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Allen-Myland, Inc. v. Int.nat'l Bus. Mach. Corp

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UNITED STATES COURT OF APPEALS
FOR THE THIRD CIRCUIT

No. 93-1586

ALLEN-MYLAND, INC.,
Appellant

V.

INTERNATIONAL BUSINESS MACHINES CORPORATION

ON APPEAL FROM THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF PENNSYLVANIA
(D.C. Civil Action No. 85-06166)

Argued January 24, 1994

Before: MANSMANN and NYGAARD, Circuit Judges and
SEITZ, Senior Circuit Judge

(Opinion Filed August 12, 1994)

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OPINION OF THE COURT

NYGAARD, Circuit Judge.

Allen-Myland, Inc. ("AMI") appeals from the district court's judgment in favor of IBM in this intricate antitrust tying case. We conclude that the district court erred and will vacate its judgment and remand the cause for further proceedings.²

¹Amici consist of the Computer Dealers and Lessors Association, Inc., Digital Dealers Association, and National Association of Telecommunications Dealers.

²Although upon review we concentrate on errors, it is well to say at the outset that in a case that has been litigated as vigorously as this one, either finding facts or reviewing those findings for clear error is no easy task. The thirty-volume record on appeal contains 17,469 pages of court filings, trial and deposition transcripts, and exhibits. The district court, of course, was in even a more difficult position. Over 3.5 million pages of discovery documents were produced and 65 days of deposition testimony were taken. The trial transcript alone fills 1,750 pages, there were 2,750 pages of deposition testimony admitted, and there were no fewer than 734 trial exhibits.

I. FACTS and PROCEDURE

A. Mainframes and Upgrades

The facts underlying this nine-year-old dispute are minutely detailed and quite voluminous. The district court has set forth these facts in great detail in its forty-four page opinion, Allen-Myland, Inc. v. IBM Corp., 693 F. Supp. 262 (E.D. Pa. 1988), and we will present only a brief summary here.

IBM is the world's largest manufacturer of large-scale mainframe computers. These machines have the capacity to process millions of records at a time and manage a tremendous volume of information, making modern operations possible for large corporations, public utilities and government agencies. Without them, business would soon slow or halt. Mainframes are physically large machines, generally occupying significant floor space and requiring a full-time staff to keep them in operation. Needless to say, they are quite expensive, with prices commonly in excess of \$1 million.

Mainframes are available in a wide range of computing capacities, to fit the needs of each individual customer. One common measure of capacity is computing speed, measured in millions of instructions per second ("MIPS"). IBM mainframes may also be upgraded, as its customers' computing needs change over time, in what is known as a MIPS upgrade.

Many IBM mainframes are not purchased outright from IBM by their end users, but are instead leased through third-party leasing companies such as CMI and Comdisco.³ A mainframe will typically be leased to several end users during its life cycle, and then when obsolete will be scrapped. Often, when the lease term expires and the mainframe returns to the lessor, the computer will need to be reconfigured to meet the needs of the next lessee.

Companies like AMI found a profitable market reconfiguring mainframe computers such as the IBM 303X series.⁴ Lessors could not afford to have their machines idle and generating no revenue while waiting for a reconfiguration, yet IBM often took months to install an upgrade. AMI, on the other hand, would turn the job around in a matter of only a few days. Either AMI or the leasing company would buy the required parts outright from IBM for inventory on what were known as SWRPQ terms, meaning that IBM installation was not included. It would then install the parts in the user's computer, set up the appropriate software and test the system. Old parts could often then be used on another computer. Because the 303X series of computers was based on "MST" circuit board technology, which required significant technical skill and time to reconfigure, AMI was in a position to

³IBM itself is barred from leasing computers to end users under the terms of a 1956 consent decree entered into with the United States in another antitrust case.

⁴An "X" in an IBM model number indicates that several numerical designators may be used in that position, e.g., 3031, 3033.

add considerable value in terms of its labor. As a result, AMI grew into a company with \$50 million in annual revenue.

In 1980, however, IBM introduced its next generation of mainframe computers, the 308X series, which caused a major erosion in AMI's reconfiguration business. These machines used a new technology, the thermal conduction module, or TCM. A TCM is essentially a water-cooled can containing a much greater density of circuits than the system it replaced. Because more circuitry can be placed in a TCM, there are fewer TCMs to replace; hence, there is much less labor involved in performing an upgrade on a TCM-based computer than on earlier models.

In marketing its 308X series, IBM used a policy known as net pricing. Under this policy, IBM installation labor was bundled in with the price of the parts for TCM-based MIPS upgrades; SWRPQ pricing was either eliminated or was priced prohibitively high. In addition, any old TCMs recovered from a mainframe during reconfiguration became IBM's property. As a result, customers desiring non-IBM installation of upgrades were required to pay IBM's labor charge anyway. And because the net pricing policy limited the supply of the TCMs on the open market, acquiring parts from sources other than IBM became impractical.

IBM contended that net pricing's purpose was to insure that the old TCMs recovered from reconfigured machines were returned to IBM. TCMs are extremely durable and can easily be refurbished to "equivalent to new" condition. IBM, faced with a manufacturing capacity shortage, stated that it merely wanted to refurbish TCMs that were returned for later reuse in a future

upgrade or in a brand-new machine. As for bundling the labor charge, IBM contended its purpose was to ensure that it got its TCMs back, which was enhanced when IBM personnel performed the labor.

B. Procedural History

AMI, however, soon found that much of its reconfiguration business was drying up and filed this action. AMI's four-count complaint alleged that IBM violated sections 1 and 2 of the Sherman Act, 15 U.S.C. §§ 1, 2, and also asserted state law unfair competition and tortious interference claims. IBM counterclaimed for copyright infringement of its software programs and documentation manuals; IBM also asserted state law counterclaims for breach of contract and tortious interference.

AMI's section 1 claim was tried in a bench trial, contending that IBM had tied its upgrade installation services to the parts needed to perform the upgrades.⁵ AMI alleged that this tying arrangement constituted a per se violation of the Sherman Act; alternatively, it asserted that the tie was still a section 1 violation under the rule of reason.

The district court found that IBM's net pricing structure did not constitute a per se section 1 violation, for two reasons: first, that IBM's share of the relevant market was not high enough to impose per se liability, id. at 270-83; and second,

⁵In addition, AMI alleged that IBM's Installation and Warranty Service Charge (IWSC) constituted an unreasonable restraint of trade. The district court found for IBM on this theory, and AMI has not appealed from that finding.

that net pricing did not foreclose AMI from a "viable business opportunity," id. at 283-93. The court also found that net pricing did not violate section 1 under a rule of reason analysis because sufficient procompetitive reasons existed for it.⁶ Id. at 293-98.

Later, the district court tried most of the remaining claims and counterclaims, and concluded that AMI was liable to IBM for copyright infringement and violations of the Lanham Act. Allen-Myland, Inc. v. IBM Corp., 746 F. Supp. 520 (E.D. Pa. 1990).⁷ The court also entered judgment for IBM on AMI's Sherman Act section 2 claim, concluding that such a claim could not possibly succeed unless its earlier ruling on market power were reversed. Id. at 525 n.1, 559.

Meanwhile, IBM had filed another Lanham Act action against AMI in the United States District Court for the Northern District of Illinois, which was transferred to the Eastern District of Pennsylvania. Moreover, certain issues concerning IBM's relief against AMI on its counterclaims remained unresolved. On AMI's motion, the district court issued an order under Fed. R. Civ. P. 54(b) declaring that its 1988 opinion resolving the antitrust issues constituted a final judgment. Allen-Myland, Inc. v. IBM Corp., 1993-1 Trade Cas. (CCH) ¶ 70,244, 25 Fed. R. Serv. 3d

⁶The district court's decision under the rule of reason has not been appealed.

⁷AMI later moved for reconsideration, but that motion was denied. Allen-Myland, Inc. v. IBM Corp., 770 F. Supp. 1004 (E.D. Pa. 1991).

(Callaghan) 1353, 1993 WL 169849 (E.D. Pa. May 14, 1993). This appeal followed.

II. OVERVIEW of the LAW of TYING ARRANGEMENTS

The overarching issue in this appeal is AMI's claim that the district court erred when it found that net pricing was not a per se violation of section 1 of the Sherman Act. In a tying arrangement, the seller sells one item, known as the tying product, on the condition that the buyer also purchases another item, known as the tied product. Town Sound & Custom Tops, Inc. v. Chrysler Motors Corp., 959 F.2d 468, 475 (3d Cir.) (in banc), cert. denied, 113 S. Ct. 196 (1992). Section 1 of the Sherman Act declares only contracts in restraint of trade illegal. Thus, the antitrust concern over tying arrangements is limited to those situations in which the seller can exploit its power in the market for the tying product to force buyers to purchase the tied product when they otherwise would not, thereby restraining competition in the tied product market. Market power is defined as the ability "to raise prices or to require purchasers to accept burdensome terms that could not be exacted in a completely competitive market." United States Steel Corp. v. Fortner Enters., Inc. ("Fortner II"), 429 U.S. 610, 620, 97 S. Ct. 861, 867-68 (1977).

On the other hand, if the seller does not have sufficient power in the tying product market, buyers wanting to purchase the tied product from another source will simply avoid the tie by

buying the tying product from another supplier. See Town Sound, 959 F.2d at 476 (discussing Jefferson Parish Hosp. Dist. No. 2 v. Hyde, 466 U.S. 2, 11-14, 104 S. Ct. 1551, 1558-59 (1984)). Such a tie will not restrain an appreciable amount of trade, and accordingly, will not constitute an antitrust violation.

The first inquiry in any section 1 tying case is whether the defendant has sufficient market power over the tying product, which requires a finding that two separate product markets exist and a determination of precisely what the tying and tied product markets are. See Jefferson Parish, 466 U.S. at 21, 104 S. Ct. at 1562-63. If the defendant is found to have sufficient market power in the tying product market, then the tie may be a "per se" violation of the Sherman Act. This tie is condemned if the probability that the contractual arrangement improperly restrains trade is so high that a judicial inquiry into the actual prevailing market conditions, including possible procompetitive justifications for the tie, is deemed unprofitable. Id. at 15-18 & n.25, 104 S. Ct. at 1560-61 & n.25; Town Sound, 959 F.2d at 477.

Assuming the court finds sufficient market power, it must then decide whether "a substantial amount of interstate commerce" has been affected by the tie. See, e.g., Town Sound, 959 F.2d at 477. The Supreme Court has defined "substantial" in absolute dollar terms as an amount which is not de minimis in terms of the "total volume of sales tied by the sales policy under challenge" Fortner Enters., Inc. v. United States Steel Corp.

("Fortner I"), 394 U.S. 495, 501-02, 89 S. Ct. 1252, 1257-58 (1969) (\$190,000 sufficient).

Finally, to have standing to bring a private antitrust action, the plaintiff must show "fact of damage," defined as some harm flowing from the antitrust violation. Zenith Radio Corp. v. Hazeltine Research, Inc., 395 U.S. 100, 114 n.9, 89 S. Ct. 1562, 1571-72 n.9 (1969); Pitchford v. Pepi, Inc., 531 F.2d 92, 98-99 (3d Cir. 1975), cert. denied, 426 U.S. 935, 96 S. Ct. 2649 (1976). The amount of the damage is not important for antitrust standing; it is sufficient that some damage has occurred. There must, however, be some causal link between the damage and the violation of the antitrust laws. Put another way, the harm must be one that the antitrust laws were designed to prevent. Brunswick Corp. v. Pueblo Bowl-O-Mat, Inc., 429 U.S. 477, 488-89, 97 S. Ct. 690, 697 (1977).

III. SCOPE of the RELEVANT MARKET

A. Introduction

AMI asserts that the tying product is the "large-scale mainframe computer," defined as computers that are "among the largest in memory capacity, the fastest in computing speed, and the most expensive of computers available." Allen-Myland, 693 F. Supp. at 270-71. Alternatively, it sets forth two submarkets consisting of the parts and services required for the conversion and upgrade of either IBM mainframes or all manufacturers' mainframes. AMI defines the tied product as the labor required to install upgrades.

The district court found AMI's proposed market definition and submarkets to be too narrow. When the court broadened the market to include various substitutes that it believed shared cross-elasticity of demand⁸ with large-scale mainframes, IBM's market share dropped from as high as 79% to under 34.4%, too low to impose per se liability. See Jefferson Parish, 466 U.S. at 26-27, 104 S. Ct. at 1566 (30% market share insufficient); Times-Picayune Publishing Co. v. United States, 345 U.S. 594, 611-12, 73 S. Ct. 872, 882 (1953) (33-40% market share insufficient).

The court stated:

Standing alone, AMI's market share evidence tends to show that IBM enjoys substantial economic power. However, AMI's definitions of large scale mainframes and the relevant market are flawed in several respects and tend to overstate IBM's market share and power.

Allen-Myland, 693 F. Supp. at 271. The district court defined the relevant market to include not only large-scale mainframes, but also added upgrades to large-scale mainframes, leased and smaller capacity computers, peripheral products and software, "box swaps," and upgrades using customer-provided parts to the relevant market. To the extent that the district court's alleged errors were in formulating or applying legal principles, our review is, of course, plenary. We review the district court's findings of fact, however, under the clearly erroneous standard of review.

⁸ "The outer boundaries of a product market are determined by the reasonable interchangeability of use or the cross-elasticity of demand between the product itself and substitutes for it." Brown Shoe Co. v. United States, 370 U.S. 294, 325, 82 S. Ct. 1502, 1523-24 (1962).

B. Leasing Companies

The district court first added leasing companies into AMI's proposed market definition. It reasoned as follows:

Leasing companies, such as Comdisco and CMI, purchase computer equipment from manufacturers and lease it to users. From a consumer's standpoint, they are an alternative source of computer equipment. They compete with IBM. Leasing companies own approximately 40 percent of all large scale mainframe computers, as defined by AMI. Prof. Levin testified that IBM's share of the market would be reduced by an amount he was unable to determine if leasing companies were taken into account in AMI's market definition. If leasing company transactions involving computers comparable and in many cases identical to the large scale mainframes marketed by IBM are included in the relevant market, and the market is measured on a "transaction basis," IBM's share of the market, according to Prof. Almarin Phillips, who testified for IBM as an expert economist, drops to 34.4 percent. Prof. Phillips testified that such a share would not reflect "overwhelming" activity in the market on IBM's part.

Allen-Myland, 693 F. Supp. at 273-74 (footnote and record citations omitted). We cannot affirm the district court's finding that leasing companies form a part of the relevant market.

First, the district court relied on the testimony of Professor Levin, AMI's own expert, as an admission that IBM's market share would have to be reduced if leasing companies were added to the relevant market. This reliance is misplaced. Although Professor Levin did affirmatively answer the tautological question whether "leasing companies are competitors of IBM when they market IBM manufactured equipment in competition with IBM," this and our review of the trial transcript indicate

that he neither addressed the issue of market share reduction nor made an admission about it.

More importantly, we think that the opinion reveals an analytical flaw. Leasing companies lease both new and used computers. They purchase new mainframes from IBM and lease them to end users; when the lease term is up, if the mainframe is not obsolete and can be leased again, the leasing company will place it with another end user. In addition, leasing companies deal in both IBM and non-IBM computers. There are important legal and competitive distinctions between the various types of equipment in which the leasing companies deal, so they cannot be lumped together.

New computers are, of course, already in the relevant market as defined by AMI. It was therefore incorrect to add them in again when end users lease new computers rather than purchase them outright. In this situation, leasing companies provide nothing more than an alternate way of financing a new computer, but do nothing to increase the supply of new machines. See Transamerica Computer Co. v. IBM Corp. (In re IBM Peripheral EDP Devices Antitrust Litig.), 481 F. Supp. 965, 979 (N.D. Cal. 1979), aff'd, 698 F.2d 1377 (9th Cir.), cert. denied, 464 U.S. 955, 104 S. Ct. 370 (1983). They do not increase the number of new mainframes, as leasing companies still must purchase them from their manufacturers. Thus, to the extent that IBM had the power to set prices, that power would not be diminished, or at

most would only be slightly diminished,⁹ by its sales to leasing companies rather than end users. Since these purchases are already in the relevant market, it was double counting to also include them as part of the leasing market. Cf. id.

With respect to leases of used computers, there is a significant difference whether those machines were made by IBM or by some other manufacturer. Where used IBM computers are leased, we think that United States v. Aluminum Co. of America ("Alcoa"), 148 F.2d 416 (2d Cir. 1945)¹⁰ is apposite. There, Alcoa controlled 90 percent of the market for virgin aluminum ingot. It sought to reduce its market share for antitrust purposes by arguing that secondary ingot derived from scrap competed with virgin ingot for sales. The court held that because all secondary ingot was ultimately derived from virgin ingot, Alcoa, by properly exercising its power over the supply of virgin, could indirectly control the supply of secondary as well. Id. at 425.

⁹Conceivably, a few large, sophisticated buyers could place certain limits on even a dominant seller's power to set prices. There is no evidence that such pressure was applied here.

¹⁰Although Alcoa was decided by the United States Court of Appeals for the Second Circuit, the procedural circumstances under which it reached that court give it added weight as precedent. Under the then-existing version of 15 U.S.C. § 29, appeals from the decrees of district courts in antitrust cases where the United States was a complainant would lie only to the Supreme Court. In Alcoa, however, a sufficient number of justices were recused that a quorum could not be obtained; accordingly, the Supreme Court, pursuant to the above statute, remanded the case to the three most senior judges of the Second Circuit: Learned Hand (the author of Alcoa), Augustus N. Hand, and Swan. The Supreme Court itself has recognized the special weight of the Alcoa opinion. See American Tobacco Co. v. United States, 328 U.S. 781, 811-13 & n.10, 66 S. Ct. 1125, 1140 & n.10 (1946).

Alcoa's analysis is persuasive. Indeed, we think the case is even stronger here for excluding the secondary market. Refined aluminum can be melted down and reused repeatedly, and in any event, products made with it may last for decades before they are scrapped and the aluminum is recycled. It therefore may have been quite difficult for Alcoa to estimate future supply and demand for aluminum ingot over a long period of time with sufficient accuracy to maximize its profits by manipulating the supply of virgin ingot it produced. See 2 Phillip Areeda & Donald F. Turner, Antitrust Law § 530c (1978).

Computers, however, have considerably more limited lives than aluminum ingot. Technology and price/performance ratios have been advancing so rapidly in the computer industry that used machines cannot be re-leased indefinitely.¹¹ Accordingly, a powerful manufacturer like IBM was in a position to maximize its profits by carefully controlling the number of mainframes that would later appear on the used leasing market. This is particularly true when, as here, that control was enhanced by IBM's policy of recapturing old parts that could otherwise have

¹¹Moreover, IBM's net pricing and parts recapture policies further reduced whatever control the leasing companies might have had over the prices of used equipment. By recapturing old parts from upgraded mainframes, IBM effectively curtailed the leasing companies' ability to reconfigure their used machines into different models that could have competed against IBM's offerings over the medium term. This effect is similar to that caused by IBM's past practices of offering tabulating and computer equipment only for lease and not for sale. These practices also spawned antitrust litigation, resulting in a 1935 injunction and a 1956 consent decree. See Control Data Corp. v. IBM Corp., 306 F. Supp. 839 (D. Minn. 1969), aff'd, 430 F.2d 1277 (8th Cir. 1970).

been used to extend the useful service lives of existing used mainframes by allowing them to be upgraded and placed with new customers. We therefore conclude that the district court erred when it added leases of used IBM mainframes into the relevant market.¹²

On the other hand, to the extent that leasing companies deal in used, non-IBM mainframes that have not already been counted in the sales market, these machines belong in the relevant market for large-scale mainframe computers. Unlike IBM, there is no allegation that the manufacturers of these computers possess the market power to control prices, much less that they would do so in concert with IBM.¹³ When these computers are placed in service by leasing companies, they provide an alternative that limits IBM's power in the market.¹⁴

¹²We also disagree with the district court's view that AMI admitted that leasing companies "compete with IBM and constrain IBM's ability to set prices or exclude competition in the market for new large scale main frame computers." Allen-Myland, 693 F. Supp. at 274. The district court cited AMI's proposed finding of fact 29 in support of its conclusion, but AMI asserted only that IBM and lessors compete in the placement of mainframes with end users; in other words, IBM installs computers, and so do Comdisco and CMI. This does not constitute an admission on market cross-elasticity or the scope of the relevant market.

¹³Indeed, the so-called "plug-compatible manufacturers" have built their businesses around providing mainframes and peripherals compatible with, but in competition with those of IBM.

¹⁴This holds most true for plug-compatible mainframes. There is actually a considerable question to what extent non-compatible computers are a realistic short-run alternative for a customer whose computer software and data are tailored to IBM mainframes. We do not reach the issue, however, as Allen-Myland is constrained by its own definition of the market as "large scale mainframe computers," regardless of manufacturer or

Accordingly, we conclude that the district court erred when it included all leasing company transactions in the relevant market. On remand, the court should include only leases of used, non-IBM mainframes and determine the extent to which those leases reduce IBM's market share.

C. Box Swaps

The district court also added "box swaps" -- replacing an existing computer with a more powerful, new or used computer -- into the relevant market, although it did not calculate the degree to which these box swaps eroded IBM's market share.

The analytical problem with this finding is similar to the error with respect to leasing companies. To the extent that a box swap involves purchasing a new IBM or a new or used non-IBM mainframe computer, it constitutes double counting to add box swaps to the market because those sales are already included in the market definition. On the other hand, if a used IBM computer is used in the swap, then to include that machine in the market is incorrect under Alcoa for the same reason it was error to include them in the leasing market.

D. Used Parts Upgrades

Including "used parts upgrades" in the relevant market was also error. A used parts upgrade is an upgrade performed with parts obtained from another computer, either one belonging to the

compatibility. See Edward J. Sweeney & Sons, Inc. v. Texaco, Inc., 637 F.2d 105, 117 (3d Cir. 1980) (antitrust plaintiff held to theory advanced in district court), cert. denied, 451 U.S. 911, 101 S. Ct. 1981 (1981).

organization needing the upgrade or one belonging to a leasing company. See Allen-Myland, 693 F. Supp. at 277.

The district court correctly recognized that the viability of used parts upgrades could be limited by the scarcity of the necessary parts. It then relied on the many memory and channel upgrades and downgrades that had been performed with used parts not acquired from IBM. The record indicates, however, that most memory and channel upgrade parts are not based on TCM technology and were thus not subject to IBM's net pricing and parts recapture policies. The parts required for MIPS upgrades, however, were mostly TCM-based and subject to net pricing and recapture. Thus, that other non-net priced parts were readily available does not support the implicit conclusion that there was no scarcity of MIPS upgrade parts.

Even if used parts were available to perform MIPS upgrades, the record does not suggest any manufacturer of those parts other than IBM. Hence, the reasoning of Alcoa is as controlling here as it was for used IBM computers. To the extent that IBM controls the supply and price of the new mainframes from which upgrade parts must be salvaged, it has the power to indirectly control those upgrades as well. Accordingly, it would have been error to include used parts upgrades in the relevant market even if parts had been available.

E. Smaller Capacity Computers

The district court considered AMI's proposed market definition to be too narrow because it failed to include "smaller capacity computers" -- computers below the size and

sophistication of a large-scale mainframe that nevertheless would be reasonable substitutes, either singly or in combination. See Allen-Myland, 693 F. Supp. at 274-75. AMI argues that it was error for the district court to include these smaller machines because there was not sufficient evidence of substitutability between these two types of computers. The district court rejected AMI's argument, citing evidence that smaller computers had effectively displaced mainframes in certain applications and noting a trend toward the replacement of large, centralized systems with "distributed" systems consisting of greater numbers of smaller capacity computers. Id.

AMI argues on appeal that this reasoning was flawed because it failed to consider the rapid development of technology over the life cycle of a typical computer. It agrees that some installations that initially required older generation mainframes might be satisfied with "smaller" machines when it came time to replace their mainframes, because the smaller machines would by then have all the power of the earlier mainframes. Nevertheless, AMI contends, the fact that some users of older mainframe computers might switch to smaller capacity machines proves nothing about whether those smaller machines effectively compete against IBM's current, more powerful mainframes, which are the focus of this litigation. AMI's argument is sound, but unavailing. There was testimony admitted at trial indicating that at least one smaller capacity computer, the Hewlett-Packard HP 3000 series, competed against the IBM 308X series "in many

applications." The district court was entitled to, and did, credit this evidence. Allen-Myland, 693 F. Supp. at 275.

The amici argue that the district court failed to consider the problem of "lock-in." Although mainframes and smaller capacity computers may be substitutable when a new computer application is being developed or when an existing application is no longer useful and must be rewritten anyway, they argue that there are significant switching costs that prevent this from happening in the short run. For example, to "port" an existing application from a mainframe to a smaller computer, the applications software may have to be rewritten, the data files may have to be converted to new formats, and personnel may have to be extensively trained on the new system. The costs of doing so and the delay involved could well cause the computer user to remain with a mainframe-based system rather than convert to a smaller computer; indeed, one court has noted that, for compatibility reasons, over 80 percent of users remain loyal to the manufacturer of their original systems. See Transamerica, 481 F. Supp. at 980 & n.32.

Ordinarily, we would not consider this argument because it was not raised in the district court. This case, however, is unusual in that the district court reached its decision in 1988, but the antitrust issues did not become final and appealable until 1993. During that hiatus, the Supreme Court issued its decision in Eastman Kodak Co. v. Image Technical Servs., Inc., 504 U.S. _____, 112 S. Ct. 2072 (1992). Because Kodak is directly relevant to the lock-in argument and the district court never had

the opportunity to consider the effect of that case, we would be remiss if we did not analyze the issue now.

Eastman Kodak manufactured photocopying equipment that it sold in a competitive market. According to the plaintiffs, who provided service and repair to those copiers, Kodak sought to maintain control over service by restricting the availability of necessary repair parts. Although Kodak argued that it did not have sufficient market power to restrain trade because the market for new copiers was competitive, the Supreme Court held that, under certain circumstances, the fact that the buyer of such equipment was locked into a single supplier could give rise to a finding of market power:

If the cost of switching is high, consumers who already have purchased the equipment, and are thus "locked-in," will tolerate some level of service-price increases before changing equipment brands. Under this scenario, a seller profitably could maintain supracompetitive prices in the aftermarket if the switching costs were high relative to the increase in service prices, and the number of locked-in customers were high relative to the number of new purchasers.

Id. at 2087.

The situation may be analogous here. If it is prohibitively expensive to switch to a smaller capacity computer before the normal end of an application system's life cycle, then IBM, at least for those locked-in customers, would not face any realistic competition from smaller machines and would thus possess market power as if they did not exist.

The district court cited several anecdotes in the record suggesting that smaller machines are vigorously competing with

large-scale mainframes and are often winning out over them. Our review of the record, however, shows that in none of the incidents mentioned was there a mainframe user with a significant base of applications software and data that would have to be rewritten and converted before the application could be moved to a smaller computer. Indeed, in the vast majority of cases, the customer was developing a new application and had an unfettered choice of which type of computer to purchase. In a few others, the system was approaching the end of its useful life and was slated for replacement. This evidence, then, does not support the conclusion that there was not a significant lock-in problem.

Nevertheless, this remains an issue of fact for the district court to resolve in the first instance. However, whether to consider new issues on remand is not for us to determine, but is properly a matter for the district court's discretion as presider over subsequent proceedings. Therefore, we express no view on whether the district court should permit a new argument to be pursued at this stage of the litigation. The district court may conclude, for example, that allowing AMI to pursue a new theory not raised until after discovery and the completion of an entire trial would result in undue prejudice to IBM. See Habecker v. Clark Equipment Co., 942 F.2d 210, 218 (3d Cir. 1991). We hold only that the determination whether to consider the lock-in argument, to permit further discovery on the issue, and to hear

additional evidence are all within the district court's sound discretion.¹⁵ See id.

F. Peripheral Devices and Software

AMI also argues that the district court erred when it added peripheral devices and software into the relevant market. The court found that these items, which provide data input, storage and output capabilities and direct the computer in its processing of information, "provided significant and reasonable alternatives to a wide variety of upgrades and modifications of large scale mainframes." Allen-Myland, 693 F. Supp. at 276.

Similar or substitute products are those that "have the ability -- actual or potential -- to take significant amounts of business away from each other." SmithKline Corp. v. Eli Lilly & Co., 575 F.2d 1056, 1063 (3d Cir.), cert. denied, 439 U.S. 838, 99 S. Ct. 123 (1978). Thus, the relevant product market "is composed of products that have reasonable interchangeability for

¹⁵If it does so, the district court should then proceed to determine the percentage of the mainframe market occupied by existing mainframe users who are locked in to that type of computer by prohibitively high switching costs; the greater that percentage is, the more power IBM has to maintain supracompetitive prices in the mainframe market. See Phillip E. Areeda & Herbert Hovenkamp, Antitrust Law ¶ 521.1a, at 604-05 (1993 Supp.). The court can then determine if IBM's power in the large-scale mainframe market is constrained by the existence of smaller capacity computers, and if so, whether such computers should be included in the relevant market. It may be that the district court will conclude that, while smaller capacity computers cannot be fully excluded from the market, neither can they be fully included. The court may, after considering the evidence and the nature of the market, exercise its discretion and reduce IBM's market share by a number greater than zero percent but less than the full extent of the market for smaller capacity computers.

the purposes for which they are produced -- price, use and qualities considered." Id. at 1062-63 (quoting United States v. E.I. du Pont de Nemours & Co., 351 U.S. 377, 404, 76 S. Ct. 994, 1012 (1956) (The Cellophane Case)); Tunis Bros. Co. v. Ford Motor Co., 952 F.2d 715, 722 (3d Cir. 1991), cert. denied, 112 S. Ct. 3034 (1992).

"Interchangeability" implies that one product is roughly equivalent to another for the use to which it is put; while there might be some degree of preference for the one over the other, either would work effectively. A person needing transportation to work could accordingly buy a Ford or a Chevrolet automobile, or could elect to ride a horse or bicycle, assuming those options were feasible. The key test for determining whether one product is a substitute for another is whether there is a cross-elasticity of demand between them: in other words, whether the demand for the second good would respond to changes in the price of the first. Tunis Bros., 952 F.2d at 722.

In the six years since the district court issued its opinion, the personal computer has consolidated its position in modern life, and what once seemed mired in impenetrable technical jargon is now within the vocabulary of the general public. Moreover, technology changes rapidly and if one has an older computer and wishes to use the latest software applications, one often must either upgrade the central processor -- the equivalent of a MIPS upgrade -- or buy a new computer. Increasing the size of the disk drive, buying more memory or installing the latest version of the operating system may help in some cases but in

many others will be ineffective. It thus may be argued that the same situation obtains in the case of larger computers; that is, peripherals and software are complementary goods but are not substitutes for mainframe computers.

The issue, nevertheless, remains a factual one for the district court to resolve. Here, if peripherals and software are reasonable substitutes for mainframes, we should expect to see an increased demand for them as the price of mainframes rises, but the district court cited no evidence of this type. Instead, it relied on the fact that IBM considers peripheral products and software when pricing its computer systems. Allen-Myland, 693 F. Supp. at 276. Pricing a large mainframe system on the basis of peripherals included with it against competitive offerings by other manufacturers, however, is simply not evidence that peripherals and mainframes are substitutes for one another.

The district court relied even more heavily on several anecdotes in which large mainframe users had upgraded memory, disks, software or other peripherals rather than perform a MIPS upgrade. Id. at 276-77. This testimony fell into two categories. First, some users testified that it was possible to delay a MIPS upgrade for a while by upgrading peripherals or software: akin perhaps to saying that installing new brakes may delay the necessity of purchasing a new car, but it is not sufficient evidence on which to conclude that the products are reasonably interchangeable in use. See Kaiser Aluminum & Chemical Corp. v. Federal Trade Comm'n, 652 F.2d 1324, 1331-32 (7th Cir. 1981) ("specialties," which delayed the necessity of

replacing refractory bricks in furnaces, did not belong in the same relevant market).

Second, there was testimony to the effect that there are many ways to enhance the performance of a computer system, including MIPS upgrades and peripheral/software upgrades. Although it is doubtless true that improvements to peripherals or software will improve a computer's performance somewhat under certain circumstances, we find no evidence on how much or under what conditions improvement could be expected. There was thus no evidence from which to conclude whether peripheral and software upgrades were reasonably interchangeable with either a MIPS upgrade or a different mainframe computer in enough cases that those alternate upgrades could properly be termed substitutes. Nor was there evidence that, because of a price change in mainframes, there was a greater or lesser demand for peripheral/software upgrades. In sum, the evidence was insufficient to support the wholesale inclusion of peripherals and software into the relevant market for large-scale mainframes.

We emphasize, however, that we are not holding that peripheral and software must be excluded from the relevant market, only that, upon review, the evidence cited in the district court's opinion is insufficient to warrant including them. On remand, the district court will of course determine whether there is some degree of interchangeability or other evidence of cross-elasticity of demand. If there is, then the court is free to adjust IBM's share of the market by its best estimate of the true competition from peripherals and software.

G. AMI's Proposed Submarkets

As a separate ground for reversal, AMI argues that the district court erred by rejecting its two alternate submarkets: the parts and services required for the upgrade and conversion of all large-scale mainframes, and an even narrower submarket confined to parts for upgrading IBM mainframes. The district court rejected the larger submarket based on evidence that upgrades to large-scale mainframes competed with various alternatives, including large-scale mainframes themselves. Allen-Myland, 693 F. Supp. at 282-83. It rejected the narrow submarket because "[c]ourts have generally rejected market definitions limited to a defendant's products." Id. at 282 n.43.

In Brown Shoe Co. v. United States, 370 U.S. 294, 325, 82 S. Ct. 1502, 1524 (1962), the Supreme Court stated that within a broader product market "well-defined submarkets may exist which, in themselves, constitute product markets for antitrust purposes."¹⁶ Thus, if upgrades and mainframes are not reasonably interchangeable with each other, a valid submarket would exist here. The district court, however, found that replacing the

¹⁶The use of the term "submarket" is somewhat confusing, and tends to obscure the true inquiry: whether IBM is constrained by the prices of large scale mainframe computers when pricing its upgrades. If it is so constrained, then the relevant market consists of both mainframes and upgrades. If not, then it is simpler and more accurate to say that the relevant market itself, not some submarket of it, contains only upgrades. See Areeda & Hovenkamp, supra, ¶ 581.1c, at 535-36 (1993 Supp.). Nevertheless, because the term has been commonly used in the reported cases over the years, we will also continue to use it, being nonetheless mindful that it is inaccurate and of the true question before us.

computer itself is an alternative to an upgrade. Moreover, it found that IBM priced upgrades and mainframes so that buyers would be indifferent whether to purchase an upgrade or install a more powerful computer. These factual findings are not disputed on appeal, and so the district court's conclusion on the larger submarket must stand. By implication, if the broader submarket fails, the narrower one would appear to fail as well.

Instead of arguing that the district court's factfinding was clearly erroneous, AMI attempts to revive its narrow submarket by relying on the testimony of its expert, Professor Levin, that certain IBM mainframe users were locked into upgrading their computers and lacked the alternative of replacing the whole machine. By so arguing, it attempts to bring this issue within the ambit of Kodak, which was decided four years after the district court's opinion in this case.

In Kodak, as we have already discussed, the Supreme Court held that when users are locked into a particular vendor by the sunk cost of the product, market power may exist in the aftermarket for parts even though the equipment market is competitive. Here, while the district court found that large-scale mainframes were generally reasonable substitutes for upgrades, its opinion did not address whether there was a subpopulation of IBM mainframe users who for economic reasons were locked into MIPS upgrades when they needed increased computing power. AMI's argument appears to be that if a sufficient number of users actually were locked into using upgrades rather than replacing their computers, then IBM may have

had the power to set prices for MIPS upgrades, wholly separate from whether it possessed that power over the large-scale mainframe market, including upgrades. Under this reasoning, we should remand and allow the district court to determine the extent, if any, to which this was the case.

Such a remand would be futile, however, since if IBM had market power over upgrades with respect to a large number of mainframe users, we would expect it to charge supracompetitive prices for upgrades. Yet, the district court found that IBM prices its upgrades such that the user pays the same amount for an upgrade as the price differential between the prices of the more powerful and the existing computers if purchased new. Allen-Myland, 693 F. Supp. at 282. This belies any special power over an upgrade submarket; IBM's power is limited to whatever control it is able to maintain over the larger relevant market. Hence, we will affirm the district court's finding that a valid IBM-only parts submarket did not exist.

H. The "Significant Win/Loss Reports"

Additionally, AMI argues that the district court improperly rejected one of its strongest pieces of evidence in support of its proposed market definition, the "Significant Win/Loss Reports," also known as the SWLRs. These reports were prepared monthly for the top management of IBM and showed, for each competitive situation IBM faced, IBM's product offering, the offering of its competitors, and whether IBM won or lost the sale. See Allen-Myland, 693 F. Supp. at 272. According to the testimony of AMI's expert who reviewed the SWLRs (Professor

Levin), in 97.6 percent of the reported cases in which the IBM offering was a large-scale mainframe, the competitor's offering was also a large-scale mainframe or an upgrade. AMI asserts that these reports proved that a distinct product market for large-scale mainframe computers exists.

The district court rejected this evidence for several reasons. First, it noted that IBM itself viewed the SWLRs as "poor and unrepresentative indicators of actual market activity" and eventually stopped using them. Id. at 273. In the alternative, it relied on the SWLRs themselves, which contained many examples in which non-IBM mainframes competed against IBM computers smaller than IBM mainframes. The district court believed that this additional competition undermined AMI's definition of the relevant market.

Reports such as the SWLRs, which are used by IBM's management, can be powerful evidence in an antitrust case. In United States v. United Shoe Machinery Corp., 110 F. Supp. 295, 304 (D. Mass. 1953), aff'd per curiam 347 U.S. 521, 74 S. Ct. 699 (1954), the court stated:

When a business allows its own important judgments constantly to be affected by a statistical survey unflaggingly made, diligently kept current, and repeatedly consulted at least by subordinate advisers to the officers, then the statistical material may be used by a court to some degree as reliable evidence against the business.

Nevertheless, notwithstanding the potentially probative value of this type of evidence, there is nothing that requires courts to credit such evidence. Here, as the district court pointed out,

the record shows that IBM itself found the SWLRs were unreliable. As the trier of fact, the district court was entitled to credit that testimony and reject the SWLRs.¹⁷ Based on our conclusions about the relevant market and the various additions to it, however, it is possible that the district court may wish to reconsider the probative value, if any, of the SWLRs. On remand, of course, it is free to do so.

IV. OTHER FACTORS BEARING ON MARKET POWER

Market share, of course, is only one type of evidence that may prove the defendant has sufficient market power to impose per se antitrust liability. "Market share is just a way of estimating market power, which is the ultimate consideration. When there are better ways to estimate market power, the court should use them." Ball Memorial Hosp., Inc. v. Mutual Hosp. Ins., Inc., 784 F.2d 1325, 1336 (7th Cir. 1986). The district court, in addition to its findings on market share, also held that the lack of entry barriers and the rapid technological change of the computer industry independently precluded any finding of market power.

¹⁷We do not accept the district court's alternative reason for discrediting the SWLRs. Although it may well be true that in some circumstances non-IBM mainframes competed with smaller IBM computers, we must be aware of the true market inquiry in an antitrust tying case: can the defendant exercise market power over the tying product to restrain trade in the tied product market? Although the above evidence could lead to the conclusion that the relevant market here is somewhat broader than mainframes only, a user seeking to avoid IBM's tie needs an alternative to an upgrade or a computer of the type it currently has installed. To the extent that the user needs more computing power, a smaller IBM computer would not appear to be much of a substitute.

A. Ease of Entry Into the Relevant Market

Notwithstanding the extent of an antitrust defendant's market share, the ease or difficulty with which competitors enter the market is an important factor in determining whether the defendant has true market power -- the power to raise prices.

In many cases a firm's share of current sales does indicate power. . . . In other cases, however, a firm's share of current sales does not reflect an ability to reduce the total output in the market, and therefore it does not convey power over price. . . . [T]he lower the barriers to entry, and the shorter the lags of new entry, the less power existing firms have. When the supply is highly elastic, existing market share does not signify power.

Id. at 1335.

The district court relied on three pieces of evidence that purportedly showed that competitors were relatively free to enter the relevant market. First, it noted:

A number of companies other than IBM manufacture a wide range of computers having the processing power of IBM large-scale mainframe computers. Several of these (including Digital Equipment Corporation, Data General, Hewlett Packard, Tandem, and NCR) were admittedly excluded from the report upon which Prof. Levin relied to determine what constitute large-scale mainframes.

Allen-Myland, 693 F. Supp. at 278.

This statement is somewhat ambiguous. First, we have already noted that the district court may wish to reconsider the issue of whether the relevant market includes the smaller capacity computers these manufacturers produce in light of the Supreme Court's opinion in Kodak. Thus, to the extent the court finds on remand that these computers do not belong in the relevant market, its conclusion will have to be re-evaluated.

More importantly, the district court's reasoning conflates ease of entry into the market with what belongs in the relevant market in the first instance. Even if all the computers made by these manufacturers were properly included in the market, that would say nothing about how easy or difficult it currently is to enter the market. It is conceivable that all these firms have been in the market for many years and that there has been very little recent entry. To use an example from another industry, just because there may be a sizable number of steelmakers of various sizes and specialties, that does not necessarily make it easy to build a steel mill and enter the business today. Accordingly, the district court's finding of ease of market entry is not supported by the mere presence of these manufacturers of smaller capacity computers.

Second, the district court relied on the recent growth of leasing companies as evidence that the market was easy to enter. Again, we have already held that, except for certain leases of used, non-IBM computers, leasing companies do not belong in the relevant market. Because of this, the ease of entry into the leasing market is legally irrelevant; if IBM has market power over the supply of large-scale mainframes, the immediate entry into the market of these essentially financial intermediaries can do nothing to increase the supply of such computers. Accordingly, leasing companies prove nothing about ease of entry into the relevant market here.

Finally, the district court cited the relative ease of entry into the computer reconfiguration business itself as evidence of

a lack of barriers to market entry. The question, however, in an antitrust tying case is whether the defendant can use its power over the tying product market to control the tied product market as well. If IBM has market power over large-scale mainframes (including upgrade parts), that power could not be curtailed even to the slightest degree by the fact that it is easy to enter the tied market of installing upgrades. Indeed, it seems likely that in most if not all tying cases, the tied product market will be competitive, otherwise the defendant would have no reason to impose the tie and restrain competition in the first place.

Accordingly, because the district court's reasons for finding ease of entry into the relevant market were erroneous, its finding that ease of entry vitiated IBM's market power cannot stand.

B. Technological Innovation and Declining Prices

The district court also believed that market power was inconsistent with the fact that technology in the computer industry was rapidly advancing.

Although the performance of computers has been rapidly increasing as costs for performance have plummeted, it proves too much to say that this improvement is inconsistent with market power. Indeed, in Greyhound Computer Corp. v. IBM Corp., 559 F.2d 488, 497 (9th Cir. 1977), cert. denied, 434 U.S. 1040, 98 S. Ct. 782 (1978), another antitrust action brought against IBM and relied upon by the district court, the court stated:

IBM also contends that price reduction and product improvement are characteristics of the industry and are inconsistent with the existence of monopoly power. But

rapid technological progress may provide a climate favorable to increased concentration of market power rather than the opposite. Moreover, a decline in prices does not necessarily imply an absence of monopoly power; a fair profit might have been made at even lower cost to users.

559 F.2d at 497 (footnote omitted) (citing Alcoa, 148 F.2d at 427). Indeed, were we to accept the district court's reasoning, a great many defendants with market power, such as Alcoa in the 1920s and perhaps even the former AT&T telephone monopoly, could be insulated from antitrust attack. Here, technology was improving and prices were steadily falling, but the district court cited no evidence that these changes had any connection with a decrease in IBM's market power. We hold that the district court erred when it ruled that innovation and price reductions precluded a finding of market power.¹⁸

C. Conclusion

Accordingly, we will vacate the district court's finding that IBM lacked sufficient market power for per se antitrust liability and remand for further proceedings, during which the district court should re-examine the issue de novo.

V. "VIABLE BUSINESS OPPORTUNITY"

In addition to finding that IBM lacked sufficient market power for per se liability to be imposed on it, the district court also found that AMI had not been foreclosed from a "viable business opportunity" by IBM's net pricing policy. Allen-Myland,

¹⁸We do not, however, hold as a matter of law that price reductions and technological improvements can never evidence a lack of market power. Each case must be decided on its own facts, and facts must be found on the evidence presented.

693 F. Supp. at 283. The court found that the labor-saving advantages of TCM technology changed what had once been a lucrative reconfiguration business involving a great deal of added value into one whose labor content had become de minimis, averaging only 1.2 percent of the net upgrade price. Id. According to the district court, because AMI would be required to inventory a supply of upgrade parts in order to compete with IBM, its carrying costs would be so high in comparison to its projected revenues from performing upgrades that AMI would have actually lost over \$35 million if IBM had provided upgrades on non-net priced (SWRPQ) terms. Id. at 288. Accordingly, because the antitrust laws protect competition rather than competitors, the court held that net pricing was not worthy of condemnation under the antitrust laws.

There is no requirement that one be deprived of a "viable business opportunity" to recover under section 1 of the Sherman Act. We instead interpret the district court as holding that AMI failed to prove the following two prongs of the orthodox framework for a section 1 tying case: first, that two separate markets existed for the tying and tied products; second, that a substantial volume of interstate commerce was affected by the tie. Additionally, the district court's analysis appears to bear on the "fact of damage" issue of whether AMI has standing to bring a private antitrust suit against IBM.

A. Separate Product Markets

In Jefferson Parish, the Supreme Court said that, in a tying case, "the answer to the question whether one or two products are

involved turns not on the functional relation between them, but rather on the character of the demand for the two items." 466 U.S. at 19, 104 S. Ct. at 1562. It then went on to hold that a tying arrangement cannot exist unless there is a sufficient demand for the purchase of the tied product separate from the purchase of the tying product so as to identify a market structure in which it is efficient to offer the tied product separately from the tying product. Id. at 21-22, 104 S. Ct. at 1563. There, the tying product was hospital services and the tied product was anesthesiological services; because on the facts presented, there was evidence of separate patient demands for specific anesthesiologists, the Court held that separate markets existed. Id. at 22, 24, 104 S. Ct. at 1564-65.

At least at one time, there was a demand for third-party installations of upgrades separate from the demand for parts; the successful operation of AMI's business before IBM imposed its net pricing policy is conclusive evidence of that. The district court, however, believed that TCM technology, not net pricing, destroyed the separate market for AMI's labor, finding: (1) that customers would not be willing to have upgrades installed by AMI at any price higher than what IBM would charge if forced to provide the service; and (2) that, at the IBM price, AMI would lose massive amounts of money if it attempted to install upgrades in the same way as before net pricing. Allen-Myland, 693 F. Supp. at 283-91.

1. Customer Willingness to Pay Premium Prices

The district court credited the testimony of end-user witnesses who said they had no interest in having upgrades installed by a third party such as AMI. It then went on to acknowledge that representatives of leasing companies did indicate an interest in third-party installation, but only at prices competitive with IBM's net price. Id. at 290.

The court properly found that, with a few adjustments, IBM would charge \$165 per hour for installing upgrades. Id. at 287. AMI takes strong exception to the next logical step in the court's reasoning: that AMI would not be able to charge its customers any more than IBM for its services. We are convinced by AMI's argument.

At trial, two leasing company witnesses testified that they would not be interested in paying AMI significantly more than IBM's effective hourly rate for installation of upgrades. Comdisco's Mr. Lewis said that he would use AMI installation service only if it were, at most, slightly more expensive than IBM's price. Id. at 291. On cross examination, however, he admitted that AMI had performed an "E to B" upgrade at an effective hourly rate of \$2,400 and admitted that such an amount (thought by counsel to be \$1,500 per hour) was more than slightly greater than IBM's price. See id. at 291 & n.75. The district court, irrespective of this contradiction, opined:

Mr. Lewis of Comdisco explained that he would use AMI installation service only if it were "lesser than, the same as, or in rare exceptions, only a slight premium above the prevailing IBM list price." Using an E to B upgrade as an example, Mr. Lewis testified that he would not regard an AMI hourly rate of \$1500 for

installation service as only slightly greater than an IBM hourly rate of \$180 or \$200.

Id. at 291 (record citation omitted). In a footnote, the court continued:

Using customer-owned parts, AMI charged Comdisco between \$25,000 and \$30,000 for installing an E to B upgrade, requiring approximately 20 man hours. Based on Mr. Ross's calculations, the value of IBM installation service for an E to B upgrade, requiring about 13 man hours of labor, is \$2,400. Based on these facts and Mr. Lewis' assertions, it is fair to conclude that Comdisco would not select AMI over IBM to install a new E to B upgrade if it had the choice. In view of this evidence, I do not accept AMI's assertion at closing argument that leasing companies "don't care whether the service costs \$2400 or \$20,000."

Id. at 291 n.75 (record citations omitted). We conclude that this finding, at least as supported by the district court's opinion, is clearly erroneous. The court did not adequately address why, if Comdisco was unwilling to pay anything more than a slight premium over IBM's rate, it paid not \$165 per hour, but a full \$2,400 hourly rate. Its statement, that Comdisco would never pay the \$2,400 rate if it "had the choice," is true enough, but explains nothing; we would all like to pay the lowest possible price whenever we purchase goods and services. On the other hand, AMI's explanation for its ability to charge a higher price is supported: IBM commonly took so long to price and perform upgrades that the leasing companies' losses from having their machines idle exceeded the premium charged by AMI -- which was often able to complete the job within a few days.¹⁹

¹⁹We again stress, however, that we cannot and will not substitute our view of the facts for that of the district court. We hold only that the district court's finding of fact is not

In a similar vein, "Mr. Smith of CMI testified that, other things being equal, he did not wish to pay 10, 20 or 30 times more than necessary to obtain installation service." Id. at 291. For the reasons stated above, this does not show that CMI, under certain special circumstances such as the need for fast turnaround, would be unwilling to pay a considerable premium, even if under normal conditions it would pay only the IBM rate. This finding too cannot stand as presently supported.

2. Alleged Lack of Demand for Third-Party Installation

The district court additionally supported its finding of lack of demand for AMI-installed upgrades by referring to evidence that, in the few occasions in which IBM had made SWRPQ pricing available for MIPS upgrades, there were few such upgrades sold without IBM labor. The court reasoned as follows:

There is insufficient evidence of demand for upgrade labor at prices AMI would have to charge to support a conclusion that a competitive market for 308X upgrade labor does or could exist. Leasing companies have purchased virtually no 308X model, memory, or channel upgrades without IBM labor included (in order, for instance, to have AMI install the upgrade) when such upgrades were available on an SWRPQ basis (which roughly equals the price IBM would be entitled to charge for its parts). Every J to K upgrade purchased by CMI and Comdisco was bought with IBM installation service included even though IBM also sold the feature on an SWRPQ basis.

Id. at 290-91 (footnotes and record citations omitted). In a footnote, the court responded to AMI's argument that the reason

adequately supported by the elaboration contained in its opinion. On remand, the court may of course re-examine this issue and again reach the same conclusion, if it is supported by sufficient evidence and findings of fact.

there were so few SWRPQ orders was that the unbundled prices were not well-publicized:

Witnesses from CMI and Comdisco testified that neither company knew that IBM sold upgrades (including the J to K) without IBM labor included. I do not credit such testimony, as there was documentary evidence (requests for IBM "SW" prices) to the contrary. Further, the SWRPQ procedure has existed since 1975. SWRPQ prices are readily available from IBM. AMI acknowledged that SWRPQ prices are made available from IBM when specifically requested.

Id. at 291 n.74. (record cites omitted) AMI argues that this determination was based on insupportable impeachments of witnesses and was clearly erroneous.

Mr. Lewis, Vice-President of Comdisco, the largest leasing company, admitted that, as of the trial date, he knew that IBM installation was not mandatory. He was then cross-examined on the issue of one particular 308X MIPS upgrade, the J to K model conversion. He then stated that he acquired nine such upgrades in the past, all with IBM labor included. But when asked whether he knew that IBM installation was optional at the time he purchased the J to K upgrades, he said he did not. Quite simply,

Lewis' admission does not impeach his testimony that he was unaware of SWRPQ pricing during the relevant time period.

The district court then used certain documentary evidence to impeach Lewis. DX 2260 is a request from Lewis for SWRPQ pricing on three upgrades, J16-J24, K16-K24 and G16-G24. None of these are the J-K upgrade that Lewis testified about at trial.

Moreover, their designations are consistent with memory upgrades,

not MIPS upgrades.²⁰ DX 2266 is more explicit, specifically stating that memory upgrades are involved. 308X memory was usually neither TCM-based nor subject to net pricing and is thus not at issue. Accordingly, the conclusion to be drawn from this evidence is that Lewis was unaware that MIPS upgrades were SWRPQ-priced, although he had purchased some unrelated memory upgrades without IBM installation in the past. Lewis' testimony that he was unaware of SWRPQ pricing for 308X MIPS upgrades was not impeached. Therefore, nothing can be concluded from Comdisco's failure to purchase MIPS upgrades under SWRPQ terms other than it was unaware they were available.

The district court also noted the testimony of Mr. Loria, a CMI Vice-President. He testified that, to his knowledge, IBM would not sell upgrades without a labor charge. Much of this testimony centered on the year 1976, years before IBM introduced the 308X series of computers. He also stated that he thought that SWRPQ terms meant simply that IBM did not retain the old parts. Except for the J-K upgrade, the only SWRPQ upgrades he testified about were not MIPS upgrades.

The district court believed that this testimony was impeached by three exhibits, DX 2261, DX 2262 and DX 2263. DX 2261, however, is just a 1986 request for SWRPQ pricing on a 96

²⁰308X model numbers appear to be classified as follows: 308X-YMM; where X is the CPU family, e.g., 3081, 3083, 3084; Y is the CPU power indicator within the family, e.g., 3081-J, 3081-K; and MM is the main memory in megabytes, e.g., 3081-J16, 3081-J24. This is consistent with the numbering scheme for memory upgrades in DX 2266.

to 128 megabyte memory upgrade; Loria never testified that non-net priced memory upgrades did not exist. DX 2262 and DX 2263 are IBM's responses to CMI requests for SWRPQ-priced memory upgrades. None of these documents tend to show that Loria knew that a few MIPS upgrades were available without IBM installation; accordingly, his testimony to the contrary was not impeached by this evidence.

Another Vice-President of CMI, a Mr. Smith, testified similarly to Loria, stating that he was not aware that the J to K MIPS upgrade was available without IBM installation. The district court found that DX 2265 impeached Smith's testimony. That document is a computer printout of requests for price quotations ("RPQs") with the name "Gary Smith" handwritten at the top. Some of these RPQs were for SWRPQ terms, but none were for MIPS upgrades. Once again, this evidence does not impeach Smith's testimony.

In short, that to which the district court refers does not bear out its conclusion that these witnesses were untruthful when they claimed not to know of a few MIPS upgrades without IBM installation.²¹ Thus, the fact that a few MIPS upgrades were

²¹In addition, the district court relied on the fact that the SWRPQ procedure has existed since 1975, that "SWRPQ prices are readily available from IBM," and that AMI acknowledged this fact. This all appears to be true, in general, but there is no indication in the portions of the record cited by the court below that these facts impeached the testimony of the Comdisco and CMI witnesses that they were unaware of SWRPQ-priced MIPS upgrades for 308X series computers. That these prices were available for memory upgrades and for earlier series of computers could not have reasonably put these witnesses on notice that a very small number of SWRPQ-priced MIPS upgrades were made available for the 308X series, given IBM's well-publicized policy of net pricing.

sold under SWRPQ terms does not prove that there was no separate demand for installation services, particularly considering that IBM had every economic incentive to protect its revenues and avoid widely publicizing the existence of such upgrades.

3. AMI's "Massive Losses" From Inventory Costs

In addition to finding that AMI would attract no customers at the price the court believed it would have to charge for its service, the district court also found that AMI would suffer massive losses at the IBM hourly rate. It based this conclusion on its belief that AMI would have to maintain an inventory of expensive upgrade parts to provide adequate turnaround time. Because IBM's revenues would average only 1.2 percent of the net price for the upgrade and its carrying costs for the parts inventory would average 3 percent, the district court concluded that AMI stood to lose over \$35 million by competing with IBM. Id. at 288. Although the court acknowledged that AMI's principal argument was that leasing companies inventoried their own parts and thus saved AMI the costs of doing so, it nevertheless included these carrying costs when calculating AMI's ability to make a profit, based on a purported admission by AMI.

It is, of course, true that AMI would have to carry an inventory of parts to give its customers fast turnaround on upgrade installations. This is exactly what AMI did for the earlier 303X series of computers. The exception would be if the customer itself maintained an inventory of parts. Thus, to the extent AMI intended to compete for the business of end-users, who typically do not inventory parts, AMI would have to maintain an

inventory, which would be presumably unprofitable given the revenue generated by the installation. Leasing companies, on the other hand, constituted over 90 percent of AMI's business and were known to inventory their own parts. So, while the relatively minuscule end-user business may have been foreclosed from AMI by the low margins generated by TCM-based upgrades, the business from leasing companies was not.

It would be both a non-sequitur and clearly erroneous on its face to find that AMI's argument that leasing companies would inventory their own parts and relieve AMI of that cost is invalid solely because AMI admitted it will incur such costs on its own inventory. The district court, however, relied on its belief that Mr. Allen admitted that AMI would incur inventory costs if it were permitted to compete in the market of 308X net priced upgrades. Id. at 288-89. The record contains the following exchange:

Q. And according to Mr. Hamilton's report on damages, he indicates that you have told him that AMI must maintain a certain worth of inventory of upgrades and parts, and that a fair estimate of AMI's carrying costs for that inventory, just for the carrying costs of the interest involved is approximately three percent of IBM's price, whatever you happen to pay for those parts.

Did you tell Professor Hamilton that, sir?

A. I identified for Professor Hamilton, when he was doing a damage study, he asked me, if you were permitted to compete in this market of net priced MESSs, what would be your costs?

I identified it would be AMI's intent, similar to the volume procurement agreement, to order many parts from IBM.

There was a question whether these parts would come from the parts center on a very rapid response or whether AMI would have to inventory, virtually millions of dollars of inventory.

From going on prior experience with the VPA, where we ordered large quantities for inventory and were not using the parts center, he said, wouldn't you have some type of carrying charges?

Now, that number that he picked of three percent was if the prime rate were 12 percent. . . .

I don't know further the -- all the economic data in regard to what -- Mr. Hamilton went further from that, but the question was asked.

On the next page of the transcript, Allen then stated that as long as upgrade parts could arrive quickly from the IBM Parts Center, there would be no need for AMI to maintain an inventory. This "admission," (Allen stated only that the question was asked), does not admit that AMI would be required to carry an inventory for all of its customers. It was therefore insufficient grounds upon which to conclude that inventory costs must be included in every situation in which AMI does business.²²

²²Earlier in its opinion, the district court found that Allen had admitted that AMI could not make a profit on a labor value of 1.2 percent of the net upgrade price. Allen-Myland, 693 F. Supp. at 284. The trial testimony shows that counsel for IBM asked Allen whether he would take on an upgrade for \$25,500 labor charge when the net price was \$2,090,000, a 1.2% margin. Allen replied that he would, and that he thought it was a viable business opportunity. Counsel then tried to impeach him with a letter he wrote to IBM in the context of settlement negotiations. On the witness stand, Allen admitted the existence of this letter but claimed that counsel was taking it out of context. We do not think this letter can be fairly read to concede that AMI could never make a profit on a 1.2 percent margin. Like the statement

4. Low Margins and Separate Markets

The district court also found that the value of the labor content of 308X MIPS upgrades was de minimis for antitrust purposes. Id. at 283. Later, it referred to another purported admission by AMI's counsel, to the effect that, if the labor content of upgrades was de minimis, then parts and labor would have to be considered a single market. Id. at 289 n.71.

To the extent it might be argued that AMI admitted that a 1.2 percent margin caused parts and installation to fold into one market, as a matter of law we cannot agree. The record indicates that the total value of all 308X MIPS upgrades performed between 1981 and 1985 was over \$2 billion. 1.2 percent of a \$2 billion market amounts to over \$20 million. See Allen-Myland, 693 F. Supp. at 292. This amount is not de minimis within the meaning of the antitrust laws. See Fortner I, 394 U.S. at 501-02, 89 S. Ct. at 1257-58 (\$190,000 not considered de minimis by the Supreme Court).

5. Conclusion

The district court's finding that no separate market existed for installations of upgrades cannot stand. We will accordingly vacate it and remand for further proceedings. On remand, the district should re-examine the issue de novo.

B. Substantial Volume of Commerce

discussed in the above text, it admits no more than that, to the extent AMI must buy and inventory the parts, it cannot earn a profit on that margin.

As part of its "viable business opportunity" inquiry, the district court also found that AMI had not proved that IBM's tying arrangement foreclosed a substantial volume of commerce. Allen-Myland, 693 F. Supp. at 292-93. Although the court acknowledged that the \$20 million market for upgrade installations was quantitatively more than sufficient, it found that AMI had not shown "that it engaged in an activity foreclosed by IBM's net pricing." Id. The district court believed that it was the changes brought about by the 308X's TCM technology, not net pricing, that foreclosed AMI from the upgrade business. Thus, according to the court, competition with IBM in the installation of upgrades had become unprofitable because of advancing technology, quite apart from any anticompetitive effects of the tie.

First of all, to the extent the district court based this conclusion on its findings that AMI lacked a viable business opportunity, it necessarily erred. We have already pointed out the factual and analytical errors behind those conclusions. Although we do not decide those factual issues ourselves, it appears likely from this record on appeal that AMI could have successfully performed upgrades and made a profit in the absence of net pricing; at least, the district court's findings that no one would pay AMI any more than IBM and that AMI would be burdened with across-the-board inventory costs were not supported by the evidence it cited.

Second, and more importantly, there is no requirement that an antitrust plaintiff show profitability in addition to showing

some foreclosure of commerce. If the competition foreclosed by a tying arrangement had to be profitable, then many anticompetitive tying arrangements would be immunized from antitrust attack. For example, a new competitor attempting to break into a dominated market might well lose money for a time, either because of aggressive introductory pricing or because its sales had not yet grown to the point where economies of scale made its production operations sufficiently inexpensive to turn a profit. Yet, the defendant could exploit its market power with impunity on the ground that the plaintiff could not profitably compete against it, and continue using that power to keep all new competitors out of the tied market. Such a result would be contrary to the purpose of the antitrust laws. Accordingly, we hold that the district court erred when it found that a substantial amount of commerce was not foreclosed.

C. Fact of Damage

An antitrust plaintiff must also prove what is known as "fact of damage," defined as harm of a type which the antitrust laws were designed to prevent. See supra typescript at 10. The district court declined to rule on this issue, but noted that its earlier findings that AMI was not deprived of a viable business opportunity seemed to preclude any finding that AMI suffered the requisite damage. Allen-Myland, 693 F. Supp. at 298. We, of course, make no finding, but observe that the district court's

errors on what it termed the business opportunity issue call its tentative conclusion on fact of damage into question as well. The matter remains, however, an issue for that court to resolve in the first instance.

VI. CONCLUSION

We will accordingly vacate the district court's judgment in favor of IBM and remand for further proceedings consistent with this opinion.

