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## MONOPOLIZATION OF COMPUTER PERIPHERAL EQUIPMENT: *Telex Corp. v. International Business Machines Corp.*, 510 F.2d 894 (10th Cir. 1975)

BY CHRISTOPHER NORGAARD\*

### INTRODUCTION

*Telex Corp. v. International Business Machines Corp.*<sup>1</sup> represents the first major decision in a series of antitrust actions which have been lodged in recent years against the International Business Machines Corporation (IBM) by both IBM's competitors and the Justice Department.<sup>2</sup> Prior to reversal by the Tenth Circuit, Telex had obtained one of the largest damage awards in the history of American litigation.<sup>3</sup> The trial court judge, A. Sherman Christensen,<sup>4</sup> found that IBM's success had generally been due to its skill, industry, and foresight, and, specifically, that IBM had set the standard of quality in the industry for products and services.<sup>5</sup> But because IBM was also found to have a high percentage

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<sup>1</sup> 510 F.2d 894 (10th Cir.), *petition for cert. dismissed*, 96 S. Ct. 8 (1975), *rev'g* 367 F. Supp. 258 (N.D. Okla. 1973).

<sup>2</sup> Telex's numerous compatriots who have similarly besieged IBM with suits alleging monopolization of the "peripheral equipment" part of the electronic data processing (EDP) industry have had their actions consolidated for trial in the Northern District of California and assigned to Judge Ray McNichols for pretrial proceedings. Discovery is continuing and trial has tentatively been set for late 1976 and early 1977. The consolidated action is entitled *In re IBM Antitrust Cases*, MDL No. 163 (N.D. Cal., filed April 11, 1975). To date, one case, *Marshall Industries v. IBM*, has been settled and dismissed. See note 8 *infra*. The Justice Department's action, *United States v. IBM Corp.*, No. 69 Civ. 200 (S.D.N.Y., filed Dec. 11, 1974), is now in trial before Judge Edelstein. The Justice Department is seeking to break IBM into smaller units on the basis of alleged monopolization of mainframes as well as peripheral products.

<sup>3</sup> The district court awarded plaintiff Telex \$259.5 million in treble damages and \$1.2 million in legal fees. 367 F. Supp. at 363-64.

<sup>4</sup> Judge Christensen, Senior Judge for the District Court of Utah, was assigned specially to the *Telex* case. For the procedural background, see *Id.* at 267-69.

<sup>5</sup> *Id.* at 306.

of the relevant market as defined by the district court, IBM's introduction of products at lower prices, in ways which were stated to be lawful absent such a market share, was deemed violative of the antitrust laws to the extent that a competitor (Telex) was injured.<sup>6</sup> The United States Court of Appeals for the Tenth Circuit reversed the antitrust decision. The appellate court, however, believed itself so constrained by the market share test that it went off in search of a new and larger market (of which IBM's percentage share was relatively low), finding one only by introducing a new and logically unwarranted concept of supply substitutability.<sup>7</sup>

The *Telex* case was settled prior to a decision by the United States Supreme Court on whether to grant certiorari.<sup>8</sup> Each side dismissed its claims with prejudice, although certain injunctive provisions of the Tenth Circuit's decree relative to Telex's misappropriation of IBM trade secrets remain in effect. Claims based on activities outside of the United States, which had been excluded from the case by stipulation of the parties, will not be pursued. The settlement makes the Tenth Circuit's decision all the more important; moreover, it is likely that the Supreme Court will at some time render a decision on the facts of *Telex* in either the Justice Department action or the other consolidated cases.<sup>9</sup>

This article suggests that courts should relax the market share test in favor of a more comprehensive industry analysis

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<sup>6</sup> Although the court does not make a general finding on this point, it is supported by the court's specific findings in its separate discussions of each challenged act. *See, e.g., id.* at 294, 296-97, 299, 301, 306, 342, 345, 346, 347.

<sup>7</sup> 510 F.2d at 897, 917. Supply substitutability and reasonable interchangeability are two terms which describe the same concept. The former term is used throughout this article and in the district court's opinion; the Tenth Circuit uses the latter term.

The court of appeals affirmed judgment in favor of IBM on its counterclaim for misappropriation of trade secrets, but reduced the compensatory damages to \$17.5 million while affirming the \$1 million punitive damages award.

<sup>8</sup> Wall Street Journal, Oct. 6, 1975, at 6. Telex stated in documents filed with the SEC that it would be unable to pay the \$18.5 million IBM counterclaim damages awarded by the Tenth Circuit. IBM has also settled a peripheral products action brought by Marshall Industries, which has since sold its electronic data processing operations to Mohawk Data Sciences for a cash payment of \$800,000. Marshall had sought \$36 million in actual damages. The other plaintiffs have generally stated that they intend to press ahead notwithstanding the Telex and Marshall settlements, which they view as motivated by the special financial conditions of the settling plaintiffs. *Id.*, Sept. 30, 1975, at 16. *See also* note 2 *supra*.

<sup>9</sup> *See* note 2 *supra* and accompanying text.

when monopolization is alleged, with the focus on what should be the ultimate issue in any monopolization case: Has the defendant demonstrated the power to control prices or exclude competition? The Supreme Court has pointed the way with its recent treatment of merger cases under section 7 of the Clayton Act.<sup>10</sup> In *United States v. General Dynamics*<sup>11</sup> the Supreme Court rejected the talisman of market share in favor of a detailed examination of industry trends and economics.

Indeed, it may be seriously wondered whether monopoly power resulting from single firm growth is even possible in the absence of governmental intervention or capital curtailment and absent conduct independently violative of the antitrust laws. Moreover, any possible detriment resulting from short-term monopoly position should be outweighed by the benefits of a relaxed monopolization policy in shaking up complacent, oligopolistic major manufacturing industries.

## I. NATURE OF THE COMPUTER INDUSTRY

### A. *Electronic Data Processing Systems*<sup>12</sup>

An EDP system has two general parts: A central processing unit (CPU or mainframe) which controls the system and performs logical operations such as additions, subtractions, and comparisons; and peripheral equipment consisting of input devices, output devices, and storage devices.<sup>13</sup> The CPU and peripheral equipment are controlled by a sequence of instructions which tells the system how to perform a given function. This sequence of instructions is known as "software"; the CPU and peripheral equipment are known as "hardware." Peripheral equipment is a necessary and important equipment group which now accounts for 50 to 75 percent of a new system's price. Peripheral equipment includes a number of different devices performing varied functions.

The first function is storage of information for processing.

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<sup>10</sup> 15 U.S.C. § 18 (1970).

<sup>11</sup> 415 U.S. 486 (1974).

<sup>12</sup> This discussion is based largely on the district court's findings of fact, nos. 24-34. See 367 F. Supp. at 273-75. See also Briefs for Appellant and Appellee.

<sup>13</sup> Peripheral devices, however, can also perform control functions. Moreover, peripherals such as tape and disk drives have their own controllers.

Storage devices include magnetic disk spindles, magnetic tape drives, and memories. Tapes and disks are somewhat analogous to conventional recording tapes and phonograph records respectively. Disk drives are faster and more expensive than tape drives. Memories are even faster and more expensive than disks. In addition to peripheral memories, all CPU's have a minimum memory capacity of their own, and increasingly larger memories are being integrated into CPU's. Data is transmitted to the processor and returned in processed form through memories. Disks and tapes are a more permanent storage media from which data can be transferred to memories for processing.

Two additional peripheral equipment functions are input and output. Input is the conversion of data from language or numbers to electronic signals for processing; output is the conversion of electronic signals back to printed or typed language for display on paper or a television-like screen. Output devices can also be used to perform further mechanical functions, including the operation of other computer systems. Some examples of input-output peripheral equipment are teletype machines, typewriter terminals, card punches, punch card readers, and readers of characters on checks or merchandise. Both tapes and disks can also perform input and output functions.

A peripheral device is said to be "plug compatible" with other components of a system when it can be "plugged" into that system without modification. Peripherals designed for one system can be used in another system only if the manufacturer changes the "interface" attachment between the peripheral device and the other system components. Such interface modifications constitute a very small part of a peripheral device's manufacturing cost.<sup>14</sup>

Computer equipment is classified by generations (first, second, third, or fourth generation) according to the technology used in producing the equipment. A higher numbered generation incorporates significant technological advances, usually resulting in an improved price/performance ratio over the generation preceding it. First generation equipment was initially produced in 1952,

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<sup>14</sup> For example, the total engineering cost required for Telex to modify its first tape drive for use in the IBM System 360 was \$42,000. *See* 367 F. Supp. at 270.

and equipment of the succeeding generations appeared in 1958, 1964, and 1970.<sup>15</sup>

### B. *The Computer Industry*<sup>16</sup>

As of 1972, 96 companies manufactured and marketed all components required for a complete EDP system and were thus considered systems manufacturers. About seven of these are considered principal manufacturers; they include IBM, which was found by the district court to have 35 to 45 percent of the systems market, Sperry Rand Univac, Honeywell, Control Data, Burroughs, National Cash Register, and Digital Equipment Corporation.<sup>17</sup>

In addition, a large number of generally smaller companies manufacture and market only peripheral equipment for use in systems manufactured by others. IBM systems customers are the chief market for peripherals made by others because IBM, as the industry leader, has the largest number of installed systems. The manufacture by others of peripherals plug compatible with IBM systems received its primary boost by the widespread success of IBM's third generation System 360, first marketed in 1964. In 1966 Telex and other manufacturers began marketing peripheral equipment which was "plug compatible" with the System 360.

IBM's plug compatible manufacturer (PCM) competitors market copies of IBM peripherals. The PCM's wait until IBM has brought a system to market and then duplicate the peripheral devices through reverse engineering. IBM's lead time over Telex, *i.e.*, the time required for Telex to study, duplicate, and market its own plug compatible copy, has generally been at least 1½ to

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<sup>15</sup> Brief for Appellant at 17. IBM's fourth generation equipment is the System 370, which includes the Merlin (3330) disk and the Aspen (3420) tape. In 1972, a new field effect transistor memory was introduced with the new Models 158 and 168 of the System 370 CPU. The System 370 components will be referred to as fourth generation products, although, as discussed below, it is not clear that they offer sufficiently improved price/performance characteristics to constitute a new or separate market for purposes of assessing liability for monopolization. See text accompanying notes 100-05 *infra*.

<sup>16</sup> This discussion is based largely on the district court's findings of fact, nos. 17-23. See 367 F. Supp. at 271-73. See also Briefs for Appellant and Appellee.

<sup>17</sup> General Electric, RCA, and, very recently, Xerox have left the industry. Sperry Rand Univac and Honeywell, respectively, have taken over the RCA and General Electric operations. Honeywell has signed a letter of intent to service installed Xerox computers and is negotiating for the purchase of Xerox's manufacturing operations. Wall Street Journal, Dec. 9, 1975, at 7.

2 years, absent illegal appropriation of IBM trade secrets.<sup>18</sup> IBM's total costs are accordingly higher than those of its peripheral competitors, although its manufacturing costs alone appear to be 10 to 15 percent less than those of Telex. Of course, if its manufacturing costs were not less than those of Telex, IBM would presumably have strong incentive not to manufacture its own peripherals but simply to engage Telex as a supplier. Many "Telex" branded peripheral components are manufactured by other suppliers for final assembly and marketing by Telex.<sup>19</sup>

A user can change its installed peripherals either by replacing only the peripherals on a box-for-box basis, or by converting to an entirely different system. While most users can replace on a box-for-box basis with relative ease, the same is not true for converting to a different system. Systems purchasers and lessees are typically large and increasingly sophisticated institutions. They include government agencies, universities, and business corporations. A great deal of customwork must go into the design and installation of each system for its particular use. Precise configuration and selection of equipment must be made, based upon the customer's needs, space, and financial limitations, and the customer's data must be appropriately programmed and its personnel trained. Because of the reprogramming which is required in addition to reinstallation and retraining, there is a significant conversion-cost barrier encountered by a user seeking to replace its present system with another. Apparently, there are no statistics indicative of the height of this barrier, but some industry personnel have estimated that a systems manufacturer or marketer has perhaps a 20 to 25 percent chance, at best, of surmounting the barrier to obtain customer conversion to a system which otherwise offers price/performance advantages over the customer's existing system.<sup>20</sup>

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<sup>18</sup> Such misappropriation was found to have occurred in connection with the Telex copies of IBM's fourth generation tapes and disk drives. A table in the district court decision shows a comparison of the IBM product introduction dates with those of equivalent Telex introductions. 367 F. Supp. at 292.

<sup>19</sup> Telex disk drives are purchased from Information Storage Systems, a Sperry Rand subsidiary. The basic mechanism for Telex printers is purchased from Control Data. The basic parts of the Telex memories have been purchased from various suppliers.

<sup>20</sup> Various computer industry personnel were contacted with regard to background information important to an understanding of antitrust principles in the EDP industry but not discussed in the briefs or court opinions.

Price/performance considerations of the product itself, however, are dominant when a customer considers a PCM offer to replace one or more peripherals with PCM products. Moreover, it appears to be fairly common for such price/performance considerations to induce a new system customer to substitute PCM equipment directly at the time of the system purchase. Telex itself has purchased IBM CPU's and offered them to new customers in conjunction with Telex peripherals.

## II. FACTUAL BACKGROUND TO CONTROVERSY

### A. *IBM's Responses to Its Declining Peripheral Product Market Share During the 1969-1972 Period*

The years 1969 and 1970 saw substantial erosion of IBM's market share of System 360 compatible disk drives in favor of Telex and other PCM's who were marketing such products at prices substantially below those of IBM. The IBM 2314 series disk drive and controller was the disk component of the System 360.<sup>21</sup> Telex shipments of its 5314 disk drive and controller, equivalent to the IBM 2314 series, began in April 1970, and by December 1970 the PCM's had replaced at least 5.3 percent of the 2314-type disk drives attached to IBM systems.

IBM's first response to the market erosion problem studied by a task force created in February 1970<sup>22</sup> was the 2319A disk drive for Model 145 of IBM's new System 370.<sup>23</sup> The 2319A announcement was made on September 23, 1970, and its stated purpose was to provide a smaller and cheaper disk drive alternative for the 370/145 CPU than the fourth generation Merlin 3330 disk drive. To produce the 2319A, IBM began with a 2314 series four-spindle disk drive and removed one of the spindles, reducing storage capacity by one-fourth. The control function, which had been performed by an independent controller on the 2314 series

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<sup>21</sup> The 2314 disk drive was available in three basic configurations: The 2312, containing one disk-drive spindle; the 2318, containing two spindles; and the 2313, containing four spindles.

<sup>22</sup> IBM designated peripherals as a "Key Corporate Strategic Issue" in February 1970. One month later a task force was formed, headed by H. E. Cooley, Vice President of IBM's Systems Development Division. On July 31, 1970, the Cooley task force reported to IBM's management review committee. 367 F. Supp. at 293.

<sup>23</sup> For a discussion of IBM's marketing of the 2319A disk drive, see the district court's findings of fact, 367 F. Supp. at 293-94, and the court of appeals' opinion, 510 F.2d at 900-02.



models, was split into two parts, with one part placed inside the 2319A box itself and the other moved into the 370/145 CPU. The 2319A was priced substantially below both the 2314 series unit, which was still available for use with the 370/145, and the PCM equivalents. Its monthly rental was \$1,550, compared with a total monthly rental of \$2,875 for the comparable 2314 series unit.<sup>24</sup> Its rental was also a minimum of \$300 below Telex's monthly rental for its equivalent product. The 2319A's price was not below production costs and was projected to produce a profit margin in excess of 20 percent on expected sales volume.

A second peripheral task force was formed by IBM in October 1970.<sup>25</sup> The new task force analyzed IBM's PCM competitors in some depth, including their manufacturing costs and cash flow relating to 2314 series products. Its report concluded that Telex was a viable competitor in a number of respects, but that its manufacturing costs were 10 to 15 percent above those of IBM. The report, after finding that Telex and Memorex were IBM's two chief PCM competitors, undertook to forecast the effect on them of various 2314 price cuts. IBM believed that Memorex and Telex would respond to 2314 price cuts with reductions of their own, but that such reductions would have a very serious impact on their profits and revenues.

IBM announced the 2319B disk drive on December 14, 1970. It could be used with all System 360 CPU's. The 2319B had the same storage capacity as the 2319A, but, unlike the 2319A, control logic was not moved to the CPU. The monthly rental price for the new unit was more than \$1,000 below that of its 2314 series equivalent, \$270 below the monthly rental of Telex's 2319B equivalent, and \$235 below the average PCM rental for such a product. In addition, IBM's extra use charges, which Telex did not have and which IBM knew to be a source of customer irritation and expense, were eliminated on the 2319A, 2319B, and fourth generation 3330 disk drives. As the district court noted, the 2319B announcement was "purely a price cut" which did not purport to increase performance over the 2314 series disk subsystems.<sup>26</sup>

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<sup>24</sup> 367 F. Supp. at 293.

<sup>25</sup> *Id.* at 295.

<sup>26</sup> *Id.*

The 2319 pricing actions did not reverse the decline of IBM's market share. The PCM's, including Telex, made responsive price cuts to levels substantially below those of IBM. They had the additional advantage of "complete modularity," *i.e.*, their disks were available in a greater variety of storage capacities so that they were able to "sell between" IBM's 2319 configurations. Also, Telex was able to meet the IBM price reduction, because it negotiated a 28 percent price reduction from its 2314-type supplier, Information Storage Systems. Between November 1970 and December 31, 1972, Telex shipped 1,074 more 2314-type disk drives and 191 more 2314-type disk controllers than it had predicted. By December 1972, the PCM share of 2314/2319-type disk equipment was 21.6 percent, and the PCM share of all disk drives installed on IBM CPU's was 17.5 percent.

#### B. *IBM's Fixed-Term Leasing Plan*

In the first quarter of 1971, Mr. Whitcomb of IBM prepared another study of PCM's which was presented to the president of IBM and to IBM's management review committee.<sup>27</sup> It estimated that by 1976 IBM would lose 19 percent of the plug compatible tape market and 28.7 percent of the disk market, including 48 percent of the fourth generation 3330 disk installations. The study recognized that defending against the PCM's was difficult due to their pricing and performance advantages and recommended frequent improvements in technology, as well as pricing actions, to exploit IBM's new product lead time. It also recommended the consideration of long-term leases. It raised a warning flag of possible substantial erosion in printers and memories; in 1970, IBM had begun to suspect that Telex would soon offer a memory device. A task force, known informally within the IBM organization as the "Blue Ribbon Task Force," was formed to develop a new peripheral strategy. On May 6, 1971, the task force recommended drastic tape and disk price cuts ranging from 15 to 50 percent. Instead of accepting this recommendation, the management review committee, apparently on the wishes of IBM President Frank T. Cary, suggested a long-term leasing approach. The fixed-term leasing plan (FTP) was formulated, and upon approval by the management review committee on May 25, 1971,

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<sup>27</sup> *Id.* at 297-98. See also 510 F.2d at 904.

was announced to the public 2 days later.<sup>28</sup> The task force anticipated that FTP would reduce revenue by more than \$75 million in 1971 and 1972, but believed that it would produce a profit in the long run due to reduced market shares for PCM's and less churning of equipment.

FTP covered disks, tapes, and printers. It provided for a 15 percent reduction in purchase price. For lease customers, it provided an alternative to the current 30-day rental contract with discounts of 8 percent on a 1-year lease and 16 percent on a 2-year lease. Additional use charges were also eliminated for all products covered by the plan. The total effective monthly rental reduction on the 2-year plan was 31 percent on disks and 20 percent on tapes. The reduction on printers was in the 30-35 percent range. The cuts put prices of products covered by the plan "in some instances" below those of the PCM's. Nevertheless, Telex and the other PCM's managed to respond by generally lowering their prices below those of IBM. Telex prices were lower than those of IBM at all times within the 1968-72 period, except on "four isolated occasions," and Telex's prices were generally somewhat higher than those of the other PCM's.<sup>29</sup>

IBM imposed termination penalties of 5 times the monthly rental charge in the event of termination of a 2-year lease during its first year, and 2½ times the monthly rental charge for termination of a 2-year lease during its second year or for termination of a 1-year lease. The plan was completely optional, *i. e.*, customers could still purchase the peripheral equipment outright or lease it under the normal 30-day rental arrangement.<sup>30</sup>

FTP was not motivated only by the failure of the 2319 pricing

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<sup>28</sup> 367 F. Supp. at 298.

<sup>29</sup> *Id.* at 299. The district court found that:

Telex's prices were generally higher than the prices of other plug compatible manufacturers. In addition, Telex and the other plug compatible manufacturers generally reduced below list the prices they actually charged through various forms of price concessions.

*Id.*

<sup>30</sup> *Id.* The Extended Term Plan, announced in March 1972, was a variation of FTP and was found by the district court to have no substantially different economic impact or consequence in this case. In March 1973 IBM announced a term-lease plan which offered a 4-year lease on System 370 virtual storage processors. FTP, Extended Term Plan, and the 4-year term lease were all alternatives to the normal 30-day lease-and-purchase options. *Id.* at 300.

actions to stop the rapid erosion of IBM's disk and tape market shares. Because IBM, unlike its plug compatible competitors, had employed no long-term lease of any kind prior to FTP, it had suffered substantial returns of its equipment during the 1970-71 inflationary/recessionary period. This ill fortune had not been shared by the PCM's or by IBM's systems competitors, who generally leased their equipment for 1, 2, or more years.<sup>31</sup> In 1970 IBM's sales force had achieved only 50 percent of its objective, and in 1971 IBM experienced the "worst sales record year"<sup>32</sup> in its history, as gross income growth was sluggish and earnings flattened out.<sup>33</sup>

The effect of FTP was found to be a successful suppression of further PCM growth in the disk, tape, and printer markets. The basis of this finding was that between June 1971 and December 1972 the PCM share of the disk market did not exceed 17.5 percent, and the PCM share of the tape market did not exceed 15 percent. This is not to say, however, that the PCM tape and disk drive market shares did not increase somewhat after June 1971. The PCM share of all plug compatible disk drives increased from 14.5 percent in June 1971 to 17.5 percent in December 1972. The PCM 2314/2319 disk drive share increased from 14.7 percent in June 1971 to 21.6 percent in December 1972. The PCM share of the total tape market during the same period increased only from 13.7 percent to 14.9 percent. This retarded growth rate was apparently due chiefly to IBM's success with its fourth generation Aspen 3420 tape drive, which was announced in November 1970 and first shipped in September 1971. The PCM share of third generation tapes increased during the same period from 13.7 percent to 21.6 percent.

Nevertheless, the fixed-term plan was in many respects a success for IBM. By July 22, 1971, 40 percent of those who were already IBM disk, tape, and printer customers had signed up with FTP. IBM records showed that 90 percent of its new fourth generation 3330 disk and 3420 tape products were being installed under FTP. Immediately following FTP, and notwithstanding

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<sup>31</sup> *Id.* at 297.

<sup>32</sup> *Id.*

<sup>33</sup> Annual Report for the Year Ended December 31, 1974, International Business Machines Corp., Jan. 28, 1975, at 28-29.

competitive price reductions by Telex and three other PCM's, IBM estimated that the order rate of the PCM's had been cut by 50 percent. By the end of 1971, 6 months after the introduction of FTP, IBM estimated a 62 percent decrease in monthly PCM sales of tape products. The same analysis estimated that in the 4½ months subsequent to the FTP announcement, PCM monthly disk sales were off 48 percent from their rate during the first 5 months of 1971.

The district court emphasized an IBM document which had attempted to forecast FTP effects on PCM's. This document had predicted that the PCM's would offer long-term leases similar to those of IBM but with base rentals initially 10 percent below those of IBM and declining 5 percent per year. The forecast noted, however, that in the disk area the initial PCM installations would be conversions from the third generation 2314 series rather than replacements of fourth generation 3330's, because the 3330 was a new product not yet copied by the PCM's and was being widely installed under FTP. IBM estimated that by the time the 3330 leases approached maturity, it would be able to introduce more new products to hold its market share. IBM also predicted that FTP would further encourage customers to move from the 2314 series to the 3330 series disk products.

### C. *IBM's Pricing of CPU's and Memories*

IBM documents indicated that some IBM executives had believed that once FTP was announced it would have to be applied across the board and could not be confined to peripherals.<sup>34</sup> In late June 1971, however, IBM rejected any extension of FTP to CPU's and memories on the grounds that such an extension would "prematurely erode the FTP concept to the entire product line, and, in addition, would be ineffective unless accompanied by some degree of pricing action."<sup>35</sup> In July 1971 CPU prices were raised, with the increase ranging from 4 to 8 percent.<sup>36</sup> IBM's position was that the increase simply reflected higher costs during the 1970-71 period, as shown by Federal Price Commission ap-

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<sup>34</sup> See 367 F. Supp. at 300.

<sup>35</sup> *Id.*

<sup>36</sup> On March 30, 1971, the Data Processing Group had recommended to IBM's management review committee that CPU prices be raised. *Id.*

proval of the increase. On August 5, 1971, Mr. Powell of IBM wrote that the net effect of FTP in conjunction with the July 1971 CPU and memory price increase would "probably be a wash insofar as business volumes are concerned . . . . The net effect of the FTP and price changes will not significantly increase [the customers'] total cost and no system decreases were forecast."<sup>37</sup>

On August 2, 1972, IBM announced its new 370/158 and 370/168 CPU's. The 158 CPU monthly rental was \$30,700, compared to \$20,600 for a 370/155 CPU. The monthly rental for the 168 CPU was \$48,600, as opposed to \$36,400 for a 370/165 CPU. The 158 and 168 offered improved performance, but the district court found that the price increase outweighed the performance increase. At the same time, IBM also announced a new auxiliary memory to be used with the 158 and 168, at a price of \$5,200 per megabyte per month,<sup>38</sup> which was substantially below IBM's prior memory prices. On the basis of IBM's studies and memoranda, the trial court concluded that: (1) The 1971 price hikes on CPU's and memories had been specifically planned to offset revenue reductions resulting from the 2319 and FTP programs; and (2) the 1972 CPU prices on the 158 and 168 CPU's had been planned in conjunction with low prices on the memories to be used with the CPU's to bar entry of memory competitors.

The memory utilized with the older 370/155 and 370/165 CPU's, announced in June 1970, was a magnetic core memory, which because of its relatively large size, was contained in boxes independent of the CPU. Telex had announced its competing memory, the 6360, in November 1971, and had begun customer shipments in November 1972. Although the record apparently did not contain market share information for memories in the same detail as for disks and tapes, the charts and testimony of IBM's Mr. Bonham showed, and the district court found, that in 1970 IBM had received 99.6 percent of all revenues from memory products attached to IBM CPU's. It should be noted, however, that the 1970 measurement was prior to Telex's entry into the plug compatible memory market. It appears that there was virtually no PCM competition for memories plug compatible

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<sup>37</sup> *Id.*

<sup>38</sup> A "byte" is one character of data, often shorter than a word and made up of several "bits." A "megabyte" is one million characters of data.

with IBM's third generation System 360, and none whatsoever by Telex.

In 1970 IBM internal documents had forecast that by 1976 PCM's might sell up to 23 percent of the memories installed with IBM's fourth generation System 370. IBM's forecast had also indicated that PCM's could become viable competitors by offering memories at \$6,000 per megabyte per month if that price were under IBM's price. Meanwhile, work was progressing on replacement of the magnetic core technology, on which IBM's forecast had been based, with field effect transistor, semi-conductor circuitry. The new technology allowed production of much smaller memories at much lower cost. Indeed, IBM has stated that the new memory was 40 times smaller than the old magnetic core and cost less than one-half as much to make.<sup>39</sup> The new memory price of \$5,200 per megabyte per month compared with a \$12,000 monthly rental for the core memory. Nevertheless, Telex announced a competing memory for the 158 and 168 models in March 1973, and Control Data, Itel, Ampex, and Intel also announced competing memories at prices substantially below those of IBM.<sup>40</sup>

#### D. *The District Court's Market Share Statistics*

Market share figures with regard to peripherals are "not readily available from published sources, nor can they be extrapolated or inferred from census data dealing with peripheral products in general . . . ." The court accordingly relied on the testimony and charts of Mr. Bonham of IBM, as well as other charts based on IBM internal documents. The disk and tape percentage market shares shown on the charts are summarized in Table 1.

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<sup>39</sup> 510 F.2d at 907.

<sup>40</sup> 367 F. Supp. at 304. IBM had considered raising the "minimum" memory contained within its System 370/145, 155, 165, and 195 CPU's to reduce the additional memory capacity required and thus shield more memory capacity from PCM competition. Apparently these proposals were not carried into effect. *Id.* at 304-05. The district court found no evidence that IBM had reduced its prices below cost and found further that all of the acts challenged by Telex had been calculated to produce profit margins of at least 20 percent on the volume expected to be sold. *Id.* at 306. The court also found that IBM was the quality leader for products and services in the EDP industry and that its success was due "in substantial measure to its skill, industry and foresight." *Id.*

<sup>41</sup> *Id.* at 286.

TABLE 1  
MARKET SHARE STATISTICS<sup>42</sup>

## TAPE DRIVES

*Third Generation*

	12/70	6/71	12/71	6/72	12/72
IBM: IBM owned	65.8	62.2	59.0	47.9	32.4
IBM: User owned	10.3	10.6	12.0	16.6	24.1
IBM: Leasing company owned	13.7	13.5	13.9	17.5	21.9
PCM	10.2	13.7	15.1	18.0	21.6

*Fourth Generation*

	12/70	6/71	12/71	6/72	12/72
IBM: IBM owned	0.0	0.0	95.7	92.6	87.4
IBM: User owned	0.0	100.0	4.0	2.3	3.7
IBM: Leasing company owned	0.0	0.0	0.0	0.1	0.2
PCM	0.0	0.0	0.3	5.0	8.7

(PCM shipments did not begin until November 1971).

*Combined Third and Fourth Generation*

	12/70	6/71	12/71	6/72	12/72
"IBM"	89.8	86.3	86.0	86.1	85.1
PCM	10.2	13.7	14.0	13.9	14.9

## DISK SPINDLES

*Third Generation*

	12/70	6/71	12/71	6/72	12/72
IBM: IBM owned	62.0	54.8	53.1	49.0	45.0
IBM: User owned	14.8	15.1	15.5	16.8	19.1
IBM: Leasing company owned	16.4	15.6	15.1	15.2	15.3
PCM	6.8	14.5	16.3	19.0	20.6

<sup>42</sup> This table is from the district court opinion. *Id.* at 288-90. The percentages given for combined third and fourth generation tapes and disks were calculated from the court's figures. The Bonham charts apparently contained information on peripheral product revenues which generally did not go beyond 1970. The other charts were those primarily relied on by the district court and measured market shares for disks and tapes, but not other products, at five 6-month intervals: December 1970, June 1971, December 1971, June 1972, and December 1972. The court classified as "IBM" tapes and disks not only those still owned by IBM and leased to users, but also those owned by users and leasing companies. The court stated that the "PCM" tapes and disks also included both sold and leased PCM products, but the PCM statistics, unlike those relating to IBM products, do not indicate how many PCM products were sold and how many were leased. IBM, however, argued that sold PCM products had not been included. Brief for Appellant at 29.



*Fourth Generation*

	12/70	6/71	12/71	6/72	12/72
IBM: IBM owned	0.0	0.0	86.1	90.6	90.5
IBM: User owned	0.0	100.0	13.4	8.6	7.6
IBM: Leasing company owned	0.0	0.0	0.5	0.8	1.2
PCM	0.0	0.0	0.0	0.0	0.7

(PCM shipments did not begin until October 1972).

*Combined Third and Fourth Generation*

	12/70	6/71	12/71	6/72	12/72
"IBM"	93.2	85.5	84.2	82.7	82.5
PCM	6.8	14.5	15.8	17.3	17.5

## III. THE DISTRICT COURT DECISION

The district court rejected IBM's contention that the relevant market consists of the entire EDP industry or, in the alternative, peripheral products compatible with all systems. It held, instead, that the relevant market consists of peripherals plug compatible with IBM systems and that submarkets exist for plug compatible tapes, disks, memories, and printers, together with their respective controllers and communication controllers.<sup>43</sup> The court did not analyze the submarkets in further detail because IBM's share of each submarket was held sufficient to raise an inference of monopoly power and because IBM's predatory acts, as well as documents evidencing general predatory intent, applied to all of the submarkets except communication controllers. The court awarded damages to Telex of \$259.5 million after trebling, plus \$1.2 million in attorney's fees and costs.<sup>44</sup>

The trial court recognized the general rule that monopolization in violation of section 2 of the Sherman Act<sup>45</sup> involves two elements:

- (1) The possession of monopoly power in the relevant market or submarket and (2) the willful acquisition or maintenance of that power with intent to monopolize, which intent need not be evidenced by predatory practices but which is not to be gathered merely from growth or development as a consequence of a superior product, business acumen or historic accident.<sup>46</sup>

<sup>43</sup> 367 F. Supp. at 282.

<sup>44</sup> See note 3 *supra*.

<sup>45</sup> 15 U.S.C. § 2 (1970).

<sup>46</sup> 367 F. Supp. at 335.

The court also defined monopoly power, in accordance with leading Supreme Court cases, as "the power to control prices or to unreasonably restrict competition."<sup>47</sup> The relevant market within which such power must be found is both a geographic market and a product market. In *Telex* the geographic market was the United States, with international aspects having been excluded by stipulation of the parties. The test for whether two products compete in the same product market is whether they are "reasonably interchangeable by consumers for the same purposes."<sup>48</sup> The prime determinant of "reasonable interchangeability" has in turn been cross-elasticity of demand: If a slight rise in the price of one product will cause a substantial number of users to buy another product, the two products can be said to be competing in the same market.

The district court and, apparently, the parties themselves, however, did not make any statistical analysis of cross-elasticity of demand in the computer industry. Indeed, the court only fleetingly mentioned the concept.<sup>49</sup> The court was instead impressed by IBM actions which, on the basis of the documents explaining or appearing to explain them, were aimed primarily at the PCM's following their rather spectacular initial success in installing equipment on IBM systems. The court also stated that the only physical or functional competition for peripheral equipment on a "box-for-box" basis, without changing CPU's, was between IBM and the PCM's, and that:

IBM's Systems competitors were not directly affected by IBM's pricing and product actions for peripherals and made no competitive price responses to IBM's 2319A and B and Fixed Term Plan (FTP) price reductions for its peripheral products. After FTP, IBM's Systems competitors were not mentioned in any of IBM's FTP tracking documents as having cut or reduced their price for any of their products. Time sharing companies, service bureaus, and data centers, were not directly affected by IBM's price and product actions for peripherals, and after 2319A and B and FTP made little if any competitive pricing responses to IBM's peripheral price reductions.<sup>50</sup>

Not completely unwilling to recognize the effect of other sys-

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<sup>47</sup> *Id.* at 336.

<sup>48</sup> *United States v. E.I. du Pont de Nemours*, 351 U.S. 377, 395 (1956).

<sup>49</sup> *See, e.g.*, 367 F. Supp. at 282.

<sup>50</sup> *Id.* at 281.

tems manufacturers on IBM's peripheral product actions, the court found that:

It cannot be gainsaid that indirectly at least and to some degree the peripheral products attached to non-IBM systems necessarily compete with and constrain IBM's power with respect to peripherals attached to IBM systems. The quality and price/performance of the peripherals attached to a system are a substantial factor in a customer's choice between competing systems, and if for example IBM failed to improve the price/performance of its peripherals, customers might choose systems (including peripherals) of other systems manufacturers. For example, the IBM Merlin (3330) disk drive was believed by IBM to be a critical factor to the competitive price/performance of the 370 systems 135, 145, 155, 158, 165 and 168. The 3330 was therefore announced in June of 1970 at a price/performance designed to make IBM more competitive with both systems manufacturers and peripheral equipment manufacturers. . . . Peripheral pricing and product announcements of one systems supplier influence subsequent peripheral pricing and product announcements of other systems suppliers, although it may be difficult to identify any given competitive price cut or product improvement as a reaction to a single competitive act.<sup>51</sup>

The court engaged in something more of a cross-elasticity analysis with regard to its submarket definitions. While noting a degree of possible cross-elasticity among, for example, various kinds of storage devices, the court stated that:

The reality of this situation appears to be that despite some theoretical interchangeability, a rise in the price of one storage device will cause a substantial number of customers to turn to similar devices less expensive rather than to use fewer of such devices and more of other types of devices.<sup>52</sup>

The court believed that the particular applications and objectives of each customer's system imposed sufficiently stringent requirements to justify the court's submarket definitions.

The court adopted the view of *United States v. Grinnell Corp.*<sup>53</sup> that there is "no reason to differentiate" between a "line" of commerce under section 7 of the Clayton Act<sup>54</sup> and a "part" of commerce under section 2 of the Sherman Act.<sup>55</sup> It rejected, how-

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<sup>51</sup> *Id.* at 277-78.

<sup>52</sup> *Id.* at 283.

<sup>53</sup> 384 U.S. 563 (1966).

<sup>54</sup> 15 U.S.C. § 18 (1970).

<sup>55</sup> 367 F. Supp. at 366.

ever, IBM's heavy reliance on the theory of "supply substitutability." IBM argued that the relative ease with which systems manufacturers, or peripheral equipment manufacturers marketing peripherals for non-IBM systems, could change interfaces on their existing products so as to enable them to be marketed for use with IBM systems, was sufficient to place such manufacturers in the same relevant market as IBM and those marketing peripheral equipment for use with IBM systems. The court noted that the cases cited by IBM for this proposition had arisen in a merger context under section 7 of the Clayton Act and involved the potential competition doctrine, by which a merger between a competitor within the market and a potential competitor on the edge of it may be held to be illegal.<sup>56</sup>

On the basis of the market share data summarized above,<sup>57</sup> the district court concluded that IBM's extremely high share of the relevant market and submarkets compelled a finding of monopoly power. After examining each of IBM's acts, the court concluded that all of them involved price reductions which were "predatory" because they were taken by one having predominant market shares without justification in the form of lower costs and with a view toward "suppression" of the PCM's and the inroads they had made. Specifically, the court found that the 2319A disk drive offered no significant performance increase over the 2314 series equivalent and carried a price reduction which was not justified on the basis of reduced manufacturing costs, despite IBM's contention that the lower price could be explained by reuse of 2314 units which had been returned by customers who had switched to PCM products.<sup>58</sup> The court held that the price cut had been camouflaged in the form of a new product so that IBM could avoid reducing rental prices on all of its installed 2314 series subsystems, which reduction would have cut approximately \$120 million from IBM's annual revenue stream of \$514 million on its installed disk drives.<sup>59</sup> A similar view was taken of the 2319B disk

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<sup>56</sup> *Id.*

<sup>57</sup> See table accompanying note 42 *supra*.

<sup>58</sup> See 367 F. Supp. at 294.

<sup>59</sup> The camouflage characterization of the 2319A is somewhat difficult to accept. The large sophisticated customers in the computer industry would presumably have had no trouble seeing through the camouflage. Those who were 370/145 users would, therefore, have switched to the 2319A (IBM had no long-term, discounted leases in effect at this

drive. The court concluded that the price cuts had been designed by IBM to contain its plug compatible competitors and maintain dominant control of the disk submarket. The district court found that, although IBM studies had indicated that FTP would lower IBM's costs through a decrease in the churning of leased equipment, the primary intent and effect of the plan was "suppression" of the PCM's and maintenance of monopoly power.<sup>60</sup>

The court found that the 1971 CPU price increase had been designed to offset reductions in revenue resulting from FTP and that the 1972 pricing of the new 370/158 and 168 CPU's had had a similar purpose of offsetting low memory prices. Although the new CPU's possessed performance improvements and required additional costs in their design and manufacture, these costs and improvements were found to have been more than compensated for by the new price. The court found that, in conjunction with the 1972 CPU pricing, the price of the field effect transistor memory used with the 158 and 168 had been deliberately set at a level below that which IBM knew PCM's would have to charge in order to enter the market and thus constituted an illegal entry barrier.<sup>61</sup>

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time) or would have bargained for reductions on the 2314 series, with the option of moving to PCM products when responsive PCM price cuts had been made. IBM may have protected its revenue by confining the 2319A disk announcement to the 370/145 CPU, but in so doing it was refraining from tactics deemed predatory by the district court. In any event, IBM extended 2319 availability to all third generation systems 3 months later and then made substantial price reductions on all or almost all disk products 8 months later through its FTP.

<sup>60</sup> 367 F. Supp. at 297.

<sup>61</sup> The district court rejected Telex's arguments that the placing of a minimum memory within the 370/158 and 168 CPU's was an illegal tie-in under section 3 of the Clayton Act, 15 U.S.C. § 14 (1970). Although IBM had considered raising the size of the minimum memory in all 370 CPU's for apparently anti-competitive reasons, the court held that the field effect transistor memory integration as finally accomplished carried such overwhelming price/performance advantages as to raise a substantial question of the validity of the Telex contention. These advantages included the elimination of the need for a separate memory cooling system, power supply, and other equipment, all of which are required when memory is not integrated with the CPU. The court also noted that CPU's had been historically designed to include a minimum main memory and that such memory had never been separately priced. The court further pointed out that PCM's were still free to attach their memories to the 158 and 168 CPU's and that Telex and four other IBM competitors had in fact announced intentions to do so.

The court similarly rejected the argument that the placing of integrated controllers within System 370 CPU's created illegal ties. The integrated controller, unlike the previous independent controller, was able to use a part of the CPU's resources to perform its functions and thus carried valid performance advantages. Indeed, the new controller was

The court further concluded that IBM had attempted to monopolize the relevant market and submarkets. The trial court thought that the "great weight" of authority required that a relevant market be established in attempted monopolization cases and that the defendant's actions be shown to present a "dangerous probability" of achieving monopoly power therein.<sup>62</sup> This probability, like monopoly power in monopolization cases, can be inferred from market share measurements. Attempted monopolization also requires a finding of specific intent to exclude competitors. The district court believed that such intent was supplied by the IBM documents which: (1) Demonstrated concern over PCM advances, and (2) evidenced plans to defend IBM's peripheral revenues by pricing actions not justified on the basis of lower costs and undertaken only after specific study of their probable impact on IBM competitors.<sup>63</sup>

#### IV. THE TENTH CIRCUIT DECISION

The United States Court of Appeals for the Tenth Circuit reversed the district court on the monopolization issues.<sup>64</sup> Because of the district court's definition of the relevant market, a factual determination which the Tenth Circuit regarded as clearly erroneous, the court then did not have to decide the issue of attempted monopolization. It also held that the lower court had incorrectly applied the law to IBM's actions which had been challenged as acts of monopolization, because those actions, being routine business tactics within the competitive context of the industry, would not have constituted the "use" of monopoly power even if IBM had possessed such power.<sup>65</sup>

The court stated that two important factors had been overlooked by the district court in its market definition.<sup>66</sup> The first

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not strictly a tie-in at all because the customer was still given the option of using the independent controller, although at a higher price. The court also noted that the challenged integrations had not been "shown to have been dictated by specific predatory objectives on the part of IBM." 367 F. Supp. at 303.

<sup>62</sup> See the dictum in *Walker Process Equip., Inc. v. Food Mach. & Chem. Corp.*, 382 U.S. 172, 177-78 (1965). See also *American Tobacco Co. v. United States*, 328 U.S. 781, 785 (1946), and the cases cited by the district court, 367 F. Supp. at 343.

<sup>63</sup> 367 F. Supp. at 301-02.

<sup>64</sup> 510 F.2d 894 (10th Cir. 1975).

<sup>65</sup> *Id.* at 926.

<sup>66</sup> *Id.* at 916.

was "supply substitutability," the ability of a manufacturer to change the interfaces on its peripherals at minimal cost and, thereby, make them plug compatible with other computer systems. The second was the competition among computer systems of which peripherals are a significant part. But aside from quoting part of the district court's finding 38 to the effect that, indirectly and "to some degree," peripherals attached to non-IBM systems necessarily compete with peripherals attached to IBM systems, the court did not develop its second point of systems competition, but rather relied solely upon the supply substitutability concept.<sup>67</sup>

The court was impressed by the minimal development and manufacturing outlay required to change the interfaces which allow peripherals to be used with other systems, and pointed to trial testimony by Mr. Grant, senior vice president of Telex, that he had in the past advocated such interface modification and that the engineering expense associated therewith was "minimal."<sup>68</sup> The court also noted that following RCA's decision to withdraw from the computer industry and to turn its business over to Sperry Rand Univac, Telex had begun to market its 6420 tape unit, the Telex equivalent of the IBM fourth generation 3420, for use with the RCA CPU's. The court further recounted a Telex letter that was to be sent to systems manufacturers. This letter had offered to sell plug compatible peripheral equipment to new systems purchasers, with the equipment to be interfaced with their CPU's at no cost to the purchasers. The court did not mention whether such offers were accepted, and it seems that generally they were not. The court believed that the trial court had been overly swayed by Telex's decision to compete for sales and leases of peripheral equipment plug compatible only with IBM CPU's.<sup>69</sup>

As for the acts of IBM, the court stated that the district court had failed to consider whether such acts were "ordinary business

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<sup>67</sup> *Id.* at 916-19.

<sup>68</sup> *Id.* at 916-17. For further discussion of interface adaptation see text accompanying notes 129-30 *supra*. Supply substitutability is discussed in detail at pps 318-20 *supra*.

<sup>69</sup> *Id.* at 917.

practices typical of those used in a competitive market,<sup>70</sup> or whether they constituted the use of monopoly power. The Tenth Circuit thought that IBM had only utilized "ordinary marketing methods available to all in the market" and, thus, had not used, even if it had possessed, monopoly power.<sup>71</sup> The court further pointed to the profit margin of approximately 20 percent expected by IBM on the products covered by its acts and accordingly viewed the record as failing to present a case of "an economic giant" subsidizing unusually low prices with its outside "reserves or other activities."<sup>72</sup> Moreover, IBM's total costs of development and manufacture were above those of the PCM's.

To support its view that liability attaches only for the use of monopoly power, the court examined four leading monopolization cases: *United States v. Griffith*,<sup>73</sup> *United States v. Grinnell Corp.*,<sup>74</sup> *United States v. Swift & Co.*,<sup>75</sup> and *American Tobacco Co. v. United States*.<sup>76</sup> The court pointed out that in *Griffith* the defendants had used monopoly power to gain competitive advantages in areas where they enjoyed no monopoly. In *Grinnell* there had been "no issue" as to the presence of improper conduct used to achieve and maintain monopoly power, once the primary issue of the relevant market had been resolved. *Swift* had abused its size and power. In *American Tobacco* an actual conspiracy had been found. The court stated that such cases required a finding of use of monopoly power and that the exceptions to monopolization liability, for monopoly thrust upon a defendant by natural economies of scale or by superior skill, foresight, or business acumen, must be "fitted in with" the requirement of a use of monopoly power.<sup>77</sup> The court rejected that interpretation of *United States v. Aluminum Co. of America*,<sup>78</sup> which held that "the events

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<sup>70</sup> *Id.* at 925-26.

<sup>71</sup> *Id.* at 926.

<sup>72</sup> *Id.*

<sup>73</sup> 334 U.S. 100 (1948).

<sup>74</sup> 384 U.S. 563 (1966).

<sup>75</sup> 286 U.S. 106 (1932).

<sup>76</sup> 328 U.S. 781 (1946).

<sup>77</sup> 510 F.2d at 927.

<sup>78</sup> 148 F.2d 416 (2d Cir. 1945) [hereinafter cited as *Alcoa*]. The Second Circuit, per Judge Learned Hand, decided the case upon certification of lack of a quorum by the Supreme Court. A number of the Justices had participated in the Justice Department's investigation and preparation of the case.



or acts must be entirely involuntary" for the defendant to be absolved of liability.<sup>79</sup>

The court believed that "[t]here must be some room to move for a defendant who sees his market share acquired by research and technical innovations being eroded by those who market copies of its products."<sup>80</sup> The court thus held that the Sherman Act could not be construed to protect competitors from "ordinary competition." Although IBM's task forces and studies had focused in part on the effects of IBM actions on PCM competitors, the court found that the record demonstrated that such study was "part of the competitive scene in this volatile business inhabited by aggressive, skillful businessmen seeking to market a product cheaper and better than that of their competitors."<sup>81</sup> The court concluded this section of its opinion by stating that this issue was governed by the Supreme Court's opinion in *Times-Picayune Publishing Co. v. United States*.<sup>82</sup> It should be pointed out, however, that the *Times-Picayune* language with regard to a defendant's adoption of acts which have been utilized by its competitors refers only to the specific intent required to sustain a charge of attempted monopolization, and not to the general intent required for a finding of monopolization itself. The Tenth Circuit found it unnecessary to consider separately the issue of attempted monopolization, given its view of the nature of IBM's actions.

## V. ANALYSIS OF *Telex Corp. v. IBM Corp.*

### A. *Relevant Market*

#### 1. Supply Substitutability versus Cross-Elasticity of Demand

Neither the district court nor the Tenth Circuit made the kind of complete analysis of the relevant market which the case demanded. At the district court level, this failure was due in large part to insufficient data from which to determine cross-elasticities of demand. The Tenth Circuit, denying this factual basis for reversal, opted instead for the "supply substitutability"

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<sup>79</sup> 510 F.2d at 927.

<sup>80</sup> *Id.*

<sup>81</sup> *Id.* at 928.

<sup>82</sup> 345 U.S. 594 (1953), cited in 510 F.2d at 928.

concept. This concept could enlarge the relevant market to fit certain measurements which were in the record and which showed IBM's share thereof to fall generally at or below 45 percent.<sup>83</sup>

The supply substitutability concept is contrary to both precedent and proper concepts of market definition. The traditional test for definition of the relevant market in monopolization cases was laid down, as the Tenth Circuit recognized, by the United States Supreme Court in *United States v. E. I. du Pont de Nemours & Co.*<sup>84</sup> The test is whether one product is "reasonably interchangeable" with another. The chief economic and legal determinant of reasonable interchangeability is cross-elasticity of demand. If a modest increase in one product's price will cause buyers to turn to the other product, it can reasonably be assumed that the two products compete in the same market. The essential point is that the test revolves around what choices *buyers* will make among products offered to them, not what choices manufacturers can or, in a court's opinion, should make in the offering of products to buyers. It may be true that electronic data processing manufacturers can, with relatively little additional expense, fabricate interfaces enabling their existing peripheral products to be used with different CPU's, but this phenomena is of absolutely no help to a buyer who must choose from products presently on the market. Thus, as the Tenth Circuit stated by quotation from the *du Pont* case, the correct formulation of the rule must be:

Where there are market alternatives that *buyers* may readily use for their purposes, illegal monopoly does not exist merely because the product said to be monopolized differs from others.<sup>85</sup>

Market definition depends upon "how far buyers will go to substitute one commodity for another."<sup>86</sup>

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<sup>83</sup> The district court found that IBM's share of the value of all 1971 shipments of "electronic computers and peripheral equipment, except parts," was 36.7 percent, according to the United States Bureau of the Census. Its share of the value of 1971 shipments of "Electronic Computers, Digital, General Purpose," was 40.9 percent. Similar shares were found for specific categories of peripheral equipment. But certain IBM internal documents, apparently based on unit sales and leases, put IBM's share of the domestic market for systems and peripherals at 75.9 percent in December 1964 and 73.3 percent in September 1968, with IBM's share of CPU's decreasing during the same period from 68.6 percent to 64.4 percent. 367 F. Supp. at 285-86.

<sup>84</sup> 351 U.S. 377 (1956).

<sup>85</sup> 510 F.2d at 917, quoting from 351 U.S. at 394 (emphasis added).

<sup>86</sup> 510 F.2d at 918, quoting from 351 U.S. at 380.

The other cases relied upon by the Tenth Circuit similarly involved consideration of cross-elasticity of demand and functional interchangeability among existing, not potential, products. In *United States v. Charles Pfizer & Co.*<sup>87</sup> it was held that because other acids could be used by the food and beverage industry for the same purposes as citric acid, the Government could not prevail on its contention that citric acid alone was the relevant market. In *Advance Business Systems & Supply Co. v. SCM Corp.*,<sup>88</sup> an attempted monopolization case, it was held that the relevant market included paper for use in all copiers, not merely those manufactured by SCM, because all buyers of machines employing the direct electrostatic process could turn to both SCM's paper and that of other manufacturers. In *South End Oil Co. v. Texaco, Inc.*<sup>89</sup> it was held that the relevant market consisted of all premium motor oils, not merely those of Texaco, because all such oils are reasonably interchangeable by customers and marketers, and in *United States v. Grinnell Corp.*<sup>90</sup> the Supreme Court defined the relevant market on the basis of what "customers may turn to."<sup>91</sup>

As the district court pointed out, the cases relied upon by IBM to establish the supply substitutability doctrine were merger cases decided under section 7 of the Clayton Act. These cases involved the potential competition doctrine, where the existence of competitors poised at the edge of the market ready for entry is important in determining the legality of a merger between such a potential competitor and one already in the market. The doctrine thus goes beyond the effects of a merger between two existing competitors into a somewhat more speculative inquiry. It does not, however, purport to include the potential competitor within the relevant market.<sup>92</sup>

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<sup>87</sup> 246 F. Supp. 464 (E.D.N.Y. 1965).

<sup>88</sup> 287 F. Supp. 143 (D. Md. 1968), *modified*, 415 F.2d 55 (4th Cir. 1969), *cert. denied*, 397 U.S. 920 (1970).

<sup>89</sup> 237 F. Supp. 650 (N.D. Ill. 1965).

<sup>90</sup> 384 U.S. 563 (1966).

<sup>91</sup> *Id.* at 571. It should be noted that the Tenth Circuit's characterization of the *Grinnell* market as "broadly defined" is open to substantial question.

<sup>92</sup> There are, of course, a number of reasons that supply substitutability may never manifest itself in the form of additional products to the consumer. Limited marketing or manufacturing resources may, for a significant period of time, confine a firm to its existing consumer markets, assuming that they remain as profitable as other markets. A firm may

## 2. One General Peripheral Market versus Submarkets

The *Telex* trial court found that submarkets existed for each type of peripheral equipment. These submarkets are the starting point for a correct definition of relevant markets in the peripheral equipment part of the computer industry. Judge Christensen took note of the functional equivalence among, for instance, storage devices (tapes, disks, and, to some extent, memories) but held that sufficient differences existed in performance and user application requirements to justify separate treatment of each peripheral product. No statistics indicative of demand cross-elasticities were presented, however, and the submarkets were not further analyzed because of the similarly dominant IBM share of each.<sup>93</sup> The Tenth Circuit did not consider the issue.

If the district court is correct that each kind of peripheral device has sufficient inelasticity of demand with functionally similar products so as to constitute a separate submarket, it can be argued that the submarkets are the only relevant markets. An increase in the price of IBM tape drives, for example, will not cause significant numbers of users to turn to anyone's disk drives, whether manufactured by a plug compatible manufacturer, a systems competitor, or IBM itself. Each of the relevant markets would include a system manufacturer of each particular kind of peripheral, along with those who produce plug compatible equivalents of each product type. Manufacturers of competing systems and peripherals plug compatible with competing systems would not be included.

Several considerations warrant caution, however, in defining each type of peripheral as a separate submarket. As the trial court itself noted, the trend among leading PCM's as well as systems manufacturers is toward full-line manufacturing and package selling of peripherals. Such selling may be dictated by design, marketing, installation, and maintenance economies of scale that enable peripheral manufacturers to offer product packages at a significant discount over the regular prices of the packages' indi-

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also refrain from taking on a large, successful competitor such as IBM and, instead, concentrate on profitable sectors where the competition is less substantial.

<sup>93</sup> It would be impossible for IBM to have a high market share in a general peripheral equipment market without having high shares of each of the major segments thereof (in terms of units sold and revenue gained).

vidual components. These packages would then become a new "product" and market.<sup>94</sup> Moreover, constantly improving technology toward an accepted industry design goal of product integration may make the submarkets obsolete as more and more functions are combined in a single box.

### 3. Systems Market versus Plug Compatible Market

The district court failed to distinguish between users who replace peripherals on an existing system and those who buy peripherals as part of a new system purchase. This latter group can be viewed as comprising a separate market in which the system itself is the relevant product. Since peripheral equipment now comprises 50 to 75 percent of the price of a new system, it is becoming an increasingly important factor in new system purchases. Systems manufacturers' peripherals compete in the systems market to the extent that peripherals govern customer choices among systems built entirely by such manufacturers.<sup>95</sup> Full-line PCM's compete in this same market either as formal marketers of complete systems retailing their peripherals in combination with other manufacturers' CPU's,<sup>96</sup> or as de facto systems marketers when customers choose a system based on the price/performance of its available plug compatible peripherals.<sup>97</sup>

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<sup>94</sup> For example, assume that Telex offers IBM-compatible communication controllers, disks, and printers at arbitrarily chosen prices of \$20,000, \$23,000, and \$19,000 respectively. If Memorex offers its equivalents at \$23,000, \$22,000, and \$16,000, a user would ordinarily choose a Telex controller with a Memorex disk and printer. If, however, Telex and Memorex each offer 6 percent package discounts, the user will choose the Memorex package, which has therefore become the new "product." The tendency for packages to become the relevant products will intensify with larger package discounts and with larger numbers of peripherals per package. If the package becomes the product, many non-full-line manufacturers who do not utilize products of others to assemble packages would compete as suppliers to final manufacturers or package marketers.

<sup>95</sup> For example, if one systems manufacturer offers its CPU at a price of \$24,000 and its peripheral equipment for \$20,000 (software, design, and installation costs being proportionately divided between the CPU and the peripherals), while a second systems manufacturer offers its CPU for \$23,000 but its peripheral equipment for \$22,000, and assuming equivalent performance characteristics between the two systems, the price of the peripheral equipment will determine the choice of systems.

<sup>96</sup> Telex and other major PCM's have offered new systems consisting of their peripheral equipment and IBM CPU's.

<sup>97</sup> For example, if the second competitor in the example given in note 95 *supra* were IBM, and Telex could offer the user IBM plug compatible peripheral equipment for \$20,000 rather than IBM's price of \$22,000, Telex would successfully sell both its peripheral equipment and the entire IBM-based system.

Smaller PCM's who make a limited range of products would be included in systems competition only in the rare case where their products account for at least one-half of a system's price. In addition, all systems manufacturers and PCM's face competition within the district court's submarkets from makers of plug compatible equivalents as it is fairly common for customers to substitute PCM products for standard peripherals at the time of system purchase. As a manufacturer of a relatively wide variety of peripherals, Telex should have faced substantial competition on a systems level from the manufacturer of the system with which its peripherals are plug compatible (IBM), non-IBM systems manufacturers, and those full-line plug compatible manufacturers which make peripherals compatible with, or market, non-IBM systems.

Once a user has installed a system, substantial conversion costs are attendant to any attempt to change systems. These costs include those of reprogramming, retraining personnel, and installing the new system. In its Tenth Circuit brief, IBM argued that, when a salesman of Control Data Corporation calls on an IBM customer, he attempts to obtain a conversion to a Control Data system as well as to sell Control Data peripheral replacements on a box-for-box basis.<sup>98</sup> But his chance of obtaining the system conversion is substantially less than that of obtaining the box-for-box conversion. To the extent that peripheral-based price/performance advantages of competing systems can, however, overcome the conversion cost barrier, their ability to do so creates systems competition similar to that encountered with new systems.<sup>99</sup>

While the district court recognized that systems competition is distinct from box-for-box peripheral submarket competition, it appears that the court did not follow its distinction in measuring market shares, as it did not attempt to ascertain what proportion

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<sup>98</sup> Brief for Appellant at 74.

<sup>99</sup> Certain classes of customers might be more amenable to systems conversions than others. For instance, a large customer which has had experience with or employs several different systems and also employs sophisticated personnel may well be able to absorb more of what would otherwise make up the conversion cost barrier. Systems manufacturers might also be especially willing to cut prices to gain a toehold on a significant portion of this customer's business, at least to the extent that product price discrimination is not illegally utilized.

of the total IBM and PCM peripheral installations was made as a result of new system purchases and what proportion was made replacing on a box-for-box basis.

#### 4. Third Generation versus Fourth Generation Products

How is the relevant market affected by the "fourth generation" peripheral products? IBM argued to the court of appeals that the district court had unfairly lumped together fourth generation peripherals, in which IBM generally had the originator's "natural monopoly" during the period under review, with third generation peripherals, in which IBM's sales were rapidly declining. Telex replied that the statistics showed IBM's third generation erosion was due to customer replacement of IBM third generation peripherals with IBM fourth generation peripherals rather than with PCM products.

Although the Tenth Circuit did not consider the question, the answer lies in whether the fourth generation product actually has, as the new "generation" nomenclature would imply, sufficiently superior price/performance characteristics to constitute a new market for a substantial number of users. It should be remembered, however, that while price and performance are theoretically two sides of a single balance, a point will be reached at which some users will no longer require the improved performance of a new generation's products. Thus, any price increase may result in their continuing with existing systems or employing other systems which offer comparable performance at a lower price, such as competitors' products of the same generation or new, smaller systems.

If the fourth generation products offer markedly better price/performance, substantial numbers of new customers will purchase only fourth generation systems, including their peripherals. Moreover, most of those who already have systems will replace them with fourth generation systems or will, depending upon available product combinations,<sup>100</sup> price, and need, replace only their peripherals with fourth generation peripherals. Where systems are to be replaced, a fourth generation systems competition would arise, as discussed above, among systems and full-line

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<sup>100</sup> In medium-sized and large systems, IBM fourth generation peripherals are frequently plug compatible with third generation CPU's.

peripheral manufacturers. Where the user replaces only its peripherals, competition would be confined to the manufacturers of plug compatible equivalents. Where the user seeks to replace only its peripherals, but no fourth generation products are available which are plug compatible with its present CPU, its need for fourth generation products will create systems competition, because the price/performance characteristics of the new peripherals will overcome the conversion cost barrier; this is true even though the system conversion might utilize a third generation CPU with fourth generation peripherals. Once fourth generation systems have been installed and PCM's have begun to develop peripheral copies and/or competing systems manufacturers have changed interfaces on non-compatible fourth generation products to make them plug compatible, box-for-box submarket competition will arise.

In all fourth generation markets, some time will elapse between the innovator's first shipments and those of its competitors. For the PCM's, this time should be regarded as one in which the innovator, IBM, has a "natural monopoly" prior to the inevitable imitation of its product by Telex and others who will market the copy at a lower price due to lower total costs. As to systems competitors, who may or may not decide to compete in both the systems and plug compatible markets, the length of time which elapses could become important in a general computer industry monopolization case should the competitor prove unable to produce fourth generation equipment of similar quality within a reasonable time. This factor is not of importance here, however, because IBM's declining market shares of general systems revenues were held insufficient to raise an inference of monopoly power.

Support can be found in the record for the proposition that fourth generation products form separate markets, particularly for tapes.<sup>101</sup> The first significant fourth generation tape shipments apparently began in September 1971, and, between that time and September 1972, 24,015 such units were shipped by IBM and the PCM's. During approximately the same period of time, third generation tape installations decreased by 18,902 units, from 41,409

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<sup>101</sup> See text accompanying notes 102-04 *infra*.



in June 1971 to 22,507 in December 1972. The district court found that the 3420 tapes "incorporated significant technological innovations not found in prior tape devices,"<sup>102</sup> and stated that the "Aspen [3420] control units and tape drive embodied significant new technology."<sup>103</sup> In the 17 months following the first significant shipments of fourth generation disks in August 1971, 12,723 of the IBM and PCM disks were sold or leased. During approximately the same period of time, third generation disk installations declined by 4,596, leaving a total of 69,274 third generation disks in use in December 1972. The district court described the Merlin 3830 disk control unit as "innovative."<sup>104</sup>

On the other hand, the continued growth through the same period of PCM installations of third generation tapes and disks combined with the significant decrease in IBM customers utilizing third generation products may indicate that for a substantial number of users the third generation price advantages more than offset performance benefits from fourth generation products. In this connection it should be noted that one of the stated purposes of the IBM 2319A disks was "to provide a lower priced and smaller disk than Merlin [the fourth generation disk] for use with the smaller versions of the new System 370 to meet systems and peripheral competition . . . ."<sup>105</sup> In addition, IBM's Mr. Whitcomb testified that IBM "viewed the combination selling of products by Telex as threatening the migration of 360 users to the 370 system."<sup>106</sup>

If the fourth generation peripherals do have sufficient advantages to be considered a separate market, the district court erred in grouping together third and fourth generation market shares. In this event, third generation markets would include those customers who are primarily concerned with price and not with increased performance, as well as those who have not yet moved into fourth generation products for financial or other reasons but plan to do so. IBM's share of these markets should not be considered sufficient in itself to produce a strong inference of monopoly

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<sup>102</sup> 367 F. Supp. at 296.

<sup>103</sup> *Id.* at 318.

<sup>104</sup> *Id.* at 323.

<sup>105</sup> Brief for Appellant at 83.

<sup>106</sup> Brief for Appellees at 53.

power. Even if the district court is correct in its definition of "IBM" equipment as including user-owned and leasing-company-owned peripherals and in its method of stating percentage shares, the PCM share of third generation tapes rose steadily from 10.2 percent in December 1970 to 21.6 percent in December 1972. The PCM share of third generation disks during the same period rose from 6.8 percent to 20.6 percent. In fourth generation products, IBM should be credited with natural monopoly advantages, which were being rapidly eroded by the PCM's.<sup>107</sup>

#### B. *Market Share Measurement*<sup>108</sup>

Apart from the district court's failure to distinguish peripherals installed on new IBM systems as part of system conversions from those replaced on a box-for-box basis and the possible need to distinguish third from fourth generation products, significant problems remain in the district court's use of statistics to produce an inference of monopoly power. The district court considered as "IBM" equipment at each of the five measuring points in its December 1970 to December 1972 statistical measuring period all tapes and disks which had been manufactured by IBM and were owned by IBM, users, or leasing companies<sup>109</sup> and in-

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<sup>107</sup> Telex's fourth generation tape copies became available in November 1971 and its disk copies became available in October 1972. Telex's first memory copy was available in November 1972.

<sup>108</sup> In the following discussion the district court's statistics referred to are those contained in the table accompanying note 42 *supra*.

<sup>109</sup> The trial court's inclusion of leasing company owned IBM equipment in the IBM share, rather than viewing some or all leasing companies as in competition with IBM, was not erroneous, although IBM argued to the Tenth Circuit that this inclusion was inconsistent with other findings of the district court. IBM is paid full value for the product when the leasing company buys it, and a measurement of manufacturer revenues should include the full payment when received from the leasing company. For purposes of computing unit sales, leases, or installations, however, IBM leases its equipment in competition with other manufacturers within the structure of the retail marketplace only at the time of the lease to the end user. The leasing company is analogous to an IBM wholesaler, not an IBM competitor. The leasing company purchases equipment from IBM at, in effect, a wholesaler's price, due to its use of accelerated depreciation allowances and the investment tax credit. It then charges the end user a rental which is presumably below that charged by IBM on direct leases. If the rental is sufficiently in range of that charged by IBM so that it does not make the difference in the end user's choice of systems, the leasing companies' product should be classified as that of IBM in the competition for the end user's business. The offer to the end user by IBM itself is effectively replaced by a discount to which IBM had separately committed itself in advance. If, on the other hand, the leasing company is substantially below IBM in price so that it obtains a system contract which IBM would

stalled on IBM-based systems. This number was then compared with the "PCM" number at each point in the measuring period to create the percentages relied upon. The district court indicated that the PCM share includes installed PCM-manufactured equipment owned by users and leasing companies.<sup>110</sup> Since only the total PCM share is given, it is impossible to determine the separate effects of PCM sales and leases.

The trial court failed, then, to measure the market shares of new sales and leases and new installations during the 1969-72 period. New leases should include renewals of lease contracts on equipment already installed. The defendant should not be penalized for dominating the market during an earlier time which may not be the subject of any complaint and should be credited with the full effect of progressively increasing sales of its competitors. Market share measurements under section 7 of the Clayton Act customarily examine annual sales, as in *United States v. Von's Grocery Co.*<sup>111</sup> and *United States v. General Dynamics Corp.*<sup>112</sup> The same principle has been followed in section 2 monopolization cases. Judge Hand, in *Alcoa*, relied upon annual sales percentages for each of a number of years.<sup>113</sup>

To determine the number of new sales and leases made by IBM between December 1971 and December 1972, the increases in all the peripheral categories of the IBM share within the period should be compared with the total "PCM" increase during the same period, *i.e.*, the figures as of December 1971 should be subtracted from those of December 1972. IBM equipment owned by users and leasing companies in December 1971 clearly cannot be

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otherwise lose, the leasing company offer should be similarly treated as an "IBM" price reduction to win the contract. Leasing company owned equipment which was in inventory and not on rent to customers correctly was not included in current unit installations by the trial court.

<sup>110</sup> "[B]oth the PCM's and IBM's share including all devices marketed by them whether leased or sold." 367 F. Supp. at 288. IBM argued to the Tenth Circuit, however, that equipment sold by the PCM's had not been so included. Brief for Appellant at 29.

<sup>111</sup> 384 U.S. 270 (1966).

<sup>112</sup> 415 U.S. 486 (1974).

<sup>113</sup> See also *United States v. Grinnell Corp.*, 384 U.S. 563 (1966). *Von's Grocery*, *General Dynamics*, *Alcoa*, and *Grinnell* involved groceries, coal, aluminium, and protection services; the first three are commodities which are not leased, and the fourth is a service not subject to the kind of leases found in the computer industry. Coal is also the subject of long-term requirements contracts.

said to have been sold thereafter. IBM-owned equipment leased to users as of December 1971 should similarly not be considered as having been re-leased within the next year, because by December 1971 it can be inferred the bulk of such leased equipment was under the fixed-term plan.<sup>114</sup> Assuming that the FTP penalty provisions acted to hold FTP users to their leases, most IBM equipment under FTP leases as of December 1971 must be deemed to have been under the same leases for the next year. The exception would be 1-year FTP leases signed prior to late December 1971, but, in the absence of statistics showing the number of such leases, their effect cannot be measured. PCM leases in effect as of December 1971 must also generally be deemed to have continued through the next year due to widespread PCM employment of long-term leases.<sup>115</sup>

The numbers of certain models of installed IBM-owned and leasing-company-owned IBM equipment actually declined between December 1971 and December 1972. These decreases should not be subtracted from increases in user-owned equipment, because a sale of a previously leased IBM product by either IBM or a leasing company should be considered a new sale of IBM equipment,<sup>116</sup> even though the equipment was previously under lease.

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<sup>114</sup> By July 22, 1971, within 2 months of FTP's introduction, 40 percent of IBM's installed disks, tapes, and printers had been placed under the fixed-term plan. When IBM's fourth generation disks and tapes became available in August and September 1971, respectively, 90 percent of them were installed under FTP.

<sup>115</sup> It is likely, however, that more PCM and IBM leases expired during the year because many of them had commenced before IBM's initiation of FTP between July and September 1971. Because the PCM shares are not subdivided into sold and leased equipment, it is arbitrarily assumed that all PCM units were owned by PCM's and leased to users.

<sup>116</sup> This proportion is clear when applied to sales of formerly leased equipment which is owned by IBM. With regard to leasing-company-owned equipment, see the discussion in note 109 *supra*.

This inability to offset reduced numbers of leased equipment against increased numbers of newly sold equipment is not present with measurement of revenue shares, where a unit's contribution to revenue resulting from its sale will be offset in part by its ceasing to provide revenue as a leased product. To this extent, the combination of sales and leases in one series of measurements, especially without revenue statistics, does not present a complete picture of the market.

The only revenue statistics cited by the district court were for 1970 and, thus, did not cover the period measured by the charts on unit sales and leases. The revenue statistics showed that in 1970 IBM had 90 percent of tape revenues and 68 percent of disk revenues, with the PCM's receiving 10 percent and 32 percent respectively.

If separate markets do not exist for third and fourth generation products, new sales and leases can be computed by aggregating third and fourth generation equipment owned by both IBM and the PCM's on December 1971 and subtracting the total from the total number of such installations on December 1972. But, if separate markets do exist for each generation, then, since IBM third generation disk and tape installations and PCM third generation tape installations decreased over the year, these decreases must be offset against the increases in fourth generation products, because both IBM and PCM leases in effect as of December 1971 are deemed to have been long term. These third generation lessees are presumed to have been able to break or modify their leases without incurring termination penalties only by switching to the fourth generation products of their lessors. Thus, only the number by which fourth generation leases entered into through the year exceeds the decline in third generation leases during the same period can be counted as the number of leases newly made.

When new sales and leases between December 1971 and December 1972 are computed according to the methods just described, the following market shares result. For all tapes, IBM's share is 81.8 percent and the PCM share is 18.2 percent. In third generation tapes, PCM installations declined, and IBM's increase of 706 user-owned units thereby gives it 100 percent, even though IBM suffered a decline in its leased units of 15,892. In fourth generation tapes, IBM's share is 90.2 percent, and the PCM share is 9.8 percent. For all disks, IBM's share is 54.7 percent and the PCM share is 45.3 percent. In third generation disks, IBM's share is 44.3 percent and the PCM share is 55.7 percent; IBM's share is due to an increase of 1,556 user-owned units, as its leased units declined by 8,937. In fourth generation disks, IBM's share is 99.1 percent, and the PCM's share is .9 percent.<sup>117</sup>

To measure new sales and leases between December 1970 and December 1971, the same method should be used, with one possi-

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<sup>117</sup> The respective shares of new sales and leases of tapes and disks together, which becomes important if the district court's submarket boundary between the two is not justified, are as follows: IBM had 69.6 percent and the PCM's 30.4 percent of all tapes and disks. IBM had 53.6 percent and the PCM's 46.4 percent of third generation tapes and disks. IBM had 93.1 percent and the PCM's 6.9 percent of fourth generation tapes and disks.

ble exception. It could be argued that merely examining the increase in IBM-owned product installations between December 1970 and June 1971, and possibly between December 1970 and December 1971, does not accurately portray new leases during those periods, because, prior to IBM's inauguration of FTP, all of its leases were 30-day rentals. Thus, all of those who were IBM lessees in December 1970 were making "new" decisions monthly to lease IBM products without constraint from lease termination penalties or other barriers until the introduction and widespread acceptance of FTP during the second half of 1971. This exception would not apply to leasing companies because of their general employment of long-term leases. Similarly, it would appear that PCM leases were largely long term during the entire 1970-72 period.

If all installations of IBM-owned equipment are counted as having been new leases made between December 1970 and December 1971, but only the increase in installations of PCM units within the same period is counted as new leases, IBM's market shares are extremely high. Because of the variance between these high market shares and those obtained during the next year's period as discussed above, not to mention the sharp increase in the absolute number of PCM installations while the total number of IBM installations was declining, this method of measuring new leases is not thought to reflect accurately the dynamics of the market between December 1970 and December 1971.<sup>118</sup>

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<sup>118</sup> Utilizing this method of measurement, IBM's share of third generation tapes sold and leased between December 1970 and June 1971 was 94.5 percent. IBM had 87.5 percent of third generation disks for the same period, since significant numbers of fourth generation products had not yet become available.

For December 1970 to December 1971, IBM had 93.1 percent of third generation tapes, 99.7 percent of fourth generation tapes, and 93.8 percent of all tapes. For the same period, the PCM's had 6.9 percent of third generation tapes, 0.3 percent of fourth generation tapes (PCM fourth generation tapes having just become available), and 6.2 percent of all tapes. IBM had 84.6 percent of third generation disks, 100 percent of fourth generation disks, and 85.4 percent of all disks. The PCM's had 15.4 percent, 0 percent, and 14.6 percent, respectively, PCM fourth generation disks not having become available. It should be noted that these market shares were computed by offsetting increases in user-owned equipment with decreases in leasing-company-owned equipment, although the other statistics on new sales and leases do not include such an offset as discussed above. Without the offset, IBM's market shares were even higher.

When all PCM units as of December 1971 are counted as if they were on short-term leases similar to those of IBM, the IBM shares decrease to about 80 percent for third generation and all tapes and 78 percent for third generation and all disks.

Examination of the shares of new installations as opposed to new sales and leases shows that, of the combined third and fourth generation increase in tape installations between December 1970 and December 1972, the PCM share was 48.6 percent. Of the total increase in disk installations during the same period, the PCM share was 80.6 percent. IBM installations of third generation tapes declined substantially, while the PCM's posted an increase. Both IBM and PCM fourth generation tape installations rose quickly although IBM still held 91.3 percent of the fourth generation installations on December 1972. This share, however, seems to be explained in large measure by IBM's lead time advantage. IBM's third generation disk installations declined, while PCM installations almost tripled. The PCM's were just beginning to market their fourth generation disks at the end of the measuring period.<sup>119</sup>

The above statistics thus indicate that between December 1971 and December 1972, when all of IBM's challenged acts including FTP were in effect, IBM did not have sufficient shares of new disk or combined tape and disk sales and leases to create an inference of monopoly power, assuming that third and fourth generation products should be combined in one market. IBM's relatively high share of new tape sales and leases is considerably

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These statistics are greatly at variance with those obtained for the second year (December 1971 to December 1972), even though the FTP leases, which apparently benefited IBM, were only in effect during the second year. The counting of all of IBM's owned equipment on December or June 1971 as newly leased is probably misleading because IBM lessees, although renewing 30-day leases, may well have been abandoning such leases as rapidly as possible. Telex installations were increasing sharply as IBM's lease base declined and PCM capacity may have been approaching its limits. Moreover, the period involved is a very short one, and PCM marketing and installation personnel may have been hard put to increase the conversion rate even had the necessary products been manufactured. Only 6 months elapsed from December 1970 until IBM announced FTP, and 40 percent of IBM's lessees signed up under FTP within 2 months after its announcement. It therefore appears that for the 6 to 12 months prior to FTP's having come into full effect, either statistics derived through the method used for the second year or shares of sales growth, *i.e.*, new installations, would more accurately portray market realities than do statistics of actual sales and leases compiled on the assumption that all IBM-owned equipment can be considered as having been newly leased within the said period.

<sup>119</sup> The respective shares of new installations of tapes and disks together are 29.8 percent for IBM and 70.2 percent for the PCM's. The respective shares of new installations between December 1971 and December 1972 are as follows: IBM had 76.1 percent of tapes and 50.2 percent of disks; the PCM's had 23.9 percent and 49.8 percent respectively; for tapes and disks together, IBM had 63.5 percent and the PCM's had 36.5 percent.

less impressive when the heavy decline in leases is placed against the increase in sales. If third and fourth generation products form separate markets, IBM's large fourth generation shares can be attributed to "natural monopoly" advantages, but with rapid PCM advances having been made in tapes. The PCM's obtained 55.7 percent of third generation new disk sales and leases. In third generation tapes, IBM obtained 100 percent, but this share is, again, put into perspective by the decline in leased units. These statistics, in conjunction with those pertaining to the relative shares of new installations over the 2-year period for which statistics were available, raise substantial questions of whether the district court's aggregate IBM "market shares" in fact reflect the dynamics of the relevant markets and submarkets during the period under review.

In summary, the district court made three fundamental errors in its market share measurements. First, it erred in not examining new sales and leases made within the 1970-72 period (particularly those between 1971 and 1972) and in not computing the percentage shares of new installations during the same period. Second, the court apparently grouped together the peripherals sold as parts of new systems with those sold as plug-for-plug replacements, thus failing to distinguish between what it had found to be two separate markets. A third probable error consisted of joining third generation and fourth generation market shares. The effect of the first error was to mask rather considerably the market dynamics during the period measured. The effect of the second is unclear, although it seems reasonable to infer that the error hurt IBM more than it did Telex, because of IBM's greater proportion of systems sales to total sales. The effect of the third error was a failure to show strong PCM advances in the third generation markets while wrongfully condemning IBM for its high market shares in the fourth generation markets, where it held the originator's "natural monopoly."

*C. Other Pertinent Factors in Determining Whether Monopoly Power Exists*

Courts should apply to monopolization cases the type of analysis found in *United States v. General Dynamics Corp.*,<sup>120</sup>

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<sup>120</sup> 415 U.S. 486 (1974).



where market share was held to be only one factor to be considered in determining the legality of a merger, one which must be measured against those industry forces tending to explain or change the market share.

In *General Dynamics* the Supreme Court conceded that the Government's market share statistics as to industry concentration were "roughly comparable" to those in *United States v. Von's Grocery Co.*,<sup>121</sup> which invalidated a merger of the third and sixth largest grocery store chains in the Los Angeles market. The merger produced an increase of 1.1 percent in the market share of the two largest firms in the market and 3.3 percent in the share of the six largest firms. The Court's opinion in *Von's Grocery* was written over a strong dissent by Justice Stewart, joined by Justice Harlan. The dissent detailed the competitive structure of the grocery industry in Los Angeles and concluded that

[t]here is simply no evidence in the record, and the Court makes no attempt to demonstrate, that the increment in market share obtained by the combined stores can be equated with an increase in the market power of the combined firm.<sup>122</sup>

In *General Dynamics* Justice Stewart, writing for the Court, restated what he viewed as the principle of *Von's Grocery* and other leading merger cases of the 1960's, as allowing

the Government to rest its case [that a merger is likely to substantially lessen competition] on a showing of even small increases of market share or market concentration in those industries or markets where concentration is already great or has been recently increasing . . . .<sup>123</sup>

The Court also said that in the past "this Court has found prima facie violations of [section] 7 of the Clayton Act from aggregate statistics of the sort relied on by the United States in this case."<sup>124</sup> But the Court emphasized that the Government's prima facie showing should fail if outweighed by "other pertinent factors." In *General Dynamics* these factors included the relative decline of the coal industry vis-a-vis other energy sources, the coal industry's widespread use of long-term requirements contracts which

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<sup>121</sup> 384 U.S. 270 (1966).

<sup>122</sup> *Id.* at 297.

<sup>123</sup> 415 U.S. at 497.

<sup>124</sup> *Id.* at 496.

effectively controlled and explained production statistics, and the relatively small coal reserves held by the post-merger firm. These factors were held to so outweigh the Government's market share statistics as to render unnecessary a review of the district court's rejection of the Government's proposed relevant markets, because "the Government's statistical presentation simply did not establish that a substantial lessening of competition was likely to occur in any market."<sup>125</sup>

When one moves beyond measurement of market shares to a more general examination of the peripheral equipment market, other factors appear which make the claim of monopoly power difficult to sustain. Perhaps the most important factor in addition to the market shares of those already in the market is the ease with which potential competitors can enter. Monopoly power is, after all, "the power to control prices or unreasonably restrict competition."<sup>126</sup> The district court found that

entry was initially easy for peripheral equipment manufacturers because they could choose to copy only proven successful products. Moreover, they could utilize in many instances systems hardware provided by the system manufacturer and typically would sell only after all systems engineering, systems marketing, site preparation and systems installation work had been completed.<sup>127</sup>

With lower total costs than the systems manufacturers, the PCM's can allow them to incur all development costs, duplicate their products through reverse engineering, and then bring copies to market at a lower price.

Entry into the general computer industry has also been easy. Between 1952 and 1970 the number of industry participants increased from 13 to 1773. The number of systems manufacturers increased from 3 in 1952 to 96 in 1972. The systems manufacturers include some of the largest and most sophisticated electronics companies, such as Sperry Rand Univac, Honeywell, Control Data, Burroughs, and others. United States Bureau of the Census figures show IBM's revenue shares of the general computer industry to be well below 50 percent and generally in the 36 to 45 percent range. This share has consistently declined over time.<sup>128</sup>

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<sup>125</sup> *Id.* at 511.

<sup>126</sup> 367 F. Supp. at 336.

<sup>127</sup> *Id.* at 286-87.

<sup>128</sup> The district court made reference to certain IBM internal documents, apparently

Systems manufacturers generally need only change interfaces to adapt peripherals from one system to another. Both the district court and the Tenth Circuit agreed that the cost of such interface changes "has not constituted a substantial portion of the development cost of the peripheral device."<sup>129</sup> The total cost to Telex to adapt one of its early tape drives for use with an IBM system was \$42,000. IBM's evidence showed that the cost of an interface modification is less than 1 percent of the product's purchase price.<sup>130</sup>

In addition major systems competitors are already active in the IBM plug compatible market, although their products are often marketed through intermediate assemblers and distributors. Control Data not only markets IBM plug compatible peripherals under its own name, but also supplies Telex with printer mechanisms. Sperry Rand, through its Information Storage Systems subsidiary, supplies Telex with its disk drives. Telex is presumably able to offer marketing and other economies which make it feasible for Sperry to proceed through it rather than directly marketing to IBM customers. As soon as IBM announced its 2319B price reduction, Information Storage Systems granted Telex a 28 percent price reduction on disk drives. There has also been some movement by PCM's toward full systems competition. Memorex announced two complete systems in 1972. Texas Instruments, originally a component manufacturer, markets what was at the time of the district court trial the world's fastest CPU.

One specific consequence of the actual and potential involvement of large systems manufacturers in the IBM plug compatible market is to cast considerable doubt on any validity which the district court's CPU offset theory might otherwise have. The court found that IBM had offset FTP price reductions with 4 to 8 percent price increases on CPU's and other equipment in 1971 and had in 1972 offered Models 158 and 168 of its System 370 CPU at an unduly high price to subsidize the low price of the field

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based on unit sales and leases, which put IBM's share of the domestic systems and peripherals market at 75.9 percent in December 1964 and 73.3 percent in September 1968, with IBM's share of CPU's decreasing during the same period from 68.6 percent to 64.4 percent. These and similar figures are relied upon by the Justice Department in its action against IBM.

<sup>129</sup> 367 F. Supp. at 278.

<sup>130</sup> Brief for Appellant at 22.

effect transistor memories offered with the 158 and 168 CPU's. The offset holding has some initial difficulty in that such a notion has usually referred to the use of monopoly power or similar reserves in one market to gain extra advantages in competitive markets.<sup>131</sup> And yet, the district court found that IBM's market share of the general systems market did not in itself justify any inference of monopoly power. This market was also described by the district court as seeming "competitive and dynamic."<sup>132</sup> Thus, any attempt by IBM to "offset" lower peripheral prices in the plug compatible markets with price increases in the general systems market should result in lost sales. Because the systems and plug compatible markets are linked, such an attempted offset would also hurt both IBM and the PCM's in the plug compatible markets by reducing the number of IBM systems which constitute the latter markets.<sup>133</sup> Even if, however, such an offset were economically feasible for IBM, there is nothing to suggest that the other systems manufacturers who are active in the IBM plug compatible markets could not engage in similar subsidization. In its variety of products, Sperry Rand is far more diverse than IBM. There would appear to be nothing to prevent Sperry from offsetting plug compatible pricing actions with systems price increases or, for that matter, with price increases in its farm equipment or other product lines, thus utilizing one of the supposed advantages of the conglomerate or multi-industry company.<sup>134</sup>

The extremely fast growth of the computer industry, from revenues of \$48 million in 1952 to \$10.2 billion in 1970, militates against stagnant and dominant market power, particularly that resulting from single firm growth.<sup>135</sup>

Another important factor to be weighed is the "marked increase in the sophistication of EDP customers in the last few

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<sup>131</sup> See *United States v. Griffith*, 334 U.S. 100 (1948).

<sup>132</sup> 367 F. Supp. at 286.

<sup>133</sup> Another consequence of the interdependence between the systems and peripheral markets is that IBM pricing actions in the former will bind it in the latter.

<sup>134</sup> Other plug compatible competitors, such as Honeywell and Control Data, should likewise be able to engage in such subsidization.

<sup>135</sup> Gabriel Kolko, in the *Triumph of Conservatism*, provides a well-documented study of the inability of even the classical turn-of-the-century monopolists to prevent market share decline in the face of rapidly expanding markets. G. KOLKO, *THE TRIUMPH OF CONSERVATISM* (1963). See also the dissent of Justice Stewart in *United States v. Von's Grocery*, 384 U.S. 270, 281 (1966).

years."<sup>136</sup> The district court pointed out that most computer systems are installed in the 500 largest governmental and business organizations.<sup>137</sup> Indeed, IBM's 2319 pricing actions were based upon increasing concern with plug compatible competition which had been

intensified in January of 1970 when IBM learned that the Bureau of the Budget intended to encourage federal agencies to use equivalent lower cost peripheral equipment compatible with CPU's supplied by IBM and by other systems manufacturers and suggested the utilization of standard interfaces.<sup>138</sup>

The 1969-1972 time frame was a narrow one. PCM's had not engaged in any significant marketing of IBM plug compatible peripherals until 1966. In third generation products the substantial effects of this competition were taking their toll throughout the period measured. Telex did not offer its first IBM plug compatible disk drive until August 1969. Prior to this disk offering, Telex had offered tapes in August 1966 and in March 1968. After the August 1969 disk offering, other product introductions by Telex continued throughout the period measured. PCM's had barely begun to market fourth generation disks when the measuring period ended and had only marketed fourth generation tapes for approximately the last year of the same period.

IBM's success in the peripheral markets was not a result of patent monopolies. IBM has developed over 10,000 computer industry patents which are freely licensed, none of which had been abused or was directly involved in the *Telex* case.

Although the rate of decline was not always uniform, all of IBM's market shares were in steady decline throughout the 1969-1972 period. IBM and the other systems manufacturers have higher total costs than the PCM's, and they can recoup such costs against PCM competition only by the constant introduction of improved products. In an internal document relied upon by the district court, IBM stated with regard to the anticipated competitive situation upon the expiration of the initial round of FTP contracts:

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<sup>136</sup> 367 F. Supp. at 272.

<sup>137</sup> *Id.*

<sup>138</sup> *Id.* at 291.

While the PC competitors will make a strong effort, it is assumed that near-term 3330 erosion will be contained until the FTP contracts approach maturity. By that time, Winchester, Iceberg [both new products], the 3330A/B and the 333M will all be available as customer options and should hold the market for IBM.<sup>139</sup>

IBM could hope to slow its market share decline only by introducing products offering improved performance and by reducing its prices where necessary, under pressure from both PCM's and systems competitors. Rather than evidencing IBM's power to raise prices or exclude competitors, the record shows that "[g]enerally speaking, EDP customers have been furnished with progressively better products at progressively lower prices,"<sup>140</sup> and this trend was particularly characteristic of the plug compatible markets during the period under review.

#### D. Acts of Monopolization

The Tenth Circuit held that IBM's acts did not constitute the use of monopoly power because they involved ordinary marketing methods utilized by or available to all competitors.<sup>141</sup> The court relied particularly on the absence of below-cost pricing or other subsidizing of plug compatible market activities. The cases cited by the Tenth Circuit involved practices well beyond those normally utilized by business competitors. In *United States v. Griffith*<sup>142</sup> the defendants clearly possessed monopoly power in certain towns and were held to have used it to obtain competitive advantages in other areas. In *United States v. Grinnell Corp.*<sup>143</sup> improper contracts and acquisitions were found to have been effected. In *United States v. Swift & Co.*<sup>144</sup> abuse of size and power was found. In *American Tobacco Co. v. United States*<sup>145</sup> a conspiracy existed.

The fact that these four cases involved clearly predatory tactics does not mean that such tactics are requisite for acts of monopolization. *Alcoa* stated that to limit acts of monopolization

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<sup>139</sup> *Id.* at 303, quoting from IBM internal documents.

<sup>140</sup> *Id.* at 285. See note 40 *supra*.

<sup>141</sup> 510 F.2d at 926.

<sup>142</sup> 334 U.S. 100 (1948).

<sup>143</sup> 384 U.S. 563 (1966).

<sup>144</sup> 286 U.S. 106 (1932).

<sup>145</sup> 328 U.S. 781 (1946).

to manuevers not honestly industrial . . . would in our judgment emasculate the [Sherman] Act. . . . We disregard any question of "intent." . . . [Once monopoly power is shown to exist], the issue of intent ceases to have any importance; no intent is relevant except that which is relevant to bring about the forbidden act . . . no monopolist monopolizes unconscious of what he is doing.<sup>146</sup>

The Tenth Circuit's requirement of use of monopoly power seems to conflict with this language and the apparent *Alcoa* holding that mere anticipation of increases in the demand for Alcoa's product, aluminum ingot, and the constant expansion of capacity to meet this demand, was a sufficient act of monopolization under section 2. These acts of Alcoa were or would have been normal competitive responses available to other competitors, and in the absence of Alcoa's high share of what the Second Circuit found to be the relevant market, they would indeed have been laudatory. Justice Reed said for the Supreme Court in *United States v. E. I. du Pont de Nemours & Co.*:

[T]his Court's conclusion in prior cases [has been] that, when an alleged monopolist has power over price and competition, an intention to monopolize in a proper case may be assumed.<sup>147</sup>

Even the early authority supports the contention that, while monopoly power does not give rise to a conclusive presumption of an intention to monopolize, a rebuttable presumption may so arise. In *Standard Oil Co. v. United States*<sup>148</sup> the Supreme Court indicated that a presumption of intent to monopolize might arise from proof of the existence of monopoly power under certain circumstances.<sup>149</sup>

It is submitted, however, that the Tenth Circuit's concern over acts which are not extraordinary is relevant to the issue of whether monopoly power exists in the first place, particularly under the *General Dynamics* approach. If a defendant has accomplished whatever success it enjoys by ordinary marketing methods, another weight has been placed on the balance against a finding of monopoly power. But once this power is found to exist,

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<sup>146</sup> 148 F.2d at 431-32.

<sup>147</sup> 351 U.S. 377, 392 (1956) (footnotes omitted).

<sup>148</sup> 221 U.S. 1 (1911).

<sup>149</sup> *Id.* at 75. See also AMERICAN BAR ASS'N SECTION OF ANTITRUST LAW, ANTITRUST LAW DEVELOPMENTS 56 (1975).

the Tenth Circuit's view of the required act of monopolization is inappropriate, and the *Alcoa* standard should be followed.

Economic theory tells us that a rational, profit-maximizing firm truly possessed of monopoly power cannot avoid its use. By definition, the demand curve facing a monopolist is the same curve that faces the entire industry. Accordingly, each unit of output sold by the monopolist directly lowers the price per unit which it can receive. As a result the marginal revenue curve for a monopolist will always lie well below the demand curve. When the monopolist, like the firm in a competitive market, maximizes profits by setting its output and price at the point where marginal costs equal marginal revenues, its output will tend to be more restricted and its prices higher than if the marginal cost curve were allowed to intersect a marginal revenue curve closer, or equal, to the demand curve. Monopoly also tends to create long run excess capacity and production at relatively high costs.<sup>150</sup>

#### E. *Attempted Monopolization*

If this article's analysis of IBM's lack of monopoly power is correct, there can be no finding that any acts of IBM came "dangerously near" to accomplishing monopoly power in the relevant markets or might accomplish such a result if continued unchecked. The ultimate acts of IBM were ordinary and competitive in and of themselves. With regard to causation, the worst that can be said for all of IBM's acts taken together is that they may have slowed, but did not stop or reverse, the steady decline in IBM's market shares. They did not even slow the decline as to third generation products, and the PCM's also made significant

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<sup>150</sup> DORFMAN, *THE PRICE SYSTEM* 92-96 (1964). It would seem that only two reasons might exist for a monopolist's failure to maximize profits, assuming that its information does not misstate costs or other factors. The first would be to prevent a competitor from entering the market. In that case, competition is serving its purpose, and it is doubtful whether monopoly power exists. The second would be a desire to avoid the attention of antitrust authorities, or, failing that, to avoid liability for an "act" of monopolization. Avoidance of prosecution by this tactic seems a remote possibility at best and would probably have a chance of success only if the monopolist's profits were low in the first place. Avoidance of liability should be impossible because failure to maximize profits, which further impedes proper flow of capital and allocation of resources, should itself be considered an act of monopolization in these circumstances, as should the waste of resources inherent in deliberately paying more to produce an item than it is worth. Finally, insuring that the monopolist continue not to maximize profits would require a regulatory approach inimical to the purposes of the antitrust laws.



advances in fourth generation products. IBM's absolute share of fourth generation peripherals seems to have remained very high only because PCM activities had just begun.<sup>151</sup> It is suggested that a "specific intent" to monopolize can be shown only by acts which are not customarily used in business competition and which in fact cause or threaten monopoly power.

The district court found that IBM had exhibited a specific intent to monopolize because its actions were aimed directly at the PCM's and were undertaken only after study of the impact upon the PCM's and their future activities. Study of one's impact on competitors, however, is inevitable in all markets, save those of atomistic competition, and is widely engaged in by modern firms. IBM cited authority to the Tenth Circuit that "70 to 90% of American companies evaluate, study and analyze competitors and competitive products."<sup>152</sup> Such study is desirable because it enables both competitors and potential entrants to rationally allocate capital and price/performance moves where they are needed. Such study is virtually indispensable to the process of entry. Only by analyzing the position of existing competitors can capital know what return it will receive and where. Only by such study can one preparing to offer a better product or lower price

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<sup>151</sup> Telex and the district court were concerned about the FTP attempt to "lock in" customers, particularly on newly introduced fourth generation equipment. The leases, however, were only for a 2-year term, which was less than the term offered in the leases of many competitors. A large part of the 2-year period would have apparently, in the absence of unlawful appropriation of trade secrets, been necessary as PCM lead time to copy fourth generation IBM products. Furthermore, the strong and sophisticated customers in the computer industry might well have been willing to forego FTP in the expectation of near-term competitive offerings if the PCM's were able to reduce IBM's lead time. Howard Tilley, administrative assistant to Telex's chairman of the board, reported to the president of Telex in March 1972, as follows:

Of twenty customers surveyed, only three admit that FTP was a significant factor influencing their decision to cancel Telex in favor of IBM. Furthermore, these three list other reasons in conjunction with FTP . . . . No one indicated a willingness to be a witness although this point was not pursued vigorously for fear of damaging future customer relationships.

Additionally, this may be a dangerous approach since IBM could probably produce witnesses to the effect that no FTP agreement was signed because the customer knew that Telex would be offering an IBM replacement in the near future, probably at less cost. The survey found that Thiokol Chemical took a monthly lease on IBM 3420's and that Amoco Production did the same in anticipation of replacing them with Telex 6420's.

Brief for Appellant at 117.

<sup>152</sup> *Id.* at 98.

predict the marketplace's receptiveness. The record indicates that Telex thoroughly studied IBM product offerings and the effect of PCM pricing actions on IBM. It is inconceivable that Telex and other PCM's did not make such studies prior to their initial decisions to enter plug compatible markets. These studies would seem to be especially needed in the computer industry, where market definition is difficult due to the changing nature of product combinations and advancing technology. Both IBM and Telex must be able to identify those plug compatible markets where room exists for competing away present profits, thereby "injuring" present competitors. They must also be able to identify whether, and to what extent, their resources should be committed to plug compatible markets, as distinguished from systems competition.

Study of competitors, then, is a neutral and ordinarily acceptable technique. It is not an ultimate marketing action, but is only a means for making decisions to undertake price cuts or other activities. In no event should the requisite specific intent be considered established by decisionmaking techniques or intra-company memoranda, as distinguished from the objective character of ultimate acts. Memoranda may, in certain cases, help explain the objective nature of the act, but they often tend to confuse the issue. No matter how objectionable a memorandum's words may be, they are of little consequence if their only outcome is a routine marketing action. Conversely, a sophisticated company may well seek to mask arguably predatory acts, such as use of monopoly power in one market to subsidize activities in a competitive market, with the most innocuous of words. IBM engaged in actions designed to produce a 20 percent profit and was met by competitive responses on the part of the PCM's. In at least some instances, IBM's actions also lowered costs. It is from these characteristics that specific intent should be perceived, rather than from internal documents projecting the acts' effects on PCM's or, for that matter, expressing a hope that the effects would be injurious. If a firm acts in a routine manner, its knowledge that its actions will injure or destroy a competitor cannot create an affirmative duty to protect the competitor and should be of no consequence in determining specific intent to monopo-

lize.<sup>153</sup> *Times-Picayune Publishing Co. v. United States*<sup>154</sup> indicates that when the acts relied upon to establish specific intent are available to and used by other competitors, a finding of specific intent to monopolize is precluded regardless of the relevant market and the defendant's influence thereon.<sup>155</sup> The sensible justification for the *Times-Picayune* view is that, without its definition of specific intent, we are in reality back to the ordinary monopolization test, but with the possibility that by establishing only a "dangerous probability," rather than the actual existence of monopoly power, the plaintiff can reduce its burden of proof.

#### VI. SUGGESTED CHANGES IN PRESENT MONOPOLIZATION LAW AND POLICY

Now that the fear of conglomerates has been lessened by the economic situation, if not by Justice Department action, concentrated or oligopolistic industries have again become a principal concern of antitrust litigation and theory. The oil, breakfast cereal, and tire industries are presently subjects of antitrust litigation. Professors Posner<sup>156</sup> and Turner<sup>157</sup> are only two of the multitude who have wrestled with the problem of the extent to which companies, not shown to be in conventional agreement so as to subject them to liability under section 1 of the Sherman Act<sup>158</sup> for restraint of trade, can be attacked under section 2 for joint monopolization or can be subjected to new definitions of "agreement" as including mere "parallelism" of action. Legislation has been introduced in Congress which would permit dismemberment or

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<sup>153</sup> The relation between the systems and plug compatible markets also makes it difficult to label IBM's acts, particularly the fixed-term plan, as predatory because they were aimed at PCM's. The district court found that FTP was undertaken in response to systems competitors as well as PCM's. The systems market was competitive during the period under review. And yet, IBM's prices in this competitive market will inevitably carry over into the plug compatible markets. The irony is that the PCM's must in large part depend on the systems pricing of IBM for their very existence, but are "injured" by this pricing to the extent that it undercuts their prices or reduces their profits in the plug compatible markets.

<sup>154</sup> 345 U.S. 594 (1953).

<sup>155</sup> *Id.* at 626-27.

<sup>156</sup> Posner, *Oligopoly and the Antitrust Laws: A Suggested Approach*, 21 STAN. L. REV. 1562 (1969).

<sup>157</sup> Turner, *The Definition of Agreement Under the Sherman Act: Conscious Parallelism and Refusals to Deal*, 75 HARV. L. REV. 655 (1962).

<sup>158</sup> 15 U.S.C. § 1 (1970).

regulation of firms in industries with prescribed concentration ratios.<sup>159</sup>

It is far from a universal belief that a positive correlation exists between concentration and monopoly power, or even between concentration and enduring high profits.<sup>160</sup> But it does seem clear that all oligopolistic industries exhibit interdependent decisionmaking which may produce an absence of competition, especially in pricing. Even in *Telex*, which involved an extremely competitive industry, the record discloses that Mr. Finnell of IBM reported to the management review committee in January 1971, with regard to the 2319B and 3420 pricing policies:

[R]eaction to our recent tape and disk pricing action . . . were [sic] as expected or lower. We are continuing to update our 1971 forecasts—raises the question of are you really ahead or are you back to where you started before you adjusted your own prices.<sup>161</sup>

It is this kind of statement, and not the drastically competitive actions engaged in by IBM, which should alarm courts, economists, and consumers. Fortunately, IBM declined Mr. Finnell's invitation to refrain from price competition. It has been persuasively suggested, however, that in concentrated manufacturing industries similar invitations are accepted. Large firms live uneasily under the watchful eyes of both the antitrust authorities and the general public lest their market shares continue to increase. It therefore seems reasonable to draw the inference that such firms might deliberately refrain from actions, particularly in pricing, which risk increase of their market shares and, instead, take out whatever efficiency advantages they may possess in the form of increased short-term profit.

Relaxation of present monopolization restraints on single firm power achieved by internal growth, beginning with an immediate move away from strict adherence to market shares and toward the *General Dynamics* form of analysis, might well aid in the restoration of dynamic price competition in concentrated industries. Assuming that they are not discouraged from actively

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<sup>159</sup> Industrial Reorganization Act, S. 3832, 92d Cong., 2d Sess. (1972).

<sup>160</sup> Demsetz, *Two Systems of Belief About Monopoly*, in *INDUSTRIAL CONCENTRATION: THE NEW LEARNING* (Goldschmid, Mann, Weston ed. 1974); Brozen, *Bain's Concentration and Rates of Return Revisited*, 14 *J. LAW & ECON.* 351 (1971).

<sup>161</sup> 367 F. Supp. at 296.

studying competitors, firms in such industries would then have incentive to move immediately against competitors who because of higher costs or other reasons are vulnerable to competitive marketing techniques. Although interdependent decisionmaking is supposedly permeated by the realization that a competitor's response can wipe out a temporary advantage obtained by a lower price, it is likely that perceived near-term advantages, such as those which would accrue to General Motors if it forced Chrysler to the brink, would produce recurring price competition. Another advantage of relaxing monopolization restraints would be easier detection of horizontal collusion in oligopolistic industries because injuring one's competitors would no longer be proscribed.

The classic argument for the imposition of monopolization liability in the absence of collusion, merger, or unusually predatory conduct is that once the potential monopolist had used its advantage to drive competitors from the market, it would raise prices and restrict output. Even if this prediction were valid, the new "monopolist" would presumably have only a temporary advantage in the absence of governmental entry barriers and that advantage must be weighed against the substantial savings which may be realized by consumers on the road to such "monopolization."

Any monopoly advantage should be quickly overcome. In the General Motors example, Chrysler might be forced, and thus able, to respond with methods of lowering its costs and directing its efforts to more profitable specialties, perhaps with the aid of partners. Even if forced to exit from the industry, its plants could be purchased by Ford, American Motors, a foreign competitor, or by a firm with supply substitutability and proven ability to attract financing, such as International Harvester or Deere & Co.

The extent to which the turn-of-the-century monopolists in fact possessed anything but a very temporary monopoly power, and the role of antitrust actions in diminishing such power, has been heavily discounted over the past two decades.<sup>162</sup> *Alcoa* is perhaps the leading monopolization case, and it probably comes

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<sup>162</sup> See, e.g., G. KOLKO, *supra* note 135; McGee, *Predatory Price Cutting: The Standard Oil (N.J.) Case*, 1 J. LAW & ECON. 137 (1958). See generally A. KAPLAN, *BIG ENTERPRISE IN A COMPETITIVE SYSTEM* (1954).

closest of all leading section 2 cases to finding maintenance of monopoly power without conduct independently violative of other antitrust laws or at least clearly predatory. Like the district court's holding in *Telex*, however, *Alcoa* may well be based on an erroneous definition of the relevant market. Non-aluminum products were excluded, despite studies demonstrating that aluminum has always faced competition from various other materials for all of its many uses.<sup>163</sup> There is no major use for aluminum which cannot be, and has not been, filled by other products. Also, *Alcoa* probably erred in excluding the effects of secondary aluminum ingot competition<sup>164</sup> and in minimizing the effects of foreign competition. For years after the *Alcoa* decision, only two other major entrants appeared in the aluminum industry, and both were thrust into their positions by solely governmental acts: The creation of inflated wartime demand satisfied by new government plants, which were then sold after World War II to create the new entrants in an industry chronically plagued in the post-War period by excess capacity. One can only speculate on the benefits which would have resulted had the capital absorbed by this government financing been allowed to flow to potential competitors in industries with high profits or poor products.

#### CONCLUSION

The district court in *Telex* erred in holding IBM liable for monopolization and attempted monopolization. It relied heavily on market share statistics rather than balancing those statistics against other competitive factors in the industry. Moreover, the accuracy of the district court's market share findings is open to substantial question. It is also possible that some of the markets were erroneously defined, particularly because third and fourth generation products were not considered separately, although more information is needed before a definite conclusion can be reached on this point.

The Tenth Circuit overruled the district court's market divisions and defined a new market unwisely founded on the market

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<sup>163</sup> A. KAPLAN *supra* note 162, at 95-99.

<sup>164</sup> 2 S. WHITNEY, ANTITRUST POLICIES: AMERICAN EXPERIENCE IN TWENTY INDUSTRIES 90 (1958). Inclusion of secondary aluminum alone, with no other changes in the court's market definition, would have reduced Alcoa's market share to 64 percent.

definition concept of supply substitutability. It missed the chance to point out the errors in the district court's market share statistics and, more importantly, to forthrightly balance competitive industry factors against the market share statistics. Finally, the Tenth Circuit acted contrary to precedent and economic theory by holding that an act of monopolization could not consist of ordinary marketing methods available to other competitors. Like the supply substitutability concept, however, the fact that IBM relied only on such methods is important in the initial determination of the existence of monopoly power.

*General Dynamics* indicates a willingness by the Supreme Court to examine all relevant data in taking a dynamic, rather than static, view of an industry in merger cases, and it is suggested that the same procedure be followed in monopolization cases. It is also predicted that such an approach in single firm monopolization cases, where the defendant's conduct has not otherwise violated the antitrust laws, will result in few if any judgments of liability. In attempted monopolization cases, proof of specific intent and causation should be based on acts which are beyond the pale of normal competitive conduct and clearly result in a dangerous probability of monopoly power. This might be shown by high and increasing market shares and an absence of entry opportunities for other firms.

In a developed economy, a growing major industry will attract entrants and competition.<sup>165</sup> IBM has successfully, but with declining market shares, competed with RCA, General Electric, and other major corporations in the computer industry. It has been unable to stop the growth of PCM's and has been able to slow their growth only by continually introducing superior products and by lowering prices. The period from 1969 to 1972 in the computer industry demonstrated what can happen when a firm believes it has competitive freedom of action: Competition and consumers are benefited; some competitors are not.

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<sup>165</sup> See generally F. HAYEK, *THE ROAD TO SERFDOM* 43-47 (1944).