# THE APPLICATIONS BARRIER TO ENTRY AND ITS IMPLICATIONS FOR THE *MICROSOFT* REMEDIES: COMMENT ON IANSITI AND RICHARDS

MICHAEL L. KATZ
WILLIAM P. ROGERSON*

## I. INTRODUCTION

The "applications barrier to entry" played a central role in the U.S. Department of Justice's and state plaintiffs' theory of their consolidated cases against Microsoft.[1] The applications barrier to entry arises because a new operating system will be desirable to consumers only if a broad array of software applications can run on it, but software developers will find it profitable to create applications that run on an operating system only if there is a large existing base of users of that operating system who could purchase the applications. As a consequence of these network effects, an operating system entrant would face a potentially overwhelming chicken-and-egg problem with users and applications. The plaintiffs alleged that the applications barrier to entry allowed Microsoft to enjoy significant and prolonged market power in the market for Intel-compatible personal computer (PC) operating systems worldwide.

The plaintiffs also alleged that "middleware"—software that provides an interface between the operating system and applications—would undermine the applications barrier to entry and, thus, facilitate entry into

* Michael L. Katz is the Harvey Golub Professor of Business Leadership, Stern School of Business, New York University, and Professor of Economics and Sarin Chair in Strategy and Leadership, University of California, Berkeley. Prof. Katz is a former Deputy Assistant Attorney General, Antitrust Division, U.S. Department of Justice (2001–2002), and former Chief Economist, Federal Communications Commission (1994–1995). Although Professor Katz served in the Department of Justice at the time *United States v. Microsoft Corp.* was settled, he was involved in neither the litigation nor its settlement. William P. Rogerson is Professor of Economics, Northwestern University, and former Chief Economist, Federal Communications Commission (1998–1999). We are grateful to Shane Greenstein for helpful comments on an earlier draft.

[1] The summary history of the case presented in this introduction draws heavily on the description provided in *New York v. Microsoft Corp.*, 531 F. Supp. 2d 141 (D.D.C. 2008).

operating systems. Middleware was seen as a threat to Microsoft's operating system dominance because, if deployed widely enough, middleware could "commoditize" the operating system. Bill Gates himself offered one form of the theory:

> Netscape's strategy is to make Windows and the Apple Macintosh operating system all but irrelevant by building the browser into a full-featured operating system with information browsing. Over time Netscape will add memory management, file systems, security, scheduling, graphics and everything else in Windows that applications require.
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> The company hopes that its browser will become a de facto platform for software development, ultimately replacing Windows as the mainstream set of software standards.[2]

As another Microsoft executive elaborated:

> [I]f all the developers were focused on building Netscape applications as opposed to Windows applications, then eventually, you know, Netscape decides, hey, we're going to get in the operating system business. And so they build an operating system, and now that's installed. That can get preinstalled on computers so they can sell it at retail, however they decide to distribute that.[3]

The plaintiffs' theory did not rely solely on the possibility that middleware itself would evolve to a competing operating system. Widespread middleware would also ease the migration of applications to a new third-party operating system and, thus, facilitate its entry.[4] The plaintiffs contended that Java, as well as Netscape, threatened Microsoft in this way, and that Microsoft undertook various anticompetitive actions to eliminate Netscape and Java as threats.

Although strongly criticizing District Court Judge Jackson's behavior, limiting the scope of his liability findings, and vacating his remedy decree, the D.C. Circuit affirmed his central conclusion that the core of the plaintiffs' theory of the case was sound with respect to Microsoft's monopoly maintenance in violation of Section 2 of the Sherman Act.[5] Four key findings were that: (i) Microsoft had market power in the market for personal computer operating systems; (ii) the applications barrier to entry was a key source of that market power; (iii) the emergence of certain types of middleware was threatening to erode the applications barrier to entry; and (iv) Microsoft engaged in various exclusionary ac-

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[2] Direct Testimony of Franklin M. Fisher ¶90(i), United States v. Microsoft Corp., No. 98-1232 (D.D.C. filed Jan. 5, 1999) (quoting William Gates, The Internet PC, Apr. 10, 1996), *available at* http://www.usdoj.gov/atr/cases/f213400/213457.pdf.

[3] *Id.* ¶90(iii) (quoting Deposition Transcript of Benjamin Slivka, Sept. 3, 1998).

[4] *Id.* ¶¶ 82–89.

[5] United States v. Microsoft Corp., 253 F.3d 34 (D.C. Cir. 2001).

tions in order to harm these providers of middleware and thus maintain the barrier to entry that supported its market power.

After the appellate court's decision, the U.S. Department of Justice negotiated a proposed settlement with Microsoft, which nine of the state plaintiffs (the New York Group) joined. The settlement proved to be highly controversial. One former official from the Clinton Justice Department went so far as to accuse the Bush Antitrust Division of "taking a dive,"[6] and nine state plaintiffs (the California Group) sought a litigated remedy decree. A year later, Judge Kollar-Kotelly issued three final judgments, all of which largely mirrored the original settlement, save the addition of language regarding the court's retention of jurisdiction and some differences in the creation of certain oversight bodies.

Recently, the central provisions of the Final Judgments were slated to end on the fifth anniversary of the Final Judgments. Once again, debate ensued. Several state plaintiffs argued that Microsoft still possesses monopoly power in the relevant market and that the need to protect nascent competitive threats is as strong today as it was when the case was brought and settled.[7] They called for almost all of the provisions of their Final Judgments to be extended for five years to 2012.[8] In contrast, the U.S. Department of Justice did not request that the Final Judgment in the federal case be extended and, indeed, argued in an amicus brief that the remedy provisions of the Final Judgments in the state case had served their purpose and—subject to a single, previously agreed-to exception—should be allowed to expire.

The exception concerned the requirement that Microsoft provide additional technical information to allow non-Microsoft server software to communicate with Windows clients. Because Microsoft had been slow in meeting its obligations, the requirement had already been extended to November 12, 2009. Based on the argument that the information-sharing provisions had not been fully implemented and, thus, that the complementary package of remedy provisions had not had the opportunity

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[6] Stephen Labaton & Steve Lohr, *U.S. and Some States Split on Microsoft, Risking New Delay*, N.Y. TIMES, Nov. 6, 2001, at C1.

[7] Plaintiff States' Memorandum of Points and Authorities in Support of their Motion to Extend the Final Judgment Until November 12, 2012, New York v. Microsoft Corp., No. 98-1233 (D.D.C. filed Oct. 16, 2007), 2007 U.S. Dist. Ct. Motions LEXIS 39487; Joinder of Plaintiff States of New York, Maryland, Louisiana and Florida in Moving to Extend the Final Judgments, New York v. Microsoft Corp., No. 98-1233 (D.D.C. filed Oct. 18, 2007), *available at* http://www.microsoft.com/presspass/download/legal/ConsentDecree/10-18-07NYSubGroupJoinderForExtension.pdf.

[8] The States did not ask for an extension of § III.B, which governs the extent to which Microsoft could vary the prices charged to certain personal computer manufacturers for licenses to Windows Operating System Products.

to take full effect, Judge Kollar-Kotelly decided to extend the other provisions to November 2009 in order to make all of the provisions coterminous.[9] The court also opined that the question of whether to extend all of the provisions beyond 2009 would be more appropriately decided at a later date.

The issue of whether Microsoft still possesses significant market power was vigorously debated in the briefs and expert reports filed during the proceedings that resulted in the two-year extension.[10] We believe that it is highly unlikely that Microsoft will be swept away by a gale of creative destruction between now and the time the court considers whether to extend the remedy provisions beyond November 2009. Thus, we fully expect the degree of Microsoft's market power to continue to be an issue.

Economic analysis indicates that an assessment of Microsoft's market power in the market for PC operating systems provides a one-sided test. Specifically, a finding that Microsoft does not possess significant market power would indicate that there is very unlikely to be a reason for further extending the life of the remedy provisions. However, a finding that Microsoft continues to possess significant market power would not, by itself, imply that a further extension would be warranted.[11]

Microsoft's share of the personal computer operating system market has changed little over the past five years and is still greater than 90

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[9] *See* New York v. Microsoft Corp, 531 F. Supp. 2d 141, 144 (D.D.C. 2008).

[10] Professor Iansiti filed an expert report on behalf of Microsoft in this proceeding that made many of the same points as the article on which we are commenting. Expert Report of Marco Iansiti, United States v. Microsoft Corp., No. 98-1232 (D.D.C. Aug. 29, 2007), *available at* http://www.microsoft.com/presspass/download/legal/SettlementProceedings/08-30MicrosoftExpertReportExhibitB.pdf.

We benefited from reading a critique of Professor Iansiti's report and a differing and somewhat conflicting description of technological developments in the industry in an expert report prepared by a technology expert and filed by some of the states opposing termination of the remedy provisions. *See* Report of Ronald S. Alepin, Exhibit B to Plaintiff States' Motion to Extend the Final Judgment through November 12, 2012, New York v. Microsoft Corp., No. 98-1233 (D.D.C. filed Oct. 16, 2007), 2007 Misc. Filings LEXIS 1963 [hereinafter *Alepin Report*]. We also benefited from reading another expert report prepared by an economist that was also filed by the opposing side. *See* Expert Report of John Kwoka, Exhibit A to the Plaintiff States' Motion to Extend the Final Judgment through November 12, 2012, New York v. Microsoft Corp., No. 98-1233 (D.D.C. filed Oct. 16, 2007), 2007 Misc. Filings LEXIS 1956 [hereinafter *Kwoka Report*].

[11] An assessment of Microsoft's current degree of market power is also interesting because the extent to which the underlying competitive conditions of the industry have changed provides one, albeit highly imperfect, measure of the success of the remedies that were imposed as a consequence of this case. These conditions are, thus, of some interest both as an historical matter and as a guide for future antitrust enforcement.

percent.[12] This share is clearly large enough that the applications barrier to entry could remain strong if the other factors that allowed it to exist are unchanged. Iansiti and Richards argue that the other factors have not remained static.[13] Specifically, Iansiti and Richards identify several developments in the information technology sector that have occurred since the issuance of the Final Judgments, developments that the authors suggest have significantly reduced the applications barrier to entry.[14]

In the present comment, we will briefly evaluate the economic logic of Iansiti and Richards's arguments and identify the sorts of factual information that we think would need to be established for the arguments to be persuasive. We want to emphasize our focus on the economic logic and observe that we have not attempted to conduct a comprehensive, independent evaluation of technological and market conditions. For the most part, we take Iansiti and Richards's descriptions as given and assess whether the cited developments have had a significant impact on the competitive structure of the industry as seen through the lens of the plaintiffs' theory of the case. We also point out where we think it would be illuminating to elaborate on the nature of the technological changes that have occurred or are likely soon to occur.

Our fundamental conclusion is that, although Iansiti and Richards have identified important developments in the information technology sector whose consequences must be carefully considered and taken into account in any evaluation of the current competitive structure of the industry, we see their article more as providing an interesting and worthwhile description of issues that need to be further explored and considered, rather than as providing a definitive answer.

Because this analysis leaves open the possibility that the applications barrier to entry remains strong and that Microsoft possesses significant market power in the market for PC operating systems, below we also briefly address the question of what factors should enter into a decision of whether to extend the remedy provisions beyond their currently scheduled termination in November 2009. Our central conclusion is that greater attention should be paid to weighing the costs and benefits

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[12] *See Kwoka Report*, *supra* note 10, Exhibit 1.

[13] Marco Iansiti & Greg Richards, *Six Years Later: The Impact of the Evolution of the IT Ecosystem*, *supra* this issue, 75 ANTITRUST L.J. 705 (2009) [hereinafter *Six Years Later*].

[14] For example, they summarize their analysis as finding that "[w]idely adopted platforms provide new, popular alternatives to Microsoft's client operating system for both consumers and developers." *Id.* at 721. In addition, "[c]onsumers and developers are now less dependent on the Windows client and on its unique properties and functionality, and any applications barrier to entry appears to have been significantly reduced." *Id.* at 706.

of continuing to enforce the remedy provisions than was apparently paid in the decision process recently completed.[15]

## II. HAS THE APPLICATIONS BARRIER GONE AWAY?

Iansiti and Richards state that Internet-related use of personal computers has grown dramatically over the past five years. They identify three classes of application as being particularly powerful drivers of this trend, although not the only drivers. One is the rise of Web 2.0 sites, which offer various forms of Internet-based collaborative content creation and online communities, such as the Wikipedia and social networking sites. A second is the increasingly important use of personal computers to download digital media files from the Internet, as well as function as audio and video playback devices. A third very interesting and potentially significant development to which Iansiti and Richards point is the availability of "software as a service," where users of personal computers can access both new and traditional types of applications, such as word processing and electronic spreadsheets, over the Internet using their browsers. For example, Google offers a suite of Web-based software that is similar to—and compatible with—Microsoft Office.

The tremendous growth of Internet-centric applications potentially weakens the applications barrier to entry because these uses are less directly tied to any particular operating system than are traditional client-based applications. The main reason is that Internet-related uses occur through the browser (as well as various "plug-ins," which are programs used to enhance the capabilities of the browser) and, thus, are based on standards and interfaces that do not depend on the underlying PC operating system.[16] As we understand this argument, Iansiti and Richards are asserting that the middleware threat that browsers were identified as posing to the applications barrier to entry during *United States v. Microsoft Corp.* has materialized.

We view this assertion as Iansiti and Richards's core argument, and we agree that the extent to which middleware has displaced the operating system as the software platform to which applications write is one of the key issues that must be addressed in any assessment of the competitive

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[15] It should be noted that we reach this conclusion on the basis of the economics of consumer welfare. We are not offering a legal opinion, and we observe that the Department of Justice argued that a weighing of the costs and benefits of continuing the remedy provisions was not consistent with the law. Brief for United States as Amici Curiae Opposing Motion to Extend the States' Final Judgments, New York v. Microsoft Corp., No. 98-1232 (D.D.C. filed Nov. 9, 2007) [hereinafter *U.S. Amicus Brief Opposing Extension*], *available at* http://www.usdoj.gov/atr/cases/f227500/227585.pdf.

[16] Iansiti & Richards, *Six Years Later*, *supra* note 13, Part III.

structure of the industry. However, we have two major concerns that must be addressed before one can safely conclude that technological and market developments have dramatically eroded whatever market power Microsoft once had.

First, one must address the fact that many traditional applications have *not* migrated to the Web but are still provided by traditional client-based software in the same manner as five years ago. A Gartner report is one of the main sources that Iansiti and Richards use to document the fact that many of the new Internet-centric applications now being created are what they refer to as operating system agnostic (OS-agnostic).[17] As displayed in Figure 1 of Iansiti and Richards's article, the Gartner report predicts that the number of OS-agnostic applications will surpass the number of OS-specific applications available for personal computers by 2011. Somewhat ironically, however, the Gartner report that provides this prediction is titled "Why the Client OS Matters Well Beyond 2011." In fact, based on other excerpts of this report, it appears that the main point of the report is to argue that, although many new applications that are being created are OS-agnostic, the choice of operating system will still continue to be critical for many years to come because of the existence of important legacy applications that are *not* OS-agnostic.[18] Consider, for example, the following excerpt from the Gartner report:

> The client OS may be less important today that it was 10 years ago, but that's a more accurate description for application developers trying to decide on which OS they want their applications to run. New applications are increasingly OS-agnostic, but legacy applications were often developed for a specific OS, usually Windows. Legacy applications last forever (or close to it), meaning that for enterprises, the client OS is still a critical choice and will be for years to come.[19]

Gartner's Research Vice President Michael Silver has been quoted elsewhere as stating, "[w]hile many newer applications are OS-agnostic, older ones are not, and legacy stays installed 'forever.' It's not uncommon to have 10- to 15-year-old apps. We'd estimate that 70% to 80% of the typical enterprise's apps still require Windows."[20] Thus, to the extent that personal computer users still view access to legacy applications as an

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[17] MICHAEL A. SILVER & MARK DRIVER, WHY THE CLIENT OS MATTERS WELL BEYOND 2011 (Gartner, Inc. Aug. 28, 2006); Iansiti & Richards, *supra* note 13, at 712–13.

[18] Although we did not purchase a complete copy of this report, the *Alepin Report* quotes extensively from it. *Alepin Report*, *supra* note 10.

[19] *Id.* at 13 (quoting SILVER & DRIVER, *supra* note 17).

[20] *See* Bill Hayes, *Does the Choice of Operating System Matter Anymore?*, PROCESSOR, Vol. 29 Issue 19, May 11, 2007, at 26, *available at* http://www.processor.com/editorial/article.asp?article=articles%2Fp2919%2F33p19%2F33p19.asp.

essential function that a personal computer must offer, the applications barrier to entry may be little weakened.

There may also be another form of chicken-and-egg problem. It might make sense to port a legacy application to the Web if that allowed the application to run on several different operating systems. However, as long as Windows is the dominant operating system, there is relatively little incentive to do such porting for many applications. Stated another way, entry by a new operating system might be financially attractive if a large number of legacy applications wrote to non-Microsoft middleware that was itself relatively easily ported to the new operating system. However, application developers may not have incentives to write to such middleware in the absence of competitive operating systems. This logic suggests that what is needed is middleware that creates incentives to migrate legacy applications to it, such as the ability to make use of complementary features of the middleware.

This logic also applies to new applications. And one can understand the importance of Iansiti and Richards's three examples of drivers toward Internet-centric applications as examples of this logic in action. An important question going forward is the following: to what extent will the developers of all or most new applications find that writing to middleware allows them to lower the costs or improve the quality of their applications?

A second factor that must be addressed before concluding that the middleware threat has been restored is that Microsoft has a dominant share of browser software. In particular, the Microsoft browser, Internet Explorer, is reported by one source to have an 80 percent market share, with the Mozilla browser, Firefox, having a 15 percent market share, and the remaining 5 percent being spread among a number of small players.[21] Netscape Navigator is no longer a commercially supported product. Its current owner, AOL, announced at the beginning of 2008 that it would no longer support the browser and would stop releasing updates.[22] An application developer relying on Firefox as a way to ignore the underlying operating system would find that its application had a very limited potential market.

It is difficult to see middleware owned and controlled by Microsoft serving as the platform that unseats Windows. For example, suppose

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[21] *See Kwoka Report*, *supra* note 10, Exhibit 3. In citing these numbers, we are not taking a position on whether browsers constitute a relevant antitrust market.

[22] *See* Scott Gilbertson, *Netscape: The Browser that Started It All Dies a Quiet Death*, WIRED BLOG NETWORK: WEBMONKEY MONKEY_BITES (Jan. 31, 2008), http://blog.wired.com/monkeybites/2008/01/netscape-the-br.html.

that all applications wrote to Internet Explorer rather than to the underlying operating system. If the costs of porting applications to other browsers were high enough, Microsoft would have incentives either to make Internet Explorer work only with Windows in order to maintain its PC operating system dominance or to start charging a price for Internet Explorer that took advantage of the applications barrier to entry while allowing multiple operating systems to develop as complements. Porting the applications barrier to entry from the operating system to the browser is not obviously a triumph for competition

One development described by Iansiti and Richards that might address the concern that the applications barrier to entry has been preserved through Microsoft's domination of browser software is that many applications available on the Internet now write directly to Application Programming Interfaces (APIs) of various "plug-ins," such as Adobe Flash Player, instead of writing directly to APIs of the browser. Although the original purpose of these plug-ins was to expand the functionality of browsers, these plug-ins also function as a sort of middleware between the browser and applications and, thus, might reduce any applications barrier to entry created by Microsoft's domination of browser software. That is, if almost all applications wrote to a small number of non-Microsoft plug-ins that could be made fully compatible with a variety of different browsers at relatively low cost, then this development could result in there being very low barriers to entry into the provision of browsers. In this case, Microsoft's very large share of browsers installed might be of less concern. To explore this issue further, it would be necessary to investigate factors, such as the extent to which applications write to plug-ins instead of directly to browsers, the extent to which plug-ins can be made fully compatible with different browsers, and whether Microsoft might have both the incentive and ability to reduce the extent to which plug-ins would be able to be compatible with other browsers. Iansiti and Richards do not consider these issues, and investigating them is beyond the scope of our comment.

In summary, Microsoft's current share of the PC operating system market, as well as the market conditions summarized by Iansiti and Richards, do not provide a sound basis for concluding that the applications barrier to entry has eroded and that Microsoft no longer has significant market power in PC operating systems. This conclusion naturally raises the following question: what facts would one need to see in order to reach a determination that the applications barrier to entry has significantly eroded or is in the process of doing so?

There are at least three sets of developments for which to watch. First, consider middleware. The applications barrier to entry would be signifi-

cantly eroded if there were non-Microsoft middleware that was both widely deployed on end-users' personal computers and widely written to by applications, including legacy applications. Similarly, the barrier would very likely be eroded if there were non-Microsoft middleware that could be widely deployed at low cost and to which it would be very inexpensive to port the vast majority of significant application programs. Absent these conditions, one would have to ask why application developers would write to the middleware. And if they do not, how could an operating system entrant have a reasonable chance of overcoming the applications barrier to entry?

There are also developments that Iansiti and Richards did not identify in their survey of market trends but that we believe might be relevant to assessing the strength of the applications barrier to entry in the future. One is the use of emulator software or other approaches that allow computers with non-Microsoft operating systems to run software designed for Microsoft operating systems. The greater the degree to which emulator software is able to function reliably and transparently (from the user's perspective), the weaker is the applications barrier to entry. We observe in passing that, in an apparent attempt to reduce its competitive disadvantage from a lack of applications relative to Windows, Apple offers software that makes it easier to run Windows and its applications on personal computers loaded with the Apple operating system.[23]

Another development is the evolution of certain hardware platforms that might increasingly become substitutes for personal computers. Over the next few years, it is possible, for example, that a new generation of "smart TVs" will be created that do not use a Microsoft operating system but that allow users to connect to Internet, download media files, and view those files. If this development occurs, then the providers of the operating systems for these devices might be in a good position to enter the adjacent market of operating systems that support applications of the sort traditionally run on personal computers. Similarly it is possible that game consoles will become media and computing centers. Indeed, it is our understanding that this is one of the reasons Microsoft entered that market. All said, these developments have been discussed for many years without ever showing signs of realization, and we view them as more of a hope for the future than as a current competitive threat.

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[23] According to Apple, Parallels Desktop for Mac "gives Apple users the ability to run Windows, Linux or any other operating system and their critical applications at the same time as Mac OS X on any Intel-powered iMac, Mac Mini, MacBook or MacBook Pro." Apple, Inc., Parallels Desktop for Mac 4.0, http://www.apple.com/downloads/macosx/system_disk_utilities/parallelsdesktopformac.html.

## III. WHEN SHOULD THE REMEDY PROVISIONS TERMINATE?

It will be a factual matter whether the applications barrier to entry is strong when the court next considers whether to extend the remedy provisions. For sake of discussion, suppose it turns out that Microsoft continues to possess significant market power, in large part due to the applications barrier to entry. How should the court determine whether it would be appropriate to extend the lives of the various remedy provisions?

There are several possible factors that one might consider in making such a determination. The first two arise from consideration of what economists call "repeat play," which refers to the fact that the governmental plaintiffs may find themselves in similar situations in the future, and the ways in which the plaintiffs act in the current situation can influence how private parties will expect the plaintiffs to behave in those future situations.

One such factor is the credibility of government promises made during settlement negotiations. In its amicus brief, the Department of Justice argued that extending the life of a negotiated settlement beyond the date originally agreed upon would undermine future settlement negotiations by establishing that the government could not be expected to honor its agreements.[24] Observe that this consideration counsels against extending the remedy provisions, even if the court clearly has the legal authority to do so.

The second issue that arises because of repeat play and the formation of reputations is the possibility of moral hazard. Specifically, if a defendant does not meet the terms of the remedy, then—absent sufficient sanctions of some other form—failing to extend the remedy provisions might allow the defendant to benefit from its lack of compliance. Observing this pattern, later defendants in other matters might also attempt to avoid complying with their remedy obligations. In the present matter, this line of argument could be applied to Microsoft's failure to meet its information disclosure obligations on a timely basis.[25]

The two considerations just discussed focus on the effects that actions in the present case would have on future cases. There are also considerations that arise solely within the four corners of the present case. Spe-

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[24] *U.S. Amicus Brief Opposing Extension*, *supra* note 15, at 7. Of course, this argument does not apply to the Final Judgment litigated by the California Group.

[25] This line of reasoning also suggests that sunset provisions tied to specific benchmarks of defendant behavior may, in important circumstances, be more appropriate than the setting of an unconditional date-certain.

cifically, a central economic rationale for actively deciding whether to extend the life of the remedy provisions, rather than relying on the date previously set, is that new information may have become available since the Final Judgments were issued. The court administering the remedy can now make an assessment of the costs and benefits of extending the remedy conditions in the light of new information. In doing so, it is important to ask what the remedy is trying to accomplish and by what mechanisms the objective is intended to be met.

First, consider what the remedy is trying to accomplish. Neither the Department of Justice nor the courts took the view that the remedy was intended to ensure that the market for PC operating systems would become competitive. Rather, the focus was on allowing the re-emergence of middleware as a significant competitive threat to Microsoft's position in the PC operating system market. For example, at the time that it reached its settlement terms with Microsoft, the Department of Justice asserted that its Proposed Final Judgment "will eliminate Microsoft's illegal practices, prevent recurrence of the same or similar practices and restore the competitive threat that middleware products posed prior to Microsoft's unlawful undertakings."[26] And the D.C. Circuit stated that "key to the proper remedy in this case is to end Microsoft's restrictions on potentially threatening middleware, prevent it from hampering similar nascent threats in the future, and restore the competitive conditions created by similar middleware threats."[27] Similarly, Judge Kollar-Kotelly explained that, because Microsoft had been found to have illegally maintained its monopoly but not to have illegally obtained it, "the Court's remedy focused on terminating Microsoft's illegal maintenance of its monopoly, rather than on terminating the monopoly itself."[28] Thus, both the agency and the courts rejected a view that might have otherwise argued that the remedy provisions should remain in place until it is demonstrated that Microsoft no longer has significant market power in the provision of PC operating systems.[29]

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[26] Competitive Impact Statement at 3, United States v. Microsoft Corp., No. 98-1232 (D.D.C. Nov. 15, 2001), *available at* http://www.usdoj.gov/atr/cases/f222900/222994.pdf.

[27] New York v. Microsoft Corp., 531 F. Supp. 2d 141, 156 (D.D.C. 2008) (*D.D.C. Decree Extension 2008*) (quoting Massachusetts v. Microsoft Corp., 373 F.3d 1199, 1243 (D.C. Cir. 2004)).

[28] *Id.* at 148 n.13.

[29] According to the State Plaintiffs seeking to have the remedy provisions extended, Microsoft unfairly characterized these plaintiffs as holding this view. *See* Reply Memorandum of the Moving Plaintiff States in Support of Motions to Extend the Final Judgments, New York v. Microsoft Corp., No. 98-1232 (D.D.C. filed Nov. 16, 2006), 2006 U.S. Dist. Ct. Motions LEXIS 66091 [hereinafter *Reply in Support of Motion to Extend*]; *D.D.C. Decree Extension 2008*, 531 F. Supp. 2d 141.

However, the question remains: what does it mean to restore the competitive threat posed by middleware? At one pole, one might argue that the remedy is intended solely to ensure that no bad acts are undertaken during the remedy period in the event that a competitive threat arises during that period. Under this view, the remedy is not intended to ensure that such a threat actually arises during the remedy period. Instead, it would be enough to know that the remedy would have prevented Microsoft from quashing nascent competitive threats *if* any had arrived while the remedy's provisions were in effect. At the other pole, one might take the view that the remedy is intended to ensure that the defendant again faces the level of competitive threat that it faced before engaging in its illegal conduct, at which point one could rely on the broad enforcement of the antitrust laws to treat any future misconduct.

The market developments cited by Iansiti and Richards might convince someone holding the first view that the remedy has succeeded and is no longer necessary. But it is far from evident to us that someone holding the second view would be convinced that the remedy provisions are no longer needed. For example, one might conclude that Firefox, with a market share of approximately 15 percent, poses a much weaker threat than did Netscape Navigator in its heyday.[30]

Next, consider how the remedy is intended to meet its objective. There are at least three possible mechanisms through which an equitable remedy might restore competition or its threat, and the Final Judgments contained instances of all three. First, the defendant might be required to take actions that would not otherwise be legally required (e.g., disclosure of information that could otherwise legally be kept secret). Second, alternative institutions could be created (e.g., an oversight committee) that provide more intensive monitoring and rapid feedback than would otherwise be available. Third, the terms of the remedy might allow for faster resolution of disputes regarding certain conduct, as if certain actions had become per se illegal rather than being subject to a rule of reason (e.g., imposition of a requirement not to engage in any sort of discrimination). To assess whether the corresponding provisions of the Final Judgments should be extended, one should assess the costs and benefits of each mechanism.[31]

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[30] For an expression of this view, see *Kwoka Report*, *supra* note 10, ¶¶25–27.

[31] We mean "should" from the perspective of what economics indicates is the way to maximize consumer welfare. The Department of Justice argued that, as a legal matter, the weighing of costs and benefits was not a valid approach. *U.S. Amicus Brief Opposing Extension*, *supra* note 15, at 6–7.

First, consider benefits. All three mechanisms heighten scrutiny or accelerate the process of review. The resulting benefits of extending the remedy provisions can thus take two forms. One, potential middleware entrants would have greater assurances that they would not be subject to anticompetitive actions or that, if they were, these actions would be short lived. Thus, entry would be more likely. Two, if entry did occur, Microsoft would be less likely to be able to destroy those firms through anticompetitive actions. The magnitude of these benefits depends on both the likelihood of entry and the differential efficacy of the remedy provisions in comparison with general application of the antitrust laws.

Turning to costs, although we have not reviewed the full record of the remedies proceeding, we have been struck by the lack of discussion of costs. Much of the debate has focused on whether there would be benefits from extending the life of the remedy provisions. There appears to have been comparatively little discussion of the costs. Perhaps this is because there are few costs. According to the states, the only costs Microsoft identified were those arising from the company's being "stigmatized," which on its face is rather implausible given Microsoft's past U.S. conviction and its long and rancorous disputes with the European Commission.

We close this discussion by observing that the analysis should be conducted at the specific-provision level, while taking into account possible complementarities. The facts that the states did not ask to extend Section III.B and that the court extended all of the other provisions on the grounds that the provisions of Section III.E. had not been fully implemented suggest that this has been happening.

## IV. CONCLUSION

The question of whether the applications barrier to entry in the PC operating systems market remains strong five years after the Final Judgments went into effect is an important one. Iansiti and Richards's interesting article makes a useful start at answering this question by describing several major, recent developments in the industry. However, for the reasons we described above, these descriptions do not provide a sound basis for concluding that the applications barrier to entry is no longer significant. Indeed, to some extent, the data cited by Iansiti and Richards suggest that the applications barrier to entry is alive and well. Even more strongly, these data indicate the need for additional fact gathering and analysis before the court next takes up the question of whether to extend the life of the remedy provisions.

We close this comment with a brief observation on timing. In antitrust enforcement, as in life, timing can be everything. It is fashionable in some circles to say that technology moves too fast for antitrust intervention to be productive. For example, in its opinion, the D.C. Circuit asserted:

> As the record in this case indicates, six years seems like an eternity in the computer industry. By the time a court can assess liability, firms, products, and the marketplace are likely to have changed dramatically. This, in turn, threatens enormous practical difficulties for courts considering the appropriate measure of relief in equitable enforcement actions, both in crafting injunctive remedies in the first instance and reviewing those remedies in the second. Conduct remedies may be unavailing in such cases, because innovation to a large degree has already rendered the anticompetitive conduct obsolete (although by no means harmless).[32]

With the benefit of hindsight, it is difficult to see where the rapid pace of technological change has proven to be a problem. In important respects, the market for PC operating systems is little changed. Indeed, the states seeking to extend the remedy provisions cited this (unforeseen) lack of change as one of their rationales for the extension.[33]

The continued dominance of the Windows operating system raises important questions about timing and the efficacy of antitrust in markets characterized by Schumpeterian competition; that is, in markets in which competition primarily occurs through cycles of dramatic innovation, rather than through static price or output competition. One view is that the remedy has been successful and that Windows has maintained its high share of the market by continuing to offer software that is superior to that of its innovating rivals. But another view is that market data indicate that the competitive threat Microsoft once faced has not been restored and the ill effects on competition from Microsoft's past actions continue. Under this view, remedies of the sort embodied in the Final Judgments are doomed to fail because Netscape posed a unique threat, the strength of which will not be equaled by developments for many years to come.[34] And still another view would interpret the lack of entry,

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[32] United States v. Microsoft Corp., 253 F.3d 34, 48–50 (D.C. Cir. 2001).

[33] *Reply in Support of Motion to Extend, supra* note 29, at 2.

[34] If this second view is correct, private antitrust suits seeking treble damages have an important role to play in deterring similar acts by Microsoft or other firms in the future. Absent such financial penalties, there is relatively little disincentive for a firm to engage in exclusionary behavior, except to the extent that the firm is forced to undertake costly remedial actions (e.g., information disclosure) that would not otherwise have been required of it.

even in the face of widespread middleware deployment, as an indication that the plaintiffs' theory of the case was incorrect. Only time will tell which view is correct.