OS
- Let *p2* represent the per-unit price of a rival OS
- Where the OEM must pay a per-processor fee to Microsoft (represented by *p*), the net value of selling a computer with the rival OS is: $v - p - p2$

Contracts with input suppliers, whereby the suppliers refuse to deal with rivals or deal only on discriminatory terms, can be effective means of implementing RRC strategies.[99] And the same is true of contracts with distributors: by disrupting optimal distribution patterns, a dominant firm can impose costs on its rivals. For example, Microsoft's exclusive arrangements with OEMs and ISPs may have raised Netscape's costs of distribution or reduced the size of its installed base of users, thereby raising its marginal costs across the board.

It could be countered that Netscape had equally effective counter-strategies available to it, but once a firm is forced to pay *not* to be excluded its costs have already been raised. In any case, the fact that a predator outbids its rivals for the purchase of exclusive rights does not mean that the exclusion is economically efficient: the market for exclusionary rights is a market for competition, which is a classic public good. So, even a well-functioning market will fail to yield an efficient outcome.[100] The incentives each party

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[97] Bork's analysis of predatory pricing leads him to the same conclusion, i.e. competition policy should look for methods of predation which do not require the predator to expand output thereby incurring disproportionately large losses. *Op. cit.*, at 148

[98] MacKie-Mason and Metzler, "Links Between Vertically Related Markets: *Kodak*", in Kwoka and White ed., *The Antitrust Revolution: Economics, Competition and Policy* (1999) 386, at 416-418. This reduces the rival's long-run incentives to invest.

[99] This will be so where there are entry barriers into input production, and where the next-best alternatives are less cost-effective. See Krattenmaker and Salop, *loc. cit.*, at 233-253, and Krattenmaker and Salop, "Competition and Cooperation in the Market for Exclusive Rights", (1986) 76 Am Econ Rev Vol.2 109, at 109.

[100] This is so because third parties who are not involved in the bidding, i.e. consumers, will receive many of the benefits from the non-exclusion of rivals. Krattenmaker and Salop, *loc. cit.*, at 110

faces suggest that this type of RRC strategy may be particularly effective: while the purchaser of the exclusive rights stands to gain increased market power and additional profits, the potentially excluded rivals only gain the more-competitive non-exclusion price and profits. If, however, the rivals reduce their output, they gain the benefit of a higher price on their remaining sales: essentially, the purchaser has more to gain than the rivals have to lose.[101]

"Technological" input foreclosure by a dominant firm controlling a software standard such as Windows represents a more interesting RRC strategy. Rivals could be denied quality access to important inputs such as the interface information necessary to produce interoperable products. It is clear that Microsoft's control of the Windows OS gives it considerable power to raise rivals' costs in this way.[102] "Contrived incompatibility" represents another, perhaps more subtle, form of technological input foreclosure, and it seems that efforts were made to make running another browser on Windows 98 a "jolting experience".[103] Note also that technological input foreclosure does not require the deep pockets necessary to purchase exclusive rights from distributors:

> "If Microsoft were to configure Windows so that Navigator would not run on it, Netscape would likely be driven from the browser market. Microsoft could profit

[101] The relative gains and losses will depend on the firms' market shares, so the strategy is likely to succeed when the predator is big and its rivals are small. Also, strategies that inflict less harm on rivals relative to the benefits to the predator are more likely to succeed as the rivals will be willing to bid less to prevent the exclusion. And, as with any predatory strategy, there must be barriers preventing new entry and preventing rivals from expanding output in response to the price increase. An RRC strategy that increases variable costs as opposed to fixed costs will be more likely to succeed.

[102] The *Findings of Fact* outline a number of instances of technological input foreclosure. It seems that Microsoft withheld a critical API from Netscape, forcing it to postpone the release of its Windows 95 browser until "substantially after" the release of Windows 95 (*loc. cit.*, at para. 90-92). And, in response to IBM aggressively marketing its own software line as alternatives to Microsoft products, it withheld the Windows 95 "golden master" code (needed for product planning and development), offering IBM early access to the source code only if it stopped pre-installing IBM software on its PCs (*ibid.*, at para. 115-132). Also, application developers were induced to make their Web-based applications reliant on IE-specific technology (*ibid.*, at para. 337-339) and to adopt Microsoft's proprietary version of Java (*ibid.*, at para. 386-407) in exchange for early access to necessary interface information.

[103] Internal Microsoft correspondence, *Findings of Fact*, *loc. cit.*, at para. 160. The *Findings of Fact* offer other examples. Microsoft made its proprietary version of Java incompatible with Sun's cross-platform version (*ibid.*, at para. 386-407). It also appears to have required Internet Content Providers (ICPs) to provide "differentiated content" that would be more attractive when viewed with IE, with "acceptable degradation" when viewed with other browsers, or which would be available only to IE users (*ibid.*, at para. 322). See *Multistate Legal Studies*, *loc. cit.*, which involved a claim that the defendant had deliberately created scheduling conflicts between its course and a related workshop run by a competitor so as to monopolise the workshop market: the court found a triable issue as to whether the schedule conflicts would disproportionately raise the plaintiff's costs. Also, investigations by the DOJ and Civil Aeronautics Board into airline CRS markets found that the software of the two major CRS vendors ordered the display of information in ways that were biased in favour of the owner-airline or its co-hosts: for example, American Airlines added the equivalent of 40 minutes delay to all New York Air flights. See Guerin-Calvert, "Vertical Integration as a Threat to Competition: Airline Computer Reservation Services", in Kwoka and White ed., *op. cit.* (1994) 42, at 46; also Prepared Testimony of Dr. Paul Dempsey before the House Judiciary Committee (November 5 1997).

> even though it would incur costs of software design merely to disadvantage Netscape because Netscape's costs would rise by a much greater amount."[104]

Part Four will consider how competition policy can address the pursuit of incompatibility through technological input foreclosure.

IV. UNILATERAL CONDUCT: COMPATIBILITY ISSUES

> *Competition becomes combat when the competitors begin trying to impede each other instead of advancing themselves – when "Let the best man win" gives way to "Let me win, best or not". Proprietary software is harmful, not because it is a form of competition, but because it is a form of combat among the citizens of our society.*
>
> Richard Stallman, "Why Software Should Be Free"

INTRODUCTION

Dominant-firm incompatibility strategies can be broadly categorised as follows:

- The denial of timely access to interface technologies, such as the Windows APIs, which are necessary to produce interoperable (downstream) products.[105]
- Contrived incompatibility, i.e. changes made to an existing standard that render previously interoperable (downstream) products incompatible with the standard.

In practice, however, some overlap can be expected: for example, a technological tie-in may preclude access and interoperability.

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[104] Lopatka and Page, *loc. cit.*, at 211. The authors also note that while Microsoft could damage Netscape by contractually prohibiting OEMs from adding another browser it is less clear that it would be profitable to do so, i.e. technological input foreclosure may not require the deep pockets necessary to purchase exclusive rights from distributors. For the sake of completeness, it should be noted that the Lopatka and Page conclude that Microsoft did not raise Netscape's costs by engineering incompatibility: "…Microsoft has done no such thing: Navigator runs flawlessly on Windows and OEMs are free to install it."

[105] It has been argued that access to a network standard such as an OS can be compelled under the essential facilities doctrine: see, for example, Ordover and Willing, "Access and Bundling in High-Technology Markets", in Eisenach and Lenard ed., *op. cit.*, 103, at 105-107. This is questionable, but antitrust issues of access to OS interfaces will more likely claim that access was provided on discriminatory terms with the "owner" of the OS favouring its own downstream operations, i.e. the issue will be the quality of the access, rather than the fact of access. It is recognised that the concept of an essential facility "appears to be relevant only where *no form of access* has been given": Coates and McCallum, "Communications (Telecoms, Media and Internet)", in Faull and Nikpay ed., *The EC Law of Competition* (1999) 753-872, at 826 (emphasis added).

IN DEFENCE OF INCOMPATIBILITY

It has been argued that an "informal" tie-in by innovation or integration can be beneficial in that it secures for the innovator a greater degree of control over the quality of the new product than would otherwise be the case:

> "It may be quite difficult for consumers to determine the source of any shortcoming in a new product; by definition, they will be unfamiliar with it. Yet the success of the innovation may depend on consumers' initial perceptions of quality."[106]

It has also been argued that in an environment where the return on investment in innovation is very uncertain a technological tie-in works to protect the innovator, allowing him to extract the exclusive benefit from his new product for some limited time, i.e. until it is reverse engineered.[107] But all this ignores one crucial possibility: the fact that the new version of the monopolist's product succeeded in the marketplace may simply reflect the absence of any viable choice. For much the same reason, the judicial treatment of dominant firm incompatibility strategies is unsatisfying.

In *Foremost Pro Colour v Eastman Kodak*[108] the plaintiff photofinisher alleged that Kodak's development of new products that were incompatible with existing photo-finishing equipment amounted to a technological tie: the new film format could not be processed as before, so it was necessary to purchase a package of film, chemicals and paper. The Court rejected the argument that this was *per se* unlawful, requiring instead some evidence that the innovation was motivated by a desire to compel the purchase of the entire system:

> "The essence of a *per se* unlawful tying arrangement, however, is that it *forecloses* competition in the market for the tied product or products. The creation of technical incompatibilities, without more, does not foreclose competition; rather it increases competition by providing consumers with a choice among differing technologies, advanced and standard, and by providing competing manufacturers with the incentive to enter the new product market by developing similar products of advanced technology."[109]

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[106] Easterbrook, "Predatory Strategies and Counterstrategies", (1981) 48 U Chicago Law Rev 264, at 310. The tie-in is properly "subject to erosion as a result of competitors' responses", i.e. once the system has acquired a reputation for quality the need for joint purchases would lapse. Easterbrook comments that all innovations involve some short-term sacrifice (the amount invested in R&D) and all innovators hope to recoup this investment, perhaps even by becoming monopolists if they can. He notes that "the most desirable innovations would seem to be the most predatory, for R&D costs (the 'sacrifice') and market share (the result) both may be high" (*ibid*., at 309). It has also been argued that a technological tie-in produces the same benefits as a contractual tie-in, but is far less costly to monitor, and that, as a fixed cost, the cost of monitoring will not affect a firm's profit-maximising output. Sidak, "Debunking Predatory Innovation", (1983) 83 Columbia Law Rev 1121, at 1137-1138

[107] *Ibid.*, at 1140-1141

[108] 703 F. 2d 534 (9th Cir. 1983)

[109] *loc. cit.*, at 542

The claim that contrived incompatibility "without more" does not foreclose competition is intellectually dishonest: the antitrust issue is that contrived incompatibility raises rivals' costs, allowing the dominant firm to exercise market power.

California Computer Products v IBM (*CalComp*)[110] involved a claim of (direct) contrived incompatibility: the plaintiff argued that IBM's changes to the design of the interface between the central processing unit (CPU) and peripherals amounted to "technical manipulation".[111] The Court seemed to consider price and performance as inseparable, holding that where an innovation provides equivalent function (i.e. no improvement in performance) at a lower price the result is to make the product more attractive to buyers. As such a cost-saving step, the challenged integration could therefore be considered an improvement.[112] This approach was echoed by the Circuit Court in the litigation arising out of the Microsoft consent decree.[113] It was held that Windows 95 and Internet Explorer 4.0 constituted a single, integrated product if there were "facially plausible benefits to [Microsoft's] integrated design as compared to an operating system combined with a stand-alone browser such as Netscape's Navigator". Alluding to issues of institutional competence, the Court continued: "The question is not whether the integration is a net plus but whether there is a plausible claim that it brings some advantage."[114]

To be sure, antitrust challenges to innovations must be handled with care[115] but it is submitted that a slightly more robust approach would be preferable. Under the EU competition regime, it seems that a software company is free to make design changes "as long as it does so objectively to improve its own product or service, and not primarily with the effect of making difficulties for its downstream competitors".[116] And the proportionality principle could act as a further "limiting principle": a dominant company is not free to cause substantial inconvenience to its competitors to achieve a minimal improvement in its own product.[117] In contrast, under the "sole purpose" standard of the cases considered above, an antitrust plaintiff must establish that the challenged innovation is a device without *any* "facially plausible benefits".

THE WRONG TURN

The *Foremost Pro Color* line of authority began with *Berkey Photo v Eastman Kodak*.[118] There, it was argued that Kodak, as a monopolist in the markets for cameras and

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[110] 613 F. 2d 727 (9th Cir. 1979)
[111] *loc. cit.*, at 743-744
[112] See also *Memorex v IBM* 636 F. 2d 1188 (9th Cir. 1980) and *Transamerica v IBM* 698 F. 2d 1377 (9th Cir. 1983).
[113] 147 F. 3d 935 (D.C. Cir. 1998)
[114] *loc. cit.*, at 948-950
[115] See Cass and Hylton, *loc. cit.*, at 34: "Courts adopt bright-line rules because they know that the alternative balancing test is likely to be applied so inaccurately that adopting a bright-line rule, even though it may favour one party, minimizes total error costs." See also Lopatka and Page, *loc. cit.*, at 198-207.
[116] Temple Lang, (1996 Fordham Corporate Law Institute), *loc. cit.*, at 562
[117] *Ibid.*, at 563. So, integrating functionality into an operating system probably amounts to technical progress if it makes the OS "easier to use, or more functional for *all* users" even if there is no "net plus" achieved through the integration.
[118] 603 F. 2d 263 (2d. Cir. 1979), at 279

photographic film, was in a position to set industry standards and that rivals could not compete without offering similar products to Kodak's. As a result, Kodak was obliged to provide advance information to enable rival camera manufacturers to adapt their products to new film formats it planned to introduce.[119] This argument was roundly rejected. The Court held that Kodak had no duty to provide *advance* information to its rivals in the camera market:[120]

> "The first firm, even a monopolist, to design a new camera format has a right to the lead time that follows from its success. The mere fact that Kodak manufactured film in the new format, so that its customers would not be offered worthless cameras, could not deprive it of that reward. Nor is this conclusion altered because Kodak not only participated in but dominated the film market. Kodak's ability to pioneer formats does not depend on it possessing a film monopoly. Had the firm possessed a much smaller share of the film market, it would nevertheless have been able to manufacture sufficient quantities of 110-size film…to bring the new camera to market. It is apparent, therefore, that the ability to introduce the new format without predisclosure was solely a benefit of integration and not, without more, a use of Kodak's power in the film market to gain a competitive advantage in cameras."[121]

This approach seems largely correct. Kodak had developed an entirely new camera – it had not altered an existing format, nor did it restrict output of existing camera formats so as to boost sales of its new camera and film. Its competitive advantage (the lead time) was a direct result of its innovation in bringing a new product to market – and it was an advantage that would inevitably be eroded as its competitors caught up. Yet in the cases that followed, these distinguishing points were effectively ignored.

Antitrust claims arising out of the introduction of entirely new technology, e.g. *Berkey Photo*, may lack one crucial element: a pre-existing complementary relationship between the plaintiff and defendant. In the next section, I will demonstrate that a rival producing interoperable products is in a complementary relationship with the dominant firm controlling the existing standard and must therefore be afforded an adequate opportunity to adapt to changes in the standard. This reflects commercial reality within software markets: the initial sponsor(s) of a standard will encourage the development of interoperable products as a means of ensuring rapid diffusion of the new standard. The likely antitrust issue is that the sponsor will subsequently "close" the standard, either by denying its rivals quality access to necessary interface information or by engineering incompatibilities with their products.[122]

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[119] Kodak had launched a new line of smaller Instamatic cameras which required a new film format; for a period of 18 months after the launch of the new camera, this new film format was made available only with the new camera. The Circuit Court seemed to see the development of the new film format as an integral part of the development of the new camera "system", *loc. cit.*, at 282.

[120] *Ibid.*, at 281

[121] *Ibid.*, at 283

[122] Katz and Shapiro (in Eisenach and Lenard ed., *op. cit.*, at 65) favour limiting the ability of dominant firms to change their policies by shutting down interfaces that had been open, referring to *Aspen Ski* and the EU Commission's *IBM* investigation (see below).

Under the EU regime, the proportionality principle (mentioned above) represents a means of addressing such a situation. In 1984, for example, IBM ended a four-year investigation by the European Commission by agreeing to disclose in good time sufficient interface information to enable its competitors adapt their hardware and software to new IBM products.[123] IBM's control of the industry standard placed it in a complementary relationship with its rivals, and so it had to have regard to those rivals' interests when making changes to the standard.

CARING, SHARING DOMINANT FIRMS

Returning to the incompatibility strategies mentioned above, it should be noted that both types of unilateral conduct are possible because the disadvantaged firms are in a complementary relationship with the firm controlling the standard, yet also in competition with that firm in the downstream markets in which they operate. For example, developers of word-processing software require access to Windows interface technology if they are to produce Windows-compatible products, yet they also compete with Microsoft in the market for word-processing software.[124] Two cases support the proposition that a firm with monopoly power violates section 2 of the Sherman Act if it excludes rivals from the monopolised market "by restricting a complementary or collaborative relationship without an adequate business justification"[125] – *Aspen Ski* and *Kodak*. This principal can be applied to computer software markets.

Between them, the parties in *Aspen Skiing v Aspen Highlands Skiing*[126] controlled the four downhill skiing mountains in Aspen, Colorado; Aspen Ski controlled three of the four mountains. The firms were of course rivals, yet for years they had offered skiers a six-day "all-Aspen" ticket, dividing the revenues according to usage. In 1978, after Highland

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[123] It was recognised that disclosure would be inappropriate if it disclosed new (non-interface) features of IBM's designs. For a description of the *IBM* investigation, see Temple Lang, "Defining Legitimate Competition: Companies' Duties to Supply Competitors, and Access to Essential Facilities", (1994 Fordham Corporate Law Institute), *International Antitrust Law and Policy* (1995) 245, at 303, and "Pssst! Secrets May Get Out: EU Commission Asks Whether Microsoft Needs to Share Data With Rivals", *Wall Street Journal* (November 20, 2000) 27.

[124] See Wagner, *loc. cit.*, at 1101: "The nature of systems technology…enables its designers easily to exclude others from the technology, so that those seeking access can obtain it only if the designers themselves share their intellectual property with them." Insofar as exclusion will often enhance the designers' return on investment, there is little incentive to allow access.

[125] Baker, "Promoting Innovation Competition Through the Aspen/Kodak Rule", (November 12 1998), Address before The George Mason University Law Review Antitrust Symposium, available at http://www.ftc.gov/speeches/other/mason1098.htm

[126] 472 US 585 (1985). Bork has relied on *Aspen Ski* as authority for the proposition that "a monopolist is not free to define its product for the purpose and with the effect of excluding a competitor". (Bork, "The Case Against Microsoft", *loc. cit.*) It should be clear from the analysis that follows that his interpretation is, at best, strained. Kapen has argued for a narrow interpretation of *Aspen Ski*: "a monopolist's decision to extricate itself from a profitable joint venture can give rise of section 2 liability when the joint venture is demonstrably more efficient than its break-up, the monopolist lacks any legitimate business justification for its conduct, and barriers preclude entry into the relevant market". (Kapen, "Duty to Co-operate under Section 2 of the Sherman Act: *Aspen Skiing's* Slippery Slope", (1987) 72 Cornell Law Review 1047, at 1047) This approach ignores the complementary relationship that was a feature of both *Aspen* and *Kodak*. Note that Kapen characterises the conduct in *Aspen Ski* as an RRC-strategy (*ibid* at 1068).

rejected Aspen Ski's offer of a fixed percentage of revenues considerably below its historical average, the collaborative relationship was terminated. Aspen Ski marketed a multi-area weekly ticket, limited to its three mountains. Highland's share of the market declined steadily over the next four years to about one-half of its previous level. As there was no apparent efficiency justification, Highland succeeded in its antitrust action. The Supreme Court wrote:

> "In the actual case we must decide, the monopolist did not merely reject a novel offer to participate in a cooperative venture that had been proposed by a competitor. Rather, the monopolist elected to make an important change in a pattern of distribution that had originated in a competitive market and had persisted for several years."[127]

Eastman Kodak v Image Technical Services[128] concerned Kodak practices relating to parts and service for its photocopiers and micrographic equipment: essentially, Kodak discontinued its policy of selling spare parts to independent service operators (ISOs). Like *Aspen Ski*, while Kodak competed with independent ISOs in the service market, it also supplied them with the necessary parts. The plaintiff ISO successfully argued that this policy change raised its costs and allowed Kodak to monopolise the provision of service: Kodak was ordered to sell parts to ISOs at non-discriminatory prices. Note too, that the Supreme Court, denying summary judgement for Kodak, accepted that significant information and switching costs weakened the linkage between the markets for service and parts and the (competitive) equipment market, allowing Kodak to exercise market power in the downstream markets.[129]

Some points arise from the discussion of *Aspen Ski* and *Kodak*:

- There must be a pre-existing relationship between the dominant firm and its competitor(s). Note that Posner J has interpreted *Aspen Ski* as meaning that a monopolist may violate section 2 "if it refuses to cooperate with a competitor in circumstances where some cooperation is indispensable" to effective competition.[130] So, the duty arises where effective competition requires some cooperation among competitors.
- Each case involved a policy change resulting in harm to the dominant firm's rivals (but not necessarily the exit of its rivals).

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[127] 474 US 585, at 603.

[128] 504 US 451 (1992)

[129] *loc. cit.*, at 473, 476. The majority's reliance on the force of information and switching costs has generated much comment. While this is not relevant to the present discussion, see, for example: Scalia J (dissent) *ibid.*, at 496-497; Bork, *The Antitrust Paradox*, at 437; Salop, "Exclusionary Vertical Restraints Law: Has Economics Mattered?", (1993) 83 Am Econ Rev 168, at 170-1; Shapiro and Teece, "Systems Competition and Aftermarkets: An Economic Analysis of *Kodak*", The Antitrust Bulletin (Spring 1994), 135

[130] *Olympia Equipment Leasing v Western Union Telegraph* 797 F. 2d 370 (7th Cir. 1986), at 379. Note also that the Court of Appeals in *Multistate Legal Studies* (1995) rejected as too narrow the defendant's interpretation of *Aspen Ski* as authority only for the proposition that the duty arose only where the monopolist had accommodated its competitor in the past.

The *Intel* litigation demonstrates the application of these principles. Intel customarily supplied "strategic" OEMs with advance technical information and samples of prototype central processing units (CPUs) for the purpose of building Intel-compatible computers. Digital, Compaq and Intergraph were three such OEMs, and they each had patents on certain CPU technologies (although only Digital actually competed with Intel in the CPU market). Effectively, they asserted these patents against Intel; Intel responded by cutting off the supply of advance technical information and prototypes in an attempt to force them to licence their patents on favourable terms.[131] An FTC investigation resulted in a consent decree prohibiting Intel from withholding or threatening to withhold certain advanced technical information from a customer for reasons relating to an intellectual property dispute with that customer.[132] Note that the OEMs were long-term Intel customers who relied on the advance technical information and product samples to design their products:

> "Intel is free to license to whomever it wishes – or to choose not to license it (*sic*) at all. But once Intel does grant a licence, and a computer manufacturer relies on the license to design computer systems based on Intel microprocessors, Intel cannot leverage its dominant position in microprocessors to extract intellectual property grants from its customers."[133]

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[131] Digital and Compaq settled their claims and licensed their patents to Intel, whereon the cooperative supply practices resumed. Intergraph instituted a private antitrust claim, which failed: *Intergraph v Intel* 195 F. 3d 1346 (Fed Cir. 1999). It was held that as Intel did not operate downstream in the OEM market, and Intergraph did not operate in the CPU market, there was no evidence that Intel had secured or exploited an unfair advantage for itself, or made either market as a whole generally less competitive.

[132] See Valentine, "Abuse of Dominance in Relation to Intellectual Property: U.S. Perspectives and the Intel Case", (November 15 1999), available at http://www.ftc.gov/speeches/other/dvisraelin.htm. See also www.ftc.gov/os/1999/9903/d09288intelanalysis.htm

[133] Anthony, "Antitrust and Intellectual Property Law: From Adversaries to Partners" (2000), available at http://www.ftc.gov/speeches/other/aipla.htm. See, however, *CSU v Xerox* 203 F. 3d 1322 (Fed Cir. 2000). The facts are similar to those of *Kodak*. Xerox (which manufactures, sells and services high-volume photocopiers) introduced a restrictive parts policy in 1984 and subsequently expanded its scope and tightened its enforcement. The result was that by 1989, ISOs could not purchase Xerox parts directly. However, under a 1994 antitrust settlement, Xerox agreed to suspend the policy. CSU, an ISO, opted out of the settlement and filed suit, alleging that Xerox had violated section 2 by setting prices on its patented products much higher for ISOs than for end-users, thereby raising the costs of its rivals in the service market. CSU sought to rely on a footnote in the Supreme Court judgement in *Kodak*: that "[t]he Court has held many times that power gained through some natural and legal advantage such as a patent…can give rise to liability if a seller exploits its dominant position in one market to expand his empire into the next" (*loc. cit.*, at footnote 29). The *Xerox* court rejected the ISO arguments and distinguished *Kodak* on the grounds that no patents had been asserted in defence of the antitrust claims when the case came to the Supreme Court; it also characterised *Kodak* as a tying case. Arguably, *Xerox* was wrongly decided: the court's approach ignores the identity of Xerox and Kodak's collaborative relationships with the ISOs. The obligation imposed on the dominant firm flows from that relationship: ownership of intellectual property rights may qualify the obligation, i.e. by giving rise to a presumption in favour of the defendant right-holder, but intellectual property rights will not preclude that obligation. The *Xerox* court held that Xerox was under no obligation to sell or licence its patented products, and did not violate the antitrust laws by refusing to do so. It held that a patent may confer the right "to exclude competition altogether in more than one antitrust market". The court refused to consider evidence that the purpose and effect of Xerox' actions were anti-competitive, implicitly rejecting the approach of the Circuit Court in *Image Technical Services v Eastman Kodak* 125 F. 3d 1195 (9th Cir. 1997), i.e. that ownership of intellectual property rights acts as a rebuttable presumption of legitimate business justification. Pitofsky has argued that *Xerox* has "upset [the] traditional balance [between intellectual property and antitrust] in a way that has disturbing implications for

DEVELOPING A COMPATIBILITY CULTURE

In the context of collective efforts to develop a standard, reference was made to a "dynamic compatibility regime": exclusionary rules may be appropriate while a technology competes to become a standard, but once the standard has succeeded in the market, the argument for such restrictions becomes far less compelling. In the context of unilateral conduct, a dynamic compatibility regime would involve strong intellectual property protection while a new standard is developed and advanced, with limits imposed on that protection once the standard has become established in the market.[134] The foregoing sections considered an aspect of this: the appropriate antitrust response to an anti-competitive *change* of policy designed to reduce interoperability and thereby disadvantage firms in downstream markets. Certain duties were imposed on the dominant firm as a result of its control of the standard technology, access to which was necessary to produce interoperable products. This section will consider a more far-reaching question: is there a means of *compelling* access to copyright-protected interface information, thereby encouraging ongoing innovation within a standard and avoiding entirely the possibility of technological input foreclosure?

In theory at least, the copyright fair use doctrine allows disadvantaged firms to obtain access to necessary interface information: it seems clear that the doctrine permits the reverse engineering of software.[135] In *Nintendo*[136] and *Sega*,[137] the reverse engineering of consoles and cartridges so as to discover interface information necessary to develop compatible games was upheld as fair use. The EC Software Directive permits reverse engineering where it is "indispensable to obtain the information necessary to achieve the interoperability of an independently created program with other programs".[138] This recognition that copyright protection of functional requirements governing compatibility should not confer "disproportionate leverage" into related markets involves an acceptance that broad copyright protection of software is not necessary to provide the appropriate

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the future of antitrust in high-technology industries": "Challenges of the New Economy: Issues at the Intersection of Antitrust and Intellectual Property", (June 15 2000), Address before American Antitrust Institute, available at http://www.ftc.gov/speeches/pitofsky/000615speech.htm. Lao also criticises *Xerox*, and more generally, argues for a perspective shift from an intellectual property bias to an antitrust bias: "Unilateral Refusals to Sell or License Intellectual Property and the Antitrust Duty to Deal", (1999) 9 Cornell Journal of Law and Public Policy 193. Finally, note that Xerox' actions can also be compared with "the abrupt discontinuance of a previous business relationship" in *Aspen Ski* (Pitofsky, *loc. cit.*).

[134] See O'Rourke, "Toward a Doctrine of Fair Use in Patent Law", (2000) 100 Columbia Law Rev. 1177, at 1230-1235, and Patterson, "Copyright Misuse and Modified Copyleft: New Solutions to the Challenges of Internet Standardisation", (2000) 98 Michigan Law Rev 1351, at 1352. It is important to recognise that this approach is a response to the economics of network effects, and its application would therefore be limited to network markets.

[135] See Lemley and McGowan, *loc. cit.*; O'Rourke *loc. cit.*; Lande and Sobin, "Reverse Engineering of Computer Software and U.S. Antitrust Law", (1996) 9 Harvard Journal of Law and Technology 237; and Cornish, *Intellectual Property*, 4th ed. (1999), at 516-519.

[136] *Atari Games v Nintendo* 975 F. 2d 832 (Fed. Cir. 1992)

[137] *Sega Enterprises v Accolade* 977 F. 2d 1520 (9th Cir. 1992)

[138] Article 6(1), Directive 91/250/EEC on the Legal Protection of Computer Software

innovation incentives.[139] In reality, however, the reverse engineering of an OS such as Windows would not be practicable.[140]

The copyright misuse doctrine represents another means of obtaining access to interface information.[141] Put simply, this doctrine allows a defence to an infringement action if the copyright is used in a manner contrary to the public policy embodied in the copyright:

> "Specifically, courts can apply it with discretion, tailoring it to prevent the 'lock-up' of a network standard and to provide a ceiling to the level of copyright protection available in cases where there is anticompetitive conduct. At the same time, courts may refuse to apply it in situations where intellectual property rights and social welfare interests are aligned. It is far better for courts to have significant discretion than to stamp out innovation with blunt antitrust remedies or harsh limitations of intellectual property rights."[142]

The misuse doctrine is broader than fair use in that it can secure access to all that was previously available, not just to the functionality underlying the now-protected material. However, "it is on such uncertain legal grounds that courts may be reluctant to apply it".[143] Ultimately, it has to be recognised that the doctrines of fair use and misuse are only available as defences to infringement actions: they operate to prevent the anti-competitive enforcement of the intellectual property rights in a standard, which will often amount to a change of policy falling under the rule in *Aspen Ski* and *Kodak* (discussed above).[144]

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[139] See *Sony Computer Entertainment v Connectix* 203 F. 2d 595 (9th Cir. 2000) at 605: "If Sony wishes to obtain a lawful monopoly on the functional concepts of its software it must satisfy the more stringent standards of the patent law." It seems that the Directive 91/250/EEC allows for the reverse engineering of both compatible (i.e. complementary) and competing products: Guillou, "The Reverse Engineering of Computer Software in Europe and the United States: A Comparative Approach", (1998) 22 Columbia VLA Journal of Law and the Arts 533, at 543. In *Sony Computer Engineering v Connectix* the reverse engineering of the PlayStation system was upheld as fair use despite the fact that the end product was a direct competitor of the PlayStation, suggesting an identity of approach under both regimes.

[140] Note also that software developers have begun to acquire patent protection for APIs (Lemley and McGowan, *loc. cit.*, at footnote 212). In response to this shift, O'Rourke has argued for a patent fair use defence, *loc. cit.*,at 1230-1235.

[141] Patterson, *loc. cit.*, at 1371-77. Also, Frischmann and Moylan, "The Evolving Common Law Doctrine of Copyright Misuse: A Unified Theory and its Application to Software", (2000), 15 Berkeley Technology Law Journal 865.

[142] Patterson, *loc. cit.*, at 1373. See, for example, *Alcatel USA v DGI Technologies* 166 F. 3d 772 (5th Cir. 1999). Alcatel produced telephone switching equipment which was controlled by its copyrighted operating system software. DGI was formed to produce compatible expansion cards, which would allow Alcatel customers additional capacity. In downloading the OS software in order to test its product, DGI infringed Alcatel's copyright. However, the court found that Alcatel had misused its copyright: its anti-competitive licensing provisions prevented competitors from developing interoperable products. It is also interesting to note that DGI contended that Alcatel inserted software "patches" designed to render its card inoperable, *loc. cit.*, at 778.

[143] Patterson, *loc. cit.*, at 1377

[144] Dicta in *Bateman v Mnemonics* 79 F. 3d 1532 (11th Cir. 1996) could support a more general approach whereby requirements of compatibility would qualify the scope of software copyright protection. "Whether the [copyright] protection is unavailable because these [external] factors render the expression unoriginal, non-expressive…or whether these factors compel a finding of fair use, copyright estoppel, or misuse, the result is to deny copyright protection to portions of the computer program. Thus, we today join these other circuits in finding that external considerations such as compatibility may negate a finding of infringement."

Patterson has suggested a more general approach, arguing that the doctrine of estoppel may imply a "copyleft".[145] Copyleft software is software that users are free to use, modify and distribute on the condition that the source code remains open; a copyleft licence requires the user to agree not to assert copyright in respect of any changes or improvements he makes, to disclose the entire source code for those changes, and to disseminate those changes subject to another copyleft licence. However, insofar as the disclosure is not limited to the information necessary for the development of interoperable (i.e. downstream) products, this approach would fail to preserve sufficient innovation incentives; more practically, it binds the licensee, not the licensor. So, Patterson proposes a modified, or reverse, copyleft: a firm is obliged to keep the specifications open as a condition of its standard being accepted by consumers who have relied on its open-source manifestations. While this approach is preferable to the copyright defences discussed above in that it involves the imposition of a positive obligation on dominant firms, it is again limited to policy changes, which can be adequately addressed under the rule in *Aspen Ski* and *Kodak*. Something more far-reaching is required.

RE-THINKING COPYRIGHT

Computer software enjoys copyright protection as a literary work. The argument for reconsidering the appropriate level of copyright protection for software flows from the particular features that distinguish computer programs from other literary works.[146]

The expression in software is "hidden": executable files depend on object code to operate, not human-readable source code. So software users are not afforded any meaningful access to a literary work as such. Indeed, the utility that a user derives from a computer program comes from its functionality, and not from any appreciation of the protected expression. Stallman has identified another distinguishing feature: the ease and desirability of modifying or customising software, which is arguably "one of its great advantages over older technology".[147]

A central element of the "digital" or "networked" economy is the decentralisation of the power to manipulate, copy and redistribute information. However, copyright's inherent trade-off between the interests of authors and publishers and those of society was struck long ago, at a time when individuals were not capable of copying.[148] Consider a modern example – the US Copyright Act of 1976: the major new technology at that time was the photocopier (a means of centralised copying) and computers were only owned by large

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However, these comments were made in the context of a copyright infringement case, and as such cannot be taken to support anything more than a defence.

[145] Patterson, *loc. cit.*, at 1377-1382

[146] See Frischmann and Moylan, *loc. cit.*, at 904-919

[147] Stallman, "Why Software Should Be Free", in Moore ed., *Intellectual Property: Moral, Legal and International Dilemmas* (1997) 283, at 289

[148] See Stallman, "Copyright versus Community in the Age of Computer Networks", available at http://www.carnall.demon.co.uk/stallman/index.html. See also, Laddie J, "Copyright: Over-strength, over-regulated, over-rated?" [1996] 5 EIPR 253, in particular at 253-255.

organisations.[149] It has been argued that, as a result of technological change, society's freedom to copy, modify and redistribute works is now something of real value:

> "As long as the age of the printing press continued, copyright was painless, easy to enforce, and probably a good idea. But the age of the printing press began changing a few decades ago when things like Xerox machines and tape recorders started to be available, and more recently as computer networks have come into use the situation has changed drastically. We are now in a situation technologically more like the ancient world, where anybody who could read something could also make a copy of it that was essentially as good as the best copies anyone could make."[150]

This would suggest that a re-evaluation of copyright's balance between the public and private interests in literary works is appropriate,[151] but modern legislation has tended to shift the balance further in favour of copyright holders.[152] However, the particular features of computer programs could support an argument for qualifying the scope of copyright protection for software. For example, Stallman has proposed a three-year copyright term for computer programs, and that protection would be conditional on the deposit of the source code with some designated public body.[153] Whether a three-year copyright term would sufficiently preserve the innovation incentives is outside the scope of this paper, but the author supports the principal of a significantly shorter term for computer software than currently applies.

Stallman also argues that the nature of software as a functional work requires that users be free to publish modified versions of programs: however, this would practically eliminate innovation incentives.[154] It is submitted that a limited freedom to develop

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[149] Warwick, "Is Copyright Ethical? An Examination of the Theories, Laws and Practices regarding the Private Ownership of Intellectual Work in the United States", (June 1999), available at http://www.bc.edu/bc_org/avp/law/st_org/iptf/commentary/content/1999060505.html.

[150] Stallman, *loc. cit.*

[151] See Warwick, *loc. cit.*: "United States copyright law is theoretically based on policy created within a framework that valued the interests of the people of a whole over the interests of individual creators." And, Cornish (*op. cit.*, at 368): "The first purpose of [copyright] protection is to allow recoupment for the initiative of creating the material and the investment risked in producing and marketing it… Nonetheless, the 'tax upon the public' should be broadly commensurate with the objectives of conferring copyright. A first economic test of this is: what measure of protection is needed to bring about the creation and production of new works and other materials within the copyright sphere?"

[152] Laddie J, *loc. cit.*, at 255, has commented that the "protective wing of copyright" affords right holders the luxury of not having to "meet the competition on price and quality". He describes the current copyright system as being built on "a foundation of accumulated rights, commercial interests, and monetary expectations", *ibid.*, at 259.

[153] Stallman, "Copyright versus Community in the Age of Computer Networks", *loc. cit.* See also Boudin J, *Lotus Development v Borland International* 49 F. 3d 807 (1st Cir. 1995): "Some solutions (e.g., a very short copyright period for menus [i.e. functional aspects of computer programs]) are not options at all for courts but might be for Congress."

[154] See Cornish, *op. cit.*, at 367: "But to suppose that [new technology] will supplant the need for informational, educational and entertainment material which is generated upon the expectation of a market return is the stuff of dreams. Copyright will remain because it provides necessary protection for the investment of intellectual effort and capital in material which is not produced in order to be freely shared. The law may have to be somewhat adapted, but its moral mainspring – that works should not be substantially copied or otherwise taken without authority – expresses a justification for legal intervention

interoperable (i.e. downstream) programs would be more appropriate.[155] Copyright protection of software standards would be subject to a positive obligation to allow access to the technical information to the extent necessary for the development by rivals in downstream markets of interoperable products. And on the expiration of the shorter term, the entire source code would be freely available: this would allow the development of *competing* products, i.e. compatible offerings in the primary (upstream) market.[156]

It will of course be argued that the dynamic compatibility regime envisaged above would fail to preserve sufficient innovation incentives, but despite its superficial appeal this argument should not be unhesitatingly accepted.[157] In network markets, the natural lead-time that an innovator will enjoy is transformed into a significant competitive advantage, so network effects offer considerable protection to the leading firm. It is at least arguable that a shorter copyright term would encourage drastic innovation over the incremental development of existing standards. And while innovation incentives may be reduced initially, there would be wider dissemination of the technical information necessary for the development of compatible products: this would undoubtedly spur innovation within and around an established standard.[158] Farrell and Katz have cautioned that compatibility may under-reward "drastic innovation".[159] It is submitted that this ignores the fact that drastic innovation will *introduce* incompatibility, albeit subject to a shorter term of copyright protection (for the primary software product or standard) and an obligation to allow access to rivals to the extent necessary to develop interoperable products.

Ultimately, it should be recognised that the argument that innovation incentives are higher under incompatibility is not an argument against compatibility: rather, it is an

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which will remain very widely accepted." Warren-Boulton, Baseman and Woroch ("Copyright Protection of Software can make Economic Sense", (1995) The Computer Lawyer, Vol.12 No.2 10) have argued that, under the merger doctrine, API specifications should not be copyrightable at all. However, this approach would not maintain the incentives to innovate in the way that the fair use doctrine does as it would equally protect the slavish copier: Boudin J, *Lotus Development v Borland International*, *loc. cit.*

[155] For example, Haynes has argued that the scope of copyright protection should be limited "to enable reverse engineering not only for access to the information in the software, but for use of the information to make compatible products". (Haynes, "Black Holes of Innovation in the Software Arts", available at http://www.law.berkeley.edu/journals/btlj/articles/14_2/Haynes/html/text.html)

[156] Stallman ("Why Software Should Be Free", *loc. cit.*, at 290-295) has identified a number of other advantages that would follow from limiting the scope of copyright protection for software: the elimination of duplicative effort (or, expressed another way, lower development costs), the freedom to customise software which in turn allows for ongoing, evolutionary development, and better education of future developers. See also Wagner, *loc. cit.* at 1109-1111.

[157] Cornish, *op. cit.*, at 368-369: "To shorten the present copyright period is…unlikely to produce any noticeable effect upon the amount of copyright material which [publishers, record producers or film makers] are prepared to put out for consumption." He concludes that the argument for greater copyright protection has succeeded, not on the basis of revisions of the appropriate economic incentives, but out of a "special admiration for aesthetic creativity". This would support a shorter term for computer software, which is (at least largely) functional.

[158] Wagner proposes an alternative means of promoting open-access technological standards in network markets without unduly weakening innovators' private rights. The current system of property rules allows the holder to prevent exploitation without his consent; under a system of liability rules, however, the owner could not prevent exploitation by others but would receive financial compensation for their use of his work. Liability rules cannot be used for anti-competitive purposes. Wagner argues that recent IP-antitrust cases suggest a shift towards such a system (*loc. cit.* at 1082-1095).

[159] Farrell and Katz, *loc. cit.*, at 647

unqualified argument in favour of monopoly. A dynamic compatibility regime does not question the link between incompatibility and innovation incentives, but it does introduce some qualifications.

V. CONCLUSION

This paper argued for, and considered the viability of, a "dynamic compatibility regime" as a model for competition policy within computer software markets. Such an approach recognises that exclusivity, whether arising from the restrictive provisions of a joint venture agreement or from the intellectual property protection of software, offers the innovation incentives that are critical to technical progress, the key driver of consumer benefits in software markets. However, once a software standard has succeeded on the market, the economic features of the software industry dictate a shift to a compatibility regime. Quality access to the information necessary to produce interoperable products will be indispensable for effective, ongoing competition.

The analysis of the antitrust treatment of collective efforts demonstrated that current policy already incorporates something akin to a dynamic compatibility regime. However, the approach to dominant firm incompatibility strategies is less satisfying. Appropriate analytical tools exist to address a *change* in policy that renders previously interoperable products incompatible with the existing standard. But a true compatibility regime would recognise that access to the information necessary for interoperability is a pre-requisite to effective competition in the markets for interoperable software products, i.e. that there is a positive obligation on dominant firms to allow rivals access to interface information to the extent necessary to develop interoperable products. An argument in favour of qualifying the term and scope of copyright protection for software was constructed, and it is to be hoped that further discussion will follow. Ultimately, what is required is legislative intervention on an international level – yet it must be accepted that this is highly unlikely.

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