

CASE 17

Networks, Standards, and the Use of Market Dominance: Microsoft (1995)

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INTRODUCTION

On July 15, 1994, the Department of Justice brought a complaint against the Microsoft Corporation alleging violations of Sections 1 and 2 of the Sherman Act. The complaint alleged that Microsoft used exclusionary and anti-competitive contracts to market its personal computer operating system software and thereby unlawfully maintained its monopoly of personal computer (PC) operating systems and unreasonably restrained trade. Simultaneous with the filing of the complaint, Microsoft and the Department of Justice entered into a consent decree in which Microsoft agreed to abide by certain restrictions in its licensing arrangements.¹ The consent decree enabled the Department of Justice to remedy anticompetitive practices, permitted Microsoft to agree to those remedies without admitting antitrust liability, and avoided a likely protracted trial. After a year of legal wrangling, the consent decree was formally approved by the courts on June 16, 1995.

This chapter provides a brief history of the federal antitrust investigation of Microsoft leading to the consent decree. It then describes the allegations of anticompetitive conduct in the government's complaint and summarizes key provisions of the consent decree. It chronicles the judicial skirmish between the U.S. District Court, the Department of Justice, and

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¹The text of the consent decree is in *United States v. Microsoft Corp.*, 1995-2 Trade Cases para. 71,096 (D.D.C. 1995).

Microsoft over the proposed consent decree, and discusses the issue of “monopoly leveraging” that was raised in that debate.

The growth of the IBM PC platform and the ascent of Microsoft is a textbook example of the importance of proprietary standards and network externalities. The company began in 1975 as a partnership between Bill Gates and Paul Allen, then 19 and 21 years old, respectively. Their original business plan focused on the development of computer languages for the new microcomputers. Microsoft entered the operating system business in 1980 at the behest of IBM, which was looking for an operating system for its new IBM PC personal computer. Microsoft developed a disk operating system called MS-DOS, based in part on another operating system, 86-DOS, which it acquired from Seattle Computer Products for the reported sum of \$50,000 (Wallace and Erickson, 1992). IBM licensed MS-DOS from Microsoft, which retained the ownership rights.² The rest, as they say, is history. The combination of the popularity of the IBM personal computer platform and the key role of the operating system in defining the standards for applications and for new operating system improvements propelled Microsoft into one of the greatest commercial success stories of all time. Microsoft became a publicly traded corporation in 1986 with revenues of approximately \$200 million and a net income of \$39 million. By 1996, Microsoft’s revenues had soared to \$8.67 billion. In the same year, Microsoft’s net income was \$2.19 billion, which represents a compound annual growth rate over the ten-year period of almost 50 percent per year. In September 1997, Microsoft had a market capitalization of \$160 billion.

The magnet for antitrust scrutiny of Microsoft was (and continues to be) its market power in personal computer operating systems—the software that controls the operation of a computer by managing the interactions among the computer’s central processing unit, memory, and peripheral devices. Table 17-1 shows shipments of personal computer operating systems for 1991–1993, the years immediately preceding the Department of Justice (DOJ) complaint. Microsoft’s share of all operating systems exceeded 50 percent, and its share of IBM-PC compatible operating systems exceeded 70 percent in this time period.³ These shares likely understate Microsoft’s market influence because IBM’s PC-DOS was a virtual clone of MS-DOS, which IBM licensed from Microsoft. Together, these two products accounted for about 90 percent of the sales of IBM-compatible

²Several reasons have been suggested as to why IBM licensed rather than bought the operating system for its IBM PC, and in the process lost control of key software standards. The IBM PC was on an aggressive development schedule, and licensing was a quick way to acquire the necessary software. Licensing also demonstrated IBM’s commitment to an open platform (although the BIOS and other components were proprietary to IBM). Another suggested explanation is that IBM was wary of allegations of trade secret theft, the risk of which was minimized with a license. (Wallace and Erickson, 1992)

³The Microsoft Windows product available in this time period required MS-DOS or an MS-DOS compatible operating system, and thus is not counted separately in these figures.

TABLE 17-1
New Shipments of Personal Computer Operating Systems
(000's)

Company	Operating System	1990	1991	1992
Microsoft	MS-DOS	11,648	13,178	18,525
IBM	PC-DOS	3,031	3,003	2,315
DR/Novell	DR-DOS	1,737	1,819	1,617
IBM	OS/2	0	0	409
Other IBM-PC compatible		186	288	389
Subtotal: IBM-PC compatible		16,602	18,288	23,255
Apple	Macintosh	1,411	2,204	2,570
UNIX	UNIX	357	582	797
Other	NEC, etc.	5,079	4,628	4,458
Total		23,449	25,702	31,080

Source: Bernstein (1993)

PC operating systems in 1992. Digital Research's DR-DOS (subsequently acquired by Novell) accounted for most of the remainder, although IBM's OS/2 was perceived at that time as a formidable potential competitor. As of June 30, 1993, approximately 120 million PCs in the world utilized MS-DOS.⁴

Microsoft's dominant market share, the high barriers to entry for vendors of new operating systems, and the high costs to consumers if they attempt to switch to other computer platforms together imply that Microsoft has substantial power to determine prices in the market for IBM-compatible personal computer operating systems.⁵ Barriers to entry in the market for IBM-compatible PC operating systems include the considerable time and expense required to develop, test, and market a new PC operating system⁶ and the difficulty of convincing independent software developers to write applications for a new operating system, which is necessary for market success. The latter reflects the importance of network externalities for market structure and competition in this industry.

⁴The installed base of personal computers running Windows software was about 50 million in 1993.

⁵IBM-compatible personal computer operating systems are operating systems that support the x86 class of microprocessors, which includes Intel 286, 386, 486, and Pentium microprocessors, as well as compatible microprocessors manufactured by other companies.

⁶IBM was reported to have spent more than \$1 billion to develop, test, and market its OS/2 operating system (Computer Business Review, 1997).

BACKGROUND OF THE FEDERAL ANTITRUST INVESTIGATIONS OF MICROSOFT

The Federal Trade Commission (FTC) initiated an antitrust investigation of Microsoft in June 1990. The initial stimulus for the FTC probe was a November 13, 1989, joint announcement by IBM and Microsoft that described their development efforts for new graphically based PC operating systems. The announcement outlined a plan in which Microsoft would design its Windows operating system as a platform for low-end systems, while reserving high-end features for IBM's OS/2 operating system (Sherer and Fisher, 1991). The alleged agreement between Microsoft and IBM raised competitive concerns because it had elements of a market division between two actual (or potential) competitors. However, the FTC had little time to contemplate the competitive effects of the IBM-Microsoft development strategy because whatever cooperation there was between the two companies in the development of operating systems soon dissolved. By early 1991, Microsoft was promoting Windows as a fully featured operating system, and IBM was promoting its yet to be released OS/2 operating system as a competitive alternative to Windows (Zachmann, 1991). The two companies were clearly on separate, competing tracks to develop and market the next generation of graphically based PC operating systems.⁷

Once the antitrust probe was under way, the FTC heard a panoply of allegations that Microsoft's success was not solely the product of its business acumen and the power of network externalities. Critics asserted that Microsoft had engaged in anticompetitive conduct that was designed to eliminate competition in PC operating systems and applications. In response to these concerns, the FTC expanded its investigation into other areas of Microsoft's conduct, including whether Microsoft used its dominance in operating systems to coerce original equipment computer manufacturers (OEMs) and computer distributors to purchase other Microsoft products and whether Microsoft leveraged control over information flows between its operating systems and applications groups to disadvantage competitors.

In response to these claims, after three years of investigation, the FTC's legal staff recommended that the Commission bring a case that focused on Microsoft's licensing practices with its OEMs.⁸ However, the recommendation failed to win the majority vote of the commissioners required

⁷An additional complaint lodged against Microsoft was that its flip-flop with IBM over OS/2 created confusion among application software developers that advantaged Microsoft's applications. For example, a senior executive at WordPerfect claimed that WordPerfect was nine months late in getting to market with its Windows product because it had bet on OS/2 instead of Windows, initially with Microsoft's encouragement (Fisher, 1991, p. 21).

⁸The FTC economics staff did not recommend that the Commission file a case against Microsoft (Lopatka and Page, 1995).

to bring a case. In February of 1993 the Commission (with one member recused) deadlocked in a 2-to-2 vote, which ended the investigation.

Soon after the FTC's vote, the Antitrust Division of the Department of Justice, in an unusual but not unprecedented action, continued the investigation of Microsoft. The Division's investigation was far reaching and had the benefit of the work product of the FTC. In addition, the DOJ issued twenty-one Civil Investigative Demands (subpoenas for information) to Microsoft and third parties, interviewed more than 100 people at roughly eighty companies, and deposed twenty-two individuals including Microsoft's chairman and other key executives. The DOJ's investigation alone consumed approximately 14,000 attorney hours, 3650 economist hours, and 5500 paralegal hours. Together, the DOJ and the FTC accumulated approximately one million pages of documents related to the Microsoft investigation (Bender, 1995).

MICROSOFT'S LICENSING PRACTICES

The Department of Justice investigation culminated in a complaint against Microsoft that focused on Microsoft's licensing arrangements with original equipment manufacturers of PCs and on Microsoft's nondisclosure agreements with independent software developers. The general thrust of the complaint was that Microsoft had engaged in several practices that had the effect of promoting a de facto exclusive dealing arrangement with its OEMs and with independent software developers. The licensing practices identified in the DOJ complaint are:

- long term contracts
- large minimum commitments
- the "per-processor" contract
- overly restrictive nondisclosure agreements

Simultaneous with the U.S. consent decree, Microsoft and the European Economic Commission (EEC) entered into a substantially similar consent decree. The EEC had investigated allegations of Microsoft's licensing arrangements in Europe that were similar to the allegations in the United States. Microsoft, the Department of Justice, and the EEC entered into joint negotiations over the terms of an acceptable settlement, which enabled Microsoft and the antitrust authorities to deal with the competition issues at a global level. Global coordination of competition policy is obviously desirable for markets, such as computer software, that are international in scope. In these markets, international differences in permissible licensing arrangements risk incurring large transaction costs on firms and ultimately harming consumers. By allowing Microsoft to deal with

competition allegations at a global level, the jointly coordinated consent decree represented a major positive development for international antitrust policy. We will first describe the competitive concerns associated with these licensing practices, followed by a summary of the prohibitions on Microsoft's conduct specified in the consent decree.

Long-term Contracts with Large Minimum Commitments

Economic theory illustrates how a firm can employ long-term contracts with large minimum commitments to maintain a monopoly. Suppose that a firm, such as Microsoft, sells its product to a large number of buyers, who make independent purchase decisions. In the Microsoft case, the consumers are OEMs. A large number of OEMs sell IBM-compatible PCs, although a few account for a disproportionately large share.

The seller may charge prices that substantially exceed competitive levels if the firm can foreclose the entry of competitors. This could be accomplished by entering into long-term contracts with minimum commitments that bind customers to make their purchases from the firm. The difficulty with this strategy is that the firm must convince customers to accept the long-term contracts, even though customers would benefit from the competition created by the entry of rival suppliers. In the Microsoft situation, why would OEMs agree to purchase most or all of their operating systems from Microsoft, if by doing so they foreclose entry of new operating systems and thus deny themselves the benefit of competition?

Rasmussen, Ramseyer, and Wiley (1991) provide an answer. They show that consumers, acting independently, may voluntarily sign contracts to purchase from a firm at monopoly prices, even though each consumer would prefer to purchase from an entrant at a lower price.

This result can occur if each OEM believes that it is too small to have an effect on the demand that is available for a new operating system. In that case, no OEM would have an incentive to reject a long-term contract from Microsoft, because its rejection would have no impact on the likelihood of entry. Thus a rational OEM, anticipating that its purchase decision will have no effect on entry, would be better off buying from Microsoft, even at an elevated price.⁹ Segal and Whinston (1996) refine the Rasmussen analysis and show that a monopolist may profitably use long-term contracts to foreclose entry under a wide range of circumstances.

Contracts can impede entry if the number of customers who are free to exercise choice of a supplier is less than the minimum scale required for profitable entry. Short-term contracts are less likely to deter entry because shorter contracts imply that more customers are free to negotiate with a new supplier at any date. Short-term contracts do not guarantee that customers will choose a new supplier when they have the opportunity to exer-

⁹This assumes the consumer enjoys some surplus at the monopoly price.

cise choice. As discussed above, buyers, acting independently, may resign themselves to purchase at monopoly prices if they believe that their purchase decisions cannot affect the state of competition in the market. However, the number of customers who are free to choose is larger when contracts have short durations, and thus the likelihood is greater that an entrant can assemble a large enough demand to be profitable.

Minimum commitments obligate the consumer to purchase from the incumbent supplier. If the minimum commitment is large, there is little demand available for an entrant during the term of the contract, and thus the purchase obligation, in combination with the contract term, can successfully impede entry. Microsoft's minimum commitment obligations often were 50 percent or more of an OEM's expected sales. The terms of these licenses often were in excess of three years, and some were for as long as five years. These are long terms relative to the product cycle of computer software. In addition, Microsoft often would credit unused balances on a customer's minimum commitment obligation if the customer would agree to a new long-term contract. Otherwise, such balances came due and payable. The effect of this practice was to extend the duration of the contract life, since most customers would rather roll forward their unused balances into a new contract than have to pay off their current obligation.

For Microsoft's exclusive dealing provisions to have an anticompetitive effect, they must succeed in foreclosing entry of competing operating systems, or at least substantially increase the height of entry barriers, and thereby raise the price or reduce the quality of operating systems that are available to consumers. To accomplish this, the demand available to a new entrant as a consequence of Microsoft's licensing practices must be less than the minimum efficient scale of entry. In *Jefferson Parish Hospital District No. 2 v. Hyde*, 466 U.S. 2 (1984), a concurring Supreme Court opinion by four justices recognized that exclusive dealing is an unreasonable restraint on trade only when a significant fraction of buyers or sellers are frozen out of a market by the exclusive deal.¹⁰ The concurring justices then went on to find, without engaging in a detailed analysis of the market, that the exclusive contract (which foreclosed 30% of the market) was not an unreasonable restraint of trade because there was no likelihood that the exclusive contract would unreasonably enhance market power.¹¹

There are procompetitive reasons for the use of long-term contracts with minimum commitments. Long term contracts and minimum commitments provide assurance that a new product (such as Microsoft's Windows

¹⁰The case involved a five-year exclusive contract between a hospital and a firm of anesthesiologists. The majority opinion in *Jefferson Parish* addressed the contract as a tied sale rather than as an exclusive dealing contract. See the discussion by William Lynk (Case 14) in this volume.

¹¹Note that courts have upheld practices that effectively operate as partial exclusive dealing arrangements—partial requirements contracts, minimum purchase requirements, and sales quotas—on the basis that they do not preclude competing sellers from selling to the buyers on whom the partial exclusive dealing requirements have been imposed.

95) will achieve sales objectives. This assurance helps to promote investment in the new product by Microsoft, by software companies that develop complementary applications, and by the OEMs that market the computer systems. From the OEM's perspective, a long-term contract provides a reliable source of supply and may also provide protection against future price increases. Moreover, even if Microsoft's contracts had the effect of committing existing OEMs to use only Microsoft's products, this would not prevent the entry of competing operating system products if the minimum efficient scale of entry for an OEM that specializes in an alternative operating system (e.g., Apple) is sufficiently small.

The "Per-Processor" Contract

The most publicized aspect of Microsoft's licensing arrangements was the "per-processor" contract. Microsoft licensed its operating system software under three types of contracts. The "per-copy" contract charged the customer (usually an OEM) a fee for each copy of the operating system software that the customer installed on a machine. Under a "per-processor" contract, the OEM paid Microsoft a fee for each sale of a computer system that used a designated microprocessor, such as the Intel 80486 microprocessor, whether or not the system was sold with a Microsoft operating system. Microsoft also offered a third contracting alternative, the "per-system" contract, which allowed the OEM to designate a particular computer model and charged the OEM for each unit of the designated model that it sold. Under the per-system contract, the OEM had the option of paying Microsoft only for sales of computers that were shipped with Microsoft operating systems. For example, the OEM could designate a model number, for example the Alpha 486/33i, that was sold with IBM's OS/2 operating system and was exempt from a Microsoft royalty. By contrast, under the per-processor contract, the OEM was obligated to pay Microsoft for sales of all computers that included the designated microprocessor. Thus, if the Intel 486 microprocessor was included in the OEM's contract, the OEM would have to pay Microsoft a royalty on each sale of the Alpha 486/33i.

Typically, Microsoft's unit royalty was highest on the per-copy contract. Microsoft tended to offer its larger OEMs the best prices on a per-processor contract, and over time the share of Microsoft's operating system products that were licensed under the per-processor contract increased substantially. Table 17-2 shows the percentage of MS-DOS units sold under per-processor licenses. The share increased from about 20 percent in fiscal year 1989 to 60 percent in fiscal year 1993. The percentage of Windows sales to OEMs under the per-processor license was 43 percent in FY 1993.

The per-processor contract has certain features in common with entry-detering contracts described by Aghion and Bolton (1987). They

TABLE 17-2
Percentage of MS-DOS Units Sold Under Per-Processor Licenses

Fiscal Year	Percentage
1989	20
1990	22
1991	27
1992	50
1993	60

Source: DOJ Competitive Impact Statement.

consider a market in which a buyer and an established seller enter into a contract that calls for the buyer to pay a price, p , if the buyer makes a purchase from the established seller, and to pay a penalty, f , if the buyer purchases from any other seller (a “take-or-pay” contract). The penalty tilts competition in favor of the established firm, since the effective cost of a purchase from another firm is $p_e + f$, where p_e is the firm’s per-unit price. In the per-processor contract, the purchase price and the penalty are the same. Aghion and Bolton show that if the buyer (the OEM) and the established seller (Microsoft) bargain over contract terms without the participation of other sellers, then the buyer may agree to a contract that would foreclose the entry of a potentially more efficient rival.

However, the per-processor contract also can be characterized in more innocent ways. The contract can promote economic efficiency by discouraging piracy of Microsoft’s operating system. Under a per-copy or per-system contract, an OEM could sell a machine without an operating system and avoid paying a royalty to Microsoft. The OEM could pass some of these savings on to the buyer of the computer system, who could obtain an operating system perhaps by illegal means. The quantitative significance of this alleged efficiency is questionable. Abetting software piracy clearly would put an OEM at risk as a vendor of Microsoft products. Moreover, Microsoft sells only operating system upgrades in the retail channel, so a consumer would face obstacles in obtaining a Microsoft operating system for a “naked” machine.

Focusing on the pricing effects of the per-processor contract, one can argue that it does not have the inefficient entry-detering consequences that Aghion and Bolton identify. Aghion and Bolton consider competition between firms selling identical products, whereas sellers of computer software typically compete in the attributes that the products offer to consumers (they are “differentiated” products). To see how the per-processor contract affects competition between differentiated operating systems, let u be the value that the OEM places on the Microsoft operating system (as measured by the price it can command for a Microsoft equipped system). Similarly, let v be the value that the OEM places on an alternative operating system, and

let p_e be the per-unit price of the alternative operating system. Under the per-processor contract, the net value to the OEM of selling an additional computer with a Microsoft operating system is $u - p$, where p is the per-processor fee. The net value to the OEM from selling a computer with a rival operating system is $v - p_e - p$. An OEM may benefit from the use of a competing operating system if $v > u + p_e$. In contrast, the use of the alternative operating system is socially optimal if and only if $v > u + (c_e - c_m)$, where c_e and c_m are the marginal costs of the rival and Microsoft operating systems.

If we ignore the typically small short-run marginal costs of computer software, the use of an alternative operating system would be socially optimal only if $v > u$. Under this assumption, the distortion in the OEM's decision is caused not by Microsoft's take-or-pay contract, but rather by the entrant's choice of a strictly positive per-unit price. Thus, to achieve a level playing field, the per-processor contract forces the vendor of the rival operating system to compete by offering the OEM a contract with a zero marginal price (i.e., a fixed-price contract).

Competition with fixed fees may seem efficient when the low marginal cost of operating system software is taken into account. Efficient pricing in the short run calls for prices to equal marginal cost, which is close to zero for software (particularly for software that is distributed through OEMs, thereby reducing marginal distribution and selling expenses). However, this result ignores important longer-run dynamics of the software market. Extending work by Segal and Whinston (1997), Gilbert and Shapiro (1997) show that contracts of the per-processor type can distort economic efficiency by reducing incentives for rival vendors to invest in their software products. The per-processor fee extracts some of the profits that an entrant could earn in the form of a payment to Microsoft, a part of which Microsoft may pass on to the OEM. The reduction in the profit of the entrant reduces the incentive for the entrant to invest. In this way, the per-processor fee has negative consequences for competition in the long run, even if it arguably has some benefits by forcing vendors to compete with very low marginal prices in the short run.

Microsoft's Nondisclosure Requirements

The Department of Justice complaint also alleged that Microsoft interfered with competition by imposing excessive nondisclosure requirements on independent developers of application software programs. The success of an operating system depends on the application programs that will run under the control of that system. Both Microsoft and independent software developers have an interest in cooperating during the development (beta test) stage of the operating system. Microsoft benefits by expanding the number of compatible application programs, and independent software vendors benefit by having a head start in the release of their products.

There is a legitimate role for nondisclosure agreements. Microsoft cannot involve application writers in its beta test without disclosing some confidential information about the structure and design of its product. However, Microsoft's nondisclosure agreements in connection with its Windows 95 beta test prevented at least some independent software developers from working with competitors of Microsoft for more than a year, which is a long time in the fast paced computer industry. Microsoft's nondisclosure agreements had the effect of encouraging application developers to be exclusive to the Microsoft operating system by imposing high costs on developers who would choose to write programs for another system. The theory of penalty clauses is applicable to Microsoft's nondisclosure conditions and leads to the similar conclusion that the nondisclosure conditions raise the cost of entry for developers of rival operating systems.

THE CONSENT DECREE

The consent decree (also called the Final Judgment) applies to Microsoft's current and predecessor versions of MS-DOS, Windows, Windows for Workgroups, and to successor versions of these products, including Windows 95 (the "covered products"). Excluded from the decree are Microsoft's network server products, Windows NT Workstation and Windows NT Advanced Server, neither of which had a significant share of the relevant market at the time (Competitive Impact Statement, p. 8).

The decree limits the duration of Microsoft's license agreements with OEMs for any covered product to one year, with OEMs having an option to renew the license for up to one additional year on the same terms and conditions as the original license. It also states that Microsoft shall not enter into any license agreement containing a minimum commitment.

The decree limits the duration of a nondisclosure agreement (NDA) for the pre-commercial release of any covered product to the lesser of (a) the commercial release of the product covered by the NDA, (b) a public disclosure authorized by Microsoft of information covered by the NDA, or (c) one year from the date of the disclosure of the information covered by the NDA. In addition, NDAs for the covered products may not restrict persons from developing software products that would run on competing operating systems, provided that such development efforts do not disclose or use any Microsoft proprietary information.

The decree prohibits Microsoft from entering into per-processor licenses, but does permit per-copy and per-system licenses. If Microsoft offers a customer a per-system license, the decree requires that the license agreement include a statement that explains the rights of the customer to include or exclude computer systems from the license agreement. In particular the required statement includes the warning that "As a Customer, you may create a 'New System' at any time that does not require the payment of

a royalty to Microsoft unless the Customer and Microsoft agree to add it to the License Agreement.” This clearly distinguishes a per-system license from a per-processor license, which would require the customer to pay the same royalty to Microsoft for every system the customer sells that contains a covered CPU.

The decree prohibits “lump sum pricing,” defined as a royalty payment for a covered product that does not vary with the number of copies licensed or sold. However, the decree explicitly permits Microsoft “. . . to use royalty rates, including rates employing volume discounts, agreed upon in advance with respect to each individual OEM. . . .” Microsoft and an OEM may develop nonbinding estimates of projected sales, and Microsoft may charge royalties that depend on these projections. Thus the decree does not prohibit price discrimination or volume pricing incentives.

The decree includes certain provisions that, in the words of the Competitive Impact Statement, “. . . go beyond the alleged exclusionary practices in order to ensure that Microsoft’s future contracting practices—not challenged here because not yet used—do not unreasonably impede competition.” These parts of the decree prohibit Microsoft from engaging in tied sales or from restricting the freedom of an OEM to license, purchase, use, or distribute a non-Microsoft product. These provisions became the subject of a separate dispute over Microsoft’s licensing practices involving its internet browser, as discussed below.

The decree’s treatment of volume discounting met with some criticism on the theory that Microsoft can use volume discounts to force OEMs to purchase desired minimums, for example by using “cliff pricing” in which the marginal (or even average) price of the operating system declines precipitously if an OEM’s purchases exceed a threshold level (Baseman et al., 1995). Indeed, a contract may include financial incentives that have the economic effect of promoting exclusive dealing. However, volume discounts also can be procompetitive.¹² The Competitive Impact Statement explained that, “The Department ultimately concluded that it would not require provisions in the Final Judgment to attempt to proscribe in advance the various means by which Microsoft could attempt to structure volume discounts as a means to thwart competition rather than as a means of promoting competition . . . ,” in part because there was no evidence that Microsoft had structured its volume discounts to achieve anticompetitive ends. The Competitive Impact Statement also expressed that the Department stood ready to initiate an antitrust action should Microsoft adopt anticompetitive volume discount structures in its future licensing agreements.

¹²It has been argued that volume discounts have no efficiency advantage relative to uniform prices for an intermediate good such as an operating system (Baseman et al., 1995). However, this argument is valid only under restrictive assumptions. There are a wide range of conditions under which volume discounts may be beneficial. For example, Microsoft could employ volume discounts (with procompetitive results) to encourage OEMs to sell computers that use a new operating system, such as Windows 95 or Windows 98.

THE HEARING

Antitrust consent decrees proposed by the Department of Justice are not legally binding until approved by a court, which must evaluate the decree under the public interest standard specified in the Tunney Act. The Microsoft consent decree went before Judge Stanley Sporkin of the U.S. District Court for the District of Columbia. Judge Sporkin called for a hearing on the decree and requested that the Department of Justice and Microsoft respond to several questions. These included:

1. Why the consent decree should not cover all of Microsoft's operating system products
2. How the proposed consent decree would restore competitive balance to the operating systems market
3. Why the decree should not be amended to include provisions that would
 - a) establish a wall between the development of operating systems software and the development of applications software at Microsoft
 - b) bar Microsoft from engaging in the practice of "vaporware"
 - c) require Microsoft to disclose all instruction codes in its operating system software designed to give Microsoft an advantage over competitors in the applications software market

Both the Department of Justice and Microsoft argued that many of Judge Sporkin's questions covered issues that were not properly addressed in a Tunney Act proceeding. The Tunney Act, they argued, permitted the court to review the adequacy of the consent decree in light of the anticompetitive conduct that was alleged in the complaint. The Department of Justice, not the court, has the discretion to define the case it wishes to prosecute. The Department of Justice chose not to bring a case alleging that Microsoft had engaged in anticompetitive product pre-announcements ("vaporware").¹³ Similarly, the Department of Justice did not allege in its complaint that Microsoft had used its market power in operating systems to harm competition in markets for applications software. Consequently, both the Department of Justice and Microsoft maintained that the items in part (3) of Judge Sporkin's questions exceeded the court's authority in evaluating the adequacy of the proposed consent decree.

Even under the parties' interpretation of the scope of the Tunney Act review, valid issues remained with respect to parts (1) and (2) of Judge

¹³Product pre-announcements can have anticompetitive effects by causing consumers to wait for the introduction of a new product rather than switch to another, available product. See, for example, Katz and Shapiro (1985) and Farrell and Saloner (1986). Whether such announcements constitute an antitrust violation depends on whether the announcements are knowingly false and whether they have the effect of monopolizing a market.

Sporkin's list. As discussed above, the proposed consent decree excluded Windows NT Workstation and Windows NT Advanced Server because Microsoft did not, at the time, have substantial market power in markets for network server products. With respect to restoring competitive balance to the operating systems market, the position of the Department of Justice was that eliminating Microsoft's anticompetitive licensing practices would remove artificial barriers to the entry of competing operating systems, and thus restore a level competitive playing field.

In response to Judge Sporkin's concerns, a lively debate ensued as to whether the proposed consent decree was an adequate remedy for Microsoft's anticompetitive practices. A focus of this debate was the interaction between Microsoft's conduct and the effect of Microsoft's installed base of users in maintaining its market power. A memorandum of unnamed amici curiae (literally, "friends of the court") argued that Microsoft's installed base of users had increased more than six-fold from 1988 to 1995, that this increase in its installed base was the result of anticompetitive licensing practices, and that Microsoft's large, unlawfully acquired installed base allows Microsoft to displace competing operating system and application software products, including competing products with greater functionality. The memorandum's thrust was that it was not enough to stop Microsoft's anticompetitive licensing practices. The damage to competition was achieved by unlawfully expanding Microsoft's installed base: "Contrary to the assertions of the Assistant Attorney General, the relief proposed by the Government, a cessation of further anticompetitive practices, will not restore competition to the X86 operating system market because of the 'network effects' present in the market."¹⁴ Thus, the memorandum to the court concluded that "Microsoft's installed base and share of the applications market is so large that its products are 'locked-in' and true competition can be restored only through truly massive forces or structural relief."¹⁵

With respect to the claim that Microsoft had amassed its installed base using anticompetitive licensing practices, the Department noted that Microsoft did not employ the per-processor license until 1988 and that the share of OEMs subjected to anticompetitive licensing practices was relatively insignificant as late as 1991. Thus, the Department argued that the growth of Microsoft's installed base was largely the result of the success of the IBM-compatible PC platform and not of the licensing practices challenged in the government's complaint. The Department of Justice argued that its proposed consent decree was a timely and expeditious means to address the potential effects of Microsoft's licensing practices on the emergence of future competition in operating systems, particularly IBM's OS/2, which had features that substantially differentiated it from

¹⁴Memorandum of Amici Curiae in opposition to Proposed Final Judgment, *U.S. v. Microsoft*, CA 94-1564 (ss), p. 84.

¹⁵*Ibid.*, p. 76.

Microsoft's DOS and Windows products. The Department's economics expert underscored this point, stating that "Microsoft's anticompetitive licensing practices, although a significant impediment to the use of the OEM distribution channel by competing operating system suppliers, made only a minor contribution to the growth of Microsoft's installed base."¹⁶

Judge Sporkin was unimpressed, and on February 15, 1995, ruled that the proposed consent decree was not in the public interest (*United States v. Microsoft Corp.*, 159 F.R.D. 318 (D.D.C.) (1995)). The government and Microsoft appealed. In an expedited proceeding, the Court of Appeals for the D.C. Circuit heard oral argument two months after the District Court's decision and issued its decision two months later. The Court of Appeals found that the District Court had exceeded its authority under the Tunney Act, ordered approval of the proposed consent decree, and removed Judge Sporkin from the case (*United States v. Microsoft Corp.*, 56 F.3d 1448 (D.C. Cir. 1995) (Anderson, 1996).

MONOPOLY LEVERAGING

Although the DOJ complaint did not address many of the competitive allegations raised by Judge Sporkin, those allegations do raise important economic and legal issues. We will briefly discuss some of the broader concerns about Microsoft's use of its economic power in operating systems to affect competition in application programs.

All application software has to communicate with the computer's operating system to perform essential functions such as memory management, interaction with other programs, and communication with the computer's peripheral devices. Detailed information about the operating system is necessary for application programs to function effectively, and it is likely that Microsoft application software developers enjoy a lead time advantage in access to important operating system information. For example, advance information about Microsoft's Windows operating system gives Microsoft application developers a head start in producing Windows-compatible programs and helps to ensure that their programs function efficiently and seamlessly with other programs. In addition, Microsoft's rivals have complained that they cannot learn the details of the operating system or encourage Microsoft to introduce desired features in the operating system without revealing confidential information about their products.¹⁷

While much can be said of the benefits that accrue to Microsoft from its ownership of the operating system, there are also valid business reasons that restrain Microsoft from fully exploiting its informational advantage. A

¹⁶Declaration of Kenneth Arrow.

¹⁷"By far the most nagging ISV [independent software vendor] complaint about Microsoft is its notorious reputation of evaluating third-party technology, then announcing surprisingly similar, competing products" (Fisher, 1991).

broad array of compatible application programs enhances the value of the operating system, and therefore an operating system vendor has an economic incentive to promote compatibility.¹⁸ The success of Microsoft's Windows depended on convincing large numbers of application software developers to write programs that would run under the Windows platform.

The legal hurdle to a successful monopoly leveraging claim depends in part on the required proof of competitive impact.¹⁹ The U.S. Supreme Court has held that evidence of an adverse competitive impact on adjacent markets is not sufficient to establish a monopoly leveraging claim. Instead, the law requires evidence of actual or likely monopolization.²⁰ In 1993, Microsoft's unit share of application software for Windows/DOS operating systems was 44.6 percent for spreadsheets (Table 17-3) and 39.0 percent for word processors (Table 17-4). Given the state of competition in software application markets in the early 1990s, a legal challenge that Microsoft had leveraged its operating system monopoly into markets for application software likely would have been difficult to justify at that time.²¹ Of course, the law would not protect Microsoft from other conduct, such as the tying of the sale of operating systems to the purchase of application

TABLE 17-3
1993 Windows/DOS Spreadsheet Shipments

	Units (millions)	Share (%)
Microsoft Excel	3.3	44.6
Lotus 1-2-3	1.6	21.6
Borland Quattro Pro	1.0	13.5
Other	1.5	20.3
Total	7.4	100.0

Source: Computer Industry Forecasts, third quarter 1994, no. 39 (1994), p. 92.

¹⁸Whinston (1990) notes that a monopolist that sells a product that is complementary to other products does not have an incentive to foreclose entry into the complementary products. Whinston's model is highly simplified, and there are likely many reasons, including price discrimination and the erection of barriers to entry, why Microsoft may choose to extract supracompetitive profits from applications as well as operating system software.

¹⁹Note the crucial distinction in antitrust law and economics between effects on *competitors* and effects on *competition*. It is conceivable that Microsoft's control of the operating system has disadvantaged its competitors. However, this is not of primary concern if the conduct has not adversely affected competition among software developers and thus increased the quality-adjusted prices that consumers pay.

²⁰*Spectrum Sports, Inc. v. McQuillan*, 506 U.S. 447 (1993) (Section 2 [of the Sherman Act] makes the conduct of a single firm unlawful only when it actually monopolizes or dangerously threatens to do so). See Kattan (1994) and Blair and Esquibel (1995) for discussion of the legal doctrine of monopoly leveraging.

²¹Application markets did show signs of increasing concentration at that time. For example, Microsoft was enjoying a very large share of shipments of application suites (software bundles) in 1993.

TABLE 17-4
1993 Windows/DOS Word Processor Shipments

	Units (millions)	Share (%)
Microsoft Word	3.2	39.0
Word Perfect	3.7	45.1
Lotus Ami Pro	0.6	7.3
Other	0.7	8.5
Total	8.2	100.0

Source: Computer Industry Forecasts, third quarter 1994, no. 39 (1994), p. 92.

software, or predatory pricing, which courts have held are anticompetitive abuses of market power.

If analysis of Microsoft's conduct established that the company had unlawfully used its market power in operating systems adversely to affect competition in applications, the question remains whether feasible remedies exist to eliminate the anticompetitive effects. Microsoft's control of the operating system is an example of control over an input that is necessary for effective competition. Such inputs are sometimes called "bottle-neck" or "essential" facilities (if they are in fact essential to production). There are two basic approaches to deal with anticompetitive effects that may result from the control of such facilities, which I refer to as the "separation model" and the "conduct model."²²

The separation model has been applied in the deregulation of industries that possess natural monopoly assets. The consent decree in *U.S. v. AT&T* separated local telephone service, which was considered to have natural monopoly characteristics that required continued regulation, from long-distance service, for which competition was considered to be easier to achieve. In the natural gas industry, deregulation required pipeline companies to unbundle the sale of unregulated natural gas from the provision of regulated pipeline carriage. A similar approach is being followed in some electricity deregulation efforts that require the unbundling of the generation of electricity from the provision of transmission and distribution services. In the case of Microsoft, separation could take the form of a physical divorcement of Microsoft's operating system assets from its application program assets, similar to the divestiture by AT&T of its local telecommunications business.²³

The separation of operating systems from application programs would

²²See Gilbert and Shapiro (1996) for a discussion of the economic implications of compulsory access to essential facilities.

²³Separation of natural monopoly from competitive services, either functionally through governance rules or through corporate divestiture, does not eliminate the need for regulation, but rather changes the locus of regulation to the price of and conditions of access to the natural monopoly.

require intensive oversight. Basic questions such as “What is an operating system?” and “What is an application?” raise vexing legal and technical issues, and these are only necessary antecedents to ensure that access to the operating system is provided under nondiscriminatory terms. Moreover, the existence of regulation often provides opportunities for rent-seeking and strategic behavior that is contrary to the objective of economic efficiency.

The second approach to the control of bottleneck or essential facilities is the conduct model. The conduct model entails defining the boundaries of permissible conduct and information flows within the company in an attempt to control abuses from the control of the monopoly facility without requiring physical divorcement of those facilities. An example would be a requirement to maintain “firewalls” that constrain the flow of information between Microsoft’s operating system and application software activities. The antitrust agencies sometimes apply the conduct model in vertical mergers or joint ventures that pose competitive risks from control of bottleneck facilities, but for which structural separation is not a feasible remedy because it would negate the efficiency gains from the transaction.

As in the separation model, an effective conduct remedy would require diligent enforcement. If the boundaries of permitted conduct are not clear, rival firms can strategically manipulate enforcement of the decree to serve their own ends, sometimes with anticompetitive consequences. Similarly, a conduct decree may have anticompetitive consequences if the decree proscribes conduct that is necessary to achieve efficiencies.

THE BROWSER WARS

On October 20, 1997, the Department of Justice filed suit alleging that Microsoft violated certain provisions of the consent decree. Section IV(E)(i) of the consent decree prohibits Microsoft from entering into any operation system licence that is “. . . expressly or impliedly conditional upon the licensing of any other . . . product.” Microsoft required OEMs to license Microsoft’s Internet browser, called Internet Explorer, as a condition for obtaining a Windows 95 operating system license. The Department of Justice sought an injunction against Microsoft to cease this practice and sought damages of \$1 million for each day that the violation continued.²⁴

Microsoft’s defense focused on a part of Section IV(E)(i) that states “. . . this provision in and of itself shall not be construed to prohibit Microsoft from developing integrated products.” Microsoft argued that Windows 95 was designed to include Web browsing functionality and that

²⁴“Petition by the United States for an Order to Show Cause Why Respondent Microsoft Corporation Should Not Be Found in Civil Contempt,” *United States of America v. Microsoft Corporation*, U.S. District Court for the District of Columbia, Civil Action No. 94-1564. The DOJ also complained that Microsoft’s nondisclosure agreements deterred companies from providing information about Microsoft’s business practices to the government.

Windows 95 and the Internet Explorer are an integrated operating system software product, even if they can also be viewed as separate products.²⁵ The DOJ countered that Microsoft had packaged and marketed Internet Explorer as a separate product, and that the bundling of Windows 95 and Internet Explorer was a deliberate attempt by Microsoft to leverage its operating system monopoly to gain advantage over competing Web browsers, particularly Netscape's Navigator.²⁶ On December 11, 1997, Judge Jackson of the District Court issued a preliminary injunction ordering Microsoft to offer OEMs a Windows 95 product without the Internet Explorer.²⁷ Microsoft immediately appealed this order.

The DOJ's case raises issues that are larger than whether Microsoft's bundling of Internet Explorer and Windows 95 is in violation of the consent decree. Windows 98 (the next Windows upgrade) may escape the technical reach of the consent decree by including an Internet browser as an integral part of the operating system. However Windows 98 will not obviate competitive concerns about product bundling. Joel Klein, Assistant Attorney General of the Antitrust Division, made clear the weight of these issues by stating in connection with the consent decree complaint, "Even as we go forward with this action today, we also want to make clear that we have an ongoing and wide-ranging investigation to determine whether Microsoft's actions are stifling innovation and consumer choice."²⁸

Determining the boundaries of anticompetitive product bundling is crucial to competition policy, in the software industry and in other industries. Product bundling, whether it takes the form of a tie-in sale or the creation of an integrated product from previously separate products, raises competitive concerns typically addressed under the topic of monopoly leveraging.²⁹ The competitive issues raised by this type of conduct are extraordinarily complex, but we can be certain that Microsoft and the browser wars will stimulate new thinking on the subject.

CONCLUDING REMARKS

The Microsoft investigation attracted much attention for many reasons. It was a competitive inquiry into an industry that in little more than a decade

²⁵"Memorandum in Opposition to Petition of the United States for an Order to Show Cause Why Respondent Microsoft Corporation Should Not Be Found in Civil Contempt," *Op. Cit.* Microsoft also argued that permitting OEMs to choose whether or not to license Internet Explorer would destroy the benefits of a common operating system platform, in effect using network externalities to defend its licensing practices.

²⁶"Reply Brief of Petitioner United States of America," *Op. Cit.*

²⁷"Memorandum and Order," *Op. Cit.* (Dec. 11, 1997).

²⁸USDOJ press release, October 20, 1977.

²⁹These issues are addressed in other important antitrust cases such as *Jefferson Parish v. Hyde* and *ITS v. Kodak*. See discussion of these cases in Chapters 14 and 16 of this book, by William Lynk and by Jefferey MacKie-Mason and John Metzler, respectively.

metamorphosed from hobby toys into the engine of the modern information economy, with much of that growth under the direction and control of Microsoft. It is an industry characterized by network externalities, installed base effects, and increasing returns, all of which raise formidable challenges for the proper role of antitrust policy. For an antitrust case, it was high drama.

In the end, the consent decree negotiated between Microsoft and the Department of Justice was structured around a classical remedy to a narrow complaint. The allegation was that Microsoft had engaged in de facto exclusive dealing, which erected artificial barriers to entry by vendors of competing operating system products. Although Microsoft's "per-processor" license attracted the most public attention, this analysis suggests that the duration of Microsoft's licenses and the large minimum commitments were at least as important.

Those opposed to the proposed decree argued that it failed to address significant anticompetitive conduct by Microsoft and that it ignored the crucial features of increasing returns economics in the market for operating systems. With respect to the first point, the Department of Justice duly noted that the consent decree addressed only the conduct that was alleged in the complaint and that the settlement did not prevent the government from bringing a complaint on other conduct in the future. With respect to increasing returns, as Lopatka and Page (1995, p. 352) note, "For the amici, the theory [of network externalities] proves too much by establishing for them the inevitability of Microsoft's monopoly." There was no doubt as to the significance of increasing returns in this industry. The government's case was not predicated on the inevitability, or lack thereof, of the emergence of a single operating system standard for IBM-compatible PCs. Instead, the government drew a sharp distinction between whatever natural barriers to entry may exist in the industry and the artificial barriers to entry created by Microsoft's licensing practices. In a rather conventional application of the antitrust laws, the government crafted a complaint and reached a settlement that addressed these artificial barriers.

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