A Broad Market Approach to Antitrust Product Market Definition in Innovative Industries

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Detecting market power is crucial to antitrust enforcement, and agencies discern market power by examining concentration in a defined market. This Note argues that the current restrictive approach to market definition leads to overenforcement because agencies fail to account for the full range of restraints on market power. This problem can lead to particularly skewed market definitions in the context of innovation and cooperation among multiproduct firms. Innovation creates uncertainties about market structure and the course of development. Multi-product firms use innovative technologies as part of a larger mix of products, many of which are commoditized and interchangeable. A broader market definition approach would alleviate the problem of overenforcement by including the spectrum of partial substitutes and emerging replacements that the "smallest market" approach can ignore.

An example of this definition problem arose with the joint venture between International Business Machines Corporation ("IBM") and Apple Computer Corporation ("Apple") to produce a new type of computer software. Announced in the summer of 1991, this joint venture, called Taligent, and four others between IBM and Apple collectively signalled a dramatic realignment of forces in the computer industry.¹ Taligent eventually received Federal Trade Commission (FTC) approval, but only after an investigation lasting several months.²

Although Taligent survived its antitrust examination, similar ventures in the high-technology sector might well fail the tests of market concentration under the current guidelines for reviewing business combinations.³ The basic problem with the current Merger Guidelines is their method of defining the relevant product market. The current process is biased toward unjustifiably narrow market definitions because it requires the enforcing agency to begin its investigation by choosing the smallest market in which the firms' products com-

1. Of the other ventures between IBM and Apple, only one, Kaleida, has progressed significantly. Kaleida will produce multimedia computer software. Andrew Gore, *The Grand Alliance: Apple, IBM Still Laying Foundation for Future*, MACWEEK, July 13, 1992, at 59.

2. The FTC approved Taligent on January 13, 1992. 358 FTC: WATCH (Jan. 13, 1992), available in LEXIS, Trade Library, FTC: Watch file [hereinafter FTC Approval].

3. DEPARTMENT OF JUSTICE AND FEDERAL TRADE COMMISSION, HORIZONTAL MERGER GUIDELINES (1992), reprinted in 4 Trade Reg. Rep. (CCH) ¶ 13,104 [hereinafter MERGER GUIDELINES].

pete. If the concentration (as defined by Herfindahl-Hirschman Indices⁴ ("HHI's")) in this market rises above an arbitrarily defined level, the enforcing agency is likely to block the combination or order divestiture by one of the firms to preserve competition. Because the thresholds for expanding the relevant product market are too high, the calculation exaggerates the concentration in the market, and therefore overstates the combining firms' ability to raise prices above cost.

A "broad market" approach to defining the initial relevant product market would remove some of the enforcing agency's discretion to make overly narrow market definitions by forcing the agency to consider the entire industry, especially competing products that the restrictive "smallest market" test might disregard. The agencies' current approach incorporates some of the elements of such a "broad market" approach, but does so without clear standards to guide businesses and without safeguards against a return to politicized antitrust enforcement.

Part I of this Note sketches the history of antitrust enforcement and market definition up through the present and examines recent (and some pending) reform efforts. Part II suggests a new "broad market" approach to market definition and points out the benefits of this clearer standard in reduced fear of arbitrary enforcement. Part III analyzes the IBM-Apple joint venture and the structure of the markets in which it will compete. In so doing, Part III illustrates the problems with the current market definition approach.

I. ANTITRUST HISTORY AND REFORM

A. *History of Antitrust and Market Definition*

Throughout the 1980's, the Reagan Justice Department rarely challenged mergers, joint ventures, and joint licensing agreements on antitrust grounds.⁵ In the context of the last century of antitrust enforcement, however, the past decade stands out as a brief calm amidst regulatory storms that have swept the industrial landscape since the enactment of the Sherman Antitrust Act in 1890.⁶ Since its inception, the Sherman Act has been a political tool, allowing early trust-busting legislators to attack large industrial conglomerates guilty of

4. The Herfindahl-Hirschman Index (HHI) is a measure for industry concentration showing the sum of the squares of the market shares for firms in the industry. Thus, a perfect monopoly would show an HHI of 10,000 (i.e., 100 times 100). The Department of Justice (DOJ) and the FTC will likely challenge combinations in a market with an HHI above 1800. MERGER GUIDELINES, *supra* note 3, § 1.51(c). These measures are still prey to errors in calculating shares and, most importantly, in defining the relevant product market.

5. See Charles E. Mueller, *How Antitrust Fell as Economics Rose: 'Mutiny' at Justice and the FTC*, 22 ANTITRUST L. & ECON. REV. 1 (1990); Robert Pitofsky, *New Definitions of Relevant Market and the Assault on Antitrust*, 90 COLUM. L. REV. 1805, 1809 (1990).

6. 15 U.S.C. §§ 1-7 (1988).

restraining competition.⁷ During the New Deal, the government frequently bypassed the antitrust laws in coordinating industry through the “codes of fair competition” under the National Recovery Administration.⁸ In the heyday of antitrust enforcement during the 1960’s, the Government successfully enjoined several mergers involving firms controlling less than 10% of the market.⁹ In the waning days of the Johnson Administration, the Department of Justice brought a monopolization suit against IBM based on unrealistically narrow product market definitions, though the case was ultimately dropped.¹⁰

B. *The New Antitrust Boom*

Following the IBM case, in 1982 and 1984, the Antitrust Division and the FTC revised their stated merger policies on the eve of a large merger boom. Today, as a result of a confluence of factors, including reaction to that period of high merger activity and bitterness over the current recession, calls for more vigilant and severe antitrust enforcement have increased. The Supreme Court’s recent decision in *Eastman Kodak Co. v. Image Technical Services, Inc.*, though not a merger case, appears to encourage this trend.¹¹ In the 1990’s, the Justice Department’s Antitrust Division and, especially, the FTC have already increased enforcement efforts,¹² and their actions have inspired private plaintiffs as well.¹³ Much of the renewed enforcement activity has focused on the computer industry, with FTC investigations of the IBM/Apple joint ventures, the Open Software Foundation (a standard-setting group), Intel Corporation (the largest microprocessor manufacturer), and Microsoft Corporation (the largest producer of operating systems software). Private complainants—Advanced Micro Devices

7. These attacks resulted in civil enforcement actions by the Justice Department that dismantled the railway oligopoly (*Northern Sec. Co. v. United States*, 193 U.S. 197 (1904)), the oil trust (*Standard Oil Co. v. United States*, 221 U.S. 1 (1911)), and attempted to unseat U.S. Steel from its dominant position in the steel industry (*United States v. United States Steel Corp.*, 251 U.S. 417 (1920)).

8. The National Recovery Administration grew out of the National Industrial Recovery Act, H.R. 5755, 73d Cong., 1st Sess., 48 Stat. 195 (1933), which the Supreme Court declared unconstitutional in *Schechter Poultry Corp. v. United States*, 295 U.S. 495 (1935).

9. See, e.g., *United States v. Von’s Grocery Co.*, 384 U.S. 270 (1966); *Brown Shoe Co. v. United States*, 370 U.S. 294 (1962).

10. FRANKLIN FISHER ET AL., *FOLDED, SPINDLED AND MUTILATED: ECONOMIC ANALYSIS AND U.S. v. IBM* 60-63 (1983).

11. 112 S. Ct. 2072 (1992). The Court dismissed Kodak’s claim for summary judgment in a suit in which independent servicers of Kodak equipment charged Kodak with an illegal tying arrangement. Concerned with this decision and the rise in the FTC’s enforcement activism, one commentator described these events as “an ominous and surprising sign that the antitrust reforms of the 1980s and the economic benefits they wrought are under serious attack.” Charles F. Rule, *Back to the Dark Ages of Antitrust*, WALL ST. J., June 17, 1992, at A17.

12. Interview: Professor Eleanor M. Fox, ANTITRUST, Fall/Winter 1991, at 8; Robert Pitofsky, *The Renaissance of Antitrust*, 45 REC. ASSOC. B. CITY N.Y. 851, 853 (1990) (“Now—abruptly—the situation has changed. . . . [Antitrust] cases are being filed and investigations initiated into areas of business behavior that were immune during the Reagan years.”); Andrew Pollack, *Antitrust Actions on the Rise Again*, N.Y. TIMES, Nov. 10, 1991, § 3, at 8 (“[O]ne reason for the resurgence of antitrust investigations is simply that Federal regulators are becoming more aggressive in general after eight years of little enforcement. . . .”).

13. See, e.g., Pollack, *supra* note 12, at 8.

(AMD), Cyrix Corporation, and Addamax Corporation—have piggy-backed on the resulting FTC complaints, while Hewlett-Packard and Tandy have launched suits of their own.¹⁴

This renewed enforcement activity emphasizes concentration and market definition, hearkening back to the rigid enforcement of the 1960's and 1970's.¹⁵ Businesses' present fear of an active enforcement climate, based on memories of that era, is especially acute in high-technology industries because companies in those industries depend on both innovation and a complex interplay between firms to exploit those innovations. First, high-technology industries compete and survive on their ability to innovate. Innovation creates new products which, by definition, may reorient the industry's focus and alter the terms of competition.¹⁶ But the very novelty of these products can create antitrust problems in a vigorous enforcement climate, since the product may initially appear to present a wholly separate and, therefore, highly concentrated market.¹⁷ Second, the growing size and complexity of high-technology innovation demands correspondingly large and complex research and development efforts which are often beyond the resources of a single firm. Small start-up companies may have more ideas than money, and even large, vertically-integrated firms, like IBM and Apple, cannot move alone in all the promising directions their individual research may lead. These trends have produced an explosion of high-technology joint ventures and outright acquisitions¹⁸ that, due to *apparent* concentration, has incited a barrage of antitrust investigations.

C. Legislative and Administrative Reform Efforts

Citing the potentially stifling effect of such investigations, let alone prosecutions, on joint research and development, many legislators have voiced alarm

14. *Id.* AMD and Cyrix have sued Intel for monopolizing the microprocessor industry. Addamax's suit is against the Open Software Foundation, charging it with acting as a buying cartel. Hewlett-Packard's suit charges Apple with attempted monopolization of the screen-display software market. Tandy's suit against Texas Instruments alleges various anti-competitive selling arrangements.

15. Robert B. Bell & John A. Herfort, *Justice, FTC Signal Tougher Merger Enforcement Standards*, ANTITRUST, Summer 1990, at 5.

16. For example, the personal computer (PC) introduced by Apple in the late 1970's remade the image of computers for millions. Brenton R. Schendler, *The Future of the PC*, FORTUNE, Aug. 26, 1991, at 40.

17. Thomas M. Jorde & David J. Teece, *Introduction*, ANTITRUST, INNOVATION, AND COMPETITIVENESS 8 (Thomas M. Jorde & David J. Teece eds., 1992) ("Too literal an application of the DOJ's 5% test would suggest that each manufacturer is in a different market. . ."). The recent Supreme Court decision in *Eastman Kodak Co. v. Image Technical Services, Inc.* 112 S. Ct. 2072 (1992) has lent credence to this fear. The Court declared that "Kodak . . . contends that, as a matter of law, a single brand of a product or service can never be a relevant market under the Sherman Act. We disagree. . . . This Court's prior cases support the proposition that in some instances one brand of a product can constitute a separate market." *Id.* at 2090.

18. In addition to the IBM-Apple ventures, IBM has also entered into ventures with chip maker Motorola Corporation. Dierdre Depke & Kathy Rebello, *IBM-Apple Could Be Fearsome*, BUSINESSWEEK, Oct. 7, 1991, at 28. Microsoft is now working with Digital Equipment Corporation. Borland Corporation has acquired Ashton-Tate. James Daly, *Borland, Ashton-Tate are One*, COMPUTERWORLD, Oct. 21, 1991, at 18.

at the prospect that American antitrust authorities might damage efficient domestic research ventures, further injuring American efforts to compete with the Japanese and other foreign state-aided high-technology manufacturers.¹⁹ In 1984 Congress passed the National Cooperative Research Act (NCRA),²⁰ which mandated a rule of reason approach²¹ to joint research and development activities and limited damages in actions complaining of such activities to exclude treble recovery. While the NCRA protected companies pooling their research efforts, because it excluded production ventures from the coverage of the Act, it failed to insulate the commercialization of the fruits of those ventures.²² To close this gap, the Senate has recently passed a bill to extend the protections of the NCRA to production ventures as well.²³ Though the House is currently considering a similar bill, its passage remains uncertain. But while the Senate bill sends a signal to enforcement authorities, to prospective private plaintiffs, and to the courts, it does not address the problem of market definition in high-technology industries.²⁴

II. THE BROAD MARKET APPROACH

The first section of this Part will discuss the "broad market" alternative to the guidelines' "smallest market" approach and will demonstrate that the benefits offered by greater appreciation of competition from other products, both actual and future, outweigh the bias against enforcement. The second section of this Part will outline the administrative and competitive benefits of the clarity a broad market approach would bring.

19. See Charles H. Ferguson, *Computers and the Coming of the U.S. Keiretsu*, HARV. BUS. REV., July-Aug. 1990, at 55 (proposing grand alliance of many U.S. and European high-technology companies to compete with Japanese).

20. 15 U.S.C. §§ 4301-4305 (1988).

21. This contrasts with the per se illegality approach applied to combined activities between direct competitors. The per se approach defines certain activities, such as pricefixing, as illegal despite any justifications the defendant might raise. The rule of reason demands a case-by-case analysis of whether the pro-competitive benefits of the combination, such as claimed efficiencies, outweigh its anti-competitive effects. The Supreme Court extended rule of reason analysis to joint ventures in *Broadcast Music, Inc. v. CBS*, 441 U.S. 1, 24 (1979).

22. 15 U.S.C. § 4301(b)(2).

23. National Cooperative Research Act Extension, S. 479, 102d Cong., 1st Sess. (1991); see *Senate Passes Antitrust Bill to Provide Some Relief for Joint Production Ventures*, 62 Antitrust & Trade Reg. Rep. (BNA) No. 1555, at 277 (Mar. 5, 1992). The enactment of this bill is, however, by no means guaranteed. Several prominent figures oppose it, including Senator Metzenbaum, Chairman of the Antitrust Subcommittee, and economist Michael Porter; see *Interview with Professor Michael E. Porter*, ANTITRUST, Spring 1991, at 5, 6.

24. Even under the proposed amendment to the NCRA, the FTC might find monopolization when two firms join forces to exploit a new technology which performs a standard function at a qualitatively superior level. Under the "broadest market" test, *infra* Part II, the FTC would be forced to consider qualitatively different, incompatible, or inferior technologies which could partially substitute for the two firms' product. Such consideration would likely redefine the market so as to diminish concentration below the enforcement range.

Although the Justice Department recently revised the Merger Guidelines, the revision fails to remedy crucial problems in the section on market definition.²⁵ While the new guidelines "provide a 'framework' for 'a more detailed analysis of [market] entry and . . . competitive effects,'"²⁶ they do nothing to resolve the problem of market definition in innovative industries. This lack of clarity presented few problems while the relaxed enforcement policy of the Reagan administration was in effect, but unclear enforcement standards combined with more aggressive regulatory agencies could chill the growth and cooperation of high-technology firms at the very moment those firms should be leading the country into higher growth and competition with foreign, state-assisted conglomerates. Despite some recent strengthening of the Japanese antitrust laws, Japanese companies combine their energies virtually unopposed in huge conglomerates (*keiretsu*) which cooperate with each other and own large percentages of each other as well.²⁷

Rather than making businesses rely on the NCRA, which, even if extended, would offer insufficient protections against increased antitrust enforcement, the enforcing agencies should adopt a new approach to market definition in the context of innovation. Such an approach reverses the "smallest market" test that produces inconsistent results.²⁸ The new "broadest market" approach would compel enforcing agencies to look at the industry as a whole and to factor in the many competing products, ideas, and axes of development which the more restrictive smallest market test would leave out unless they rose to the prescribed levels.²⁹

While this approach would inject a bias against enforcement, such a bias is justified in light of the special situation of high-technology innovation.³⁰ First, high-technology industries, and particularly the computer industry, undergo rapid shifts in market structure with huge companies like Apple, Microsoft, Sun, and Compaq emerging to dominance—sometimes fleetingly—in the space of a few years. Because product development begins years before the commercialization that would allow enforcing agencies to test claims of market power empirically, market definitions remain elusive. Second, domestic market power is often of little significance since there are virtually no geographic

25. MERGER GUIDELINES, *supra* note 3, § 1.11. The key language outlining the smallest market test is functionally identical to language in the 1984 Merger Guidelines.

26. James Rill, Assistant Attorney General, Antitrust Division, *quoted in* Joe Davidson, *Merger Guidelines are Being Revised by Justice Agency*, WALL ST. J., Mar. 20, 1992, at B4.

27. Ferguson, *supra* note 19.

28. See Figure 1, *infra* Part III(D) and accompanying text.

29. Under current standards, unless a competing product would cause a firm to lose market share if it tried to raise its price 5%, or a competitor could bring added capacity to bear within two years of such a 5% price increase, those competing products and competitive capacity will not figure into market definition. MERGER GUIDELINES, *supra* note 3, § 1.11. This produces an inaccurate measure because it ignores restraints on market power that should demonstrate lower concentration.

30. William F. Baxter, *Antitrust Law and Technological Innovation*, ISSUES IN SCI. & TECH., Winter 1985, at 80, 87 ("[U]ncertainties about the seriousness of collusion risks regarding the market for R&D and the market for tomorrow's products should be resolved in favor of permissiveness.").

barriers. Technology, especially software, costs little to transport and faces few tariff restrictions. Because of the limited number of types of hardware platforms, international standards for software use allow producers free technical access to world markets. Third, barriers to entry, particularly in software, are low because most of the investment is in human capital. Finally, and most importantly, American high-technology firms face a threat from Asian companies which receive not only antitrust immunity in their home countries, but active government support.³¹ Therefore, the dangers from nonenforcement seem less significant compared with the possible damage from too narrowly defining markets for developing high-technology products.³²

A. *The Broad Market Test*

To resolve the dilemma of the "smallest market" approach, the enforcement agencies should take a broad view of the entire industry in which the partners in a business combination operate. The broad market test involves three steps:

1. Examine the entire industry in which the combining firms operate (rather than trying to isolate individual products).³³
2. Consider the whole spectrum of partial substitutes to the firms' product(s) and the range of potential competitors, both foreign and domestic, who could enter the market however long it might take (rather than applying the 5%/two-year hurdle tests).³⁴
3. Tally the firms' share of resulting market concentration considering the interaction of products at the time—perhaps years in the future—when the firms' product eventually enters the market.³⁵

31. The Court noted the extent to which Japan's Ministry of International Trade and Industry (MITI) aids Japanese companies in *Matsushita Elec. Indus. Co. v. Zenith Radio Corp.*, 475 U.S. 574, 580-84 (1986). See also Ferguson, *supra* note 19, at 58-59 (illustrating development of Japanese high-technology conglomerates).

32. FISHER, ET AL., *supra* note 10, at 43-46. See generally ROBERT BORK, *THE ANTITRUST PARADOX: A POLICY AT WAR WITH ITSELF* 217-24 (1978) (arguing against rigid antitrust enforcement).

33. In this case, the "entire industry" includes all the producers of all software and machines that perform data processing functions. This includes not only operating systems manufacturers, but makers of PC's, workstations, and mainframes as well.

34. Unfortunately, the 1992 Merger Guidelines *deemphasize* the impact of supply substitution on market definition by focusing solely on demand substitution factors in the market definition section. MERGER GUIDELINES, *supra* note 3, § 1.0.

35. This is a more demanding calculation than enforcement agencies now administer, but it makes explicit those agencies' implicit demand that buyers calculate their own guesses about consumption preferences in a future market. Whereas the present guidelines leave it up to the buyer to decide whether to factor the effect of innovation on market structure, the broad market approach makes the effect on market structure a primary question for the *agency*.

If, after applying this test, the firms' share of the market (as opposed to the market as a whole) remains in the "highly concentrated" range,³⁶ only then should the agency consider blocking the combination.

In the textbook world of static industries and one-product firms, concern about market definition seems out of place. But in the real world of diversified companies and complimentary product lines, the smallest market approach strictly applied could lead to the wrong enforcement decision by ignoring the industrial context of a combination.³⁷ A "broadest market" approach not only more accurately reflects the realities of competition between innovating firms, but also more closely approximates the way enforcement authorities often actually approach problems of complex business combinations.

Under this broad approach, the FTC would analyze the IBM-Apple joint ventures in the context of the computer industry as a whole, considering all functional substitutes to Taligent's product even though those substitutes might not be directly interchangeable. It is important to view the whole industry because on the consumer side (1) products may develop along different axes, demanding investment in different sets of auxiliary hardware and software,³⁸ and (2) as technology develops, products may functionally overlap each other, diluting any one product's hold on the market.³⁹ On the producer side, potential sources of competition may not recognize and realign their own manufacturing to compete with the combination within a short time period. Because technologies emerge along separate axes of development, potentially competing firms may not compete directly until a successful standard emerges to compete

36. The Merger Guidelines define a market with a post-merger HHI above 1800 as "highly concentrated." MERGER GUIDELINES, *supra* note 3, § 1.51(c). See also Figure 1, *infra* Part III(D) (outlining enforcement range).

37. Thomas M. Jorde & David J. Teece, Product Market Definition in the Context of Innovation: An Exploration, University of California Business & Public Policy Working Paper No. BPP-29, 2 (1988) (unpublished manuscript, on file with author) ("The standard approaches will almost always lead to market definitions which are too narrow and, hence, too exaggerated for conceptions of market power and antitrust concerns.").

38. Ian Ayres, Note, *Rationalizing Antitrust Cluster Markets*, 95 YALE L.J. 109, 115 & n.33 (1985). While proponents of stricter enforcement point to the "switching costs" as the basis for possible market power, see MERGER GUIDELINES, *supra* note 3, § 1.11, question (4), this concern ignores larger business realities. Multiproduct firms are repeat players selling integrated systems. Any attempt to leverage market power in one part of the package will not only fail by cutting into profits on other parts but will engender considerable ill will among consumers. In his dissent in *Kodak*, Justice Scalia countered the majority's assertion that such "switching costs" led to undue market power, noting that "this 'circumstantial' leverage created by consumer investment regularly crops up in smoothly functioning, even perfectly competitive, markets, and in most—if not all—of its manifestations, it is of no concern to the antitrust laws." 112 S. Ct. 2072, 2098 (1992). These considerations may explain why Apple and IBM have been working toward greater *interoperability* between computer systems, both in the Taligent venture and through the Open Software Foundation. G. Pascal Zachary, *Apple Moves the Microsoft Battle to the Marketplace*, WALL ST. J., Apr. 16, 1992, at B4.

39. For example, as microprocessors become more powerful, as with reduced instruction set chip (RISC) development, they can perform more of the control functions typically associated with OS's. Similarly, the boundary between OS and applications programs has become less distinct with the introduction of the Windows and Hewlett-Packard graphical user interfaces. Another example is the growing competition between PC's and workstations. As high-technology products develop, they compete more on the basis of function than of format.

against. For example, Microsoft will likely invest in producing an object-oriented operating system (OS) if Taligent's proves highly profitable, although Microsoft might not be able to bring such a product to market within two years.⁴⁰

The HHI can deceive analysts with its false air of precision and, in the hands of overzealous enforcement authorities, can stifle competition by overestimating the market power of the cooperating or combining parties.⁴¹ As noted in Part III, the essential problem with the HHI or any quantitative measure of market concentration is that definition of the market remains up to the index's user.⁴² Although the Merger Guidelines themselves⁴³ and many scholars⁴⁴ have warned of the dangers of too great a reliance on HHI, the tempting clarity of the Herfindahl index focuses the attention of opponents of combinations more forcefully than arguments about pro-competitive efficiencies and potential competition.

In Taligent's case, it is easy to fixate on the large size of IBM's and Apple's investment in the venture, the large share of the object-oriented OS market (narrowly defined) it will probably capture, and the size of IBM and Apple as computer hardware manufacturers. Harder to take into account are the shifting structure of the computer business as a whole, including software and hardware advances, the rising importance of applications and database services, and the threat of foreign high-technology competition. Taking all these factors into account prevents enforcement authorities from pegging the initial relevant product market at a peak in concentration, a peak from which the smallest market test will not allow the index to decline. For example, if the FTC chose the market for all Operating Systems software as the initial relevant product market, it would find concentration in the likely enforcement range. This concentration arises not from IBM and Apple, but from Microsoft's dominant share. This is true despite the fact that a narrower market definition, the present market for true object-oriented OS's, is completely unconcentrated because it does not currently exist except as a prospect beyond the guidelines' two-year boundary. Similarly, if the FTC chose the market for all PC's and their associated software, it would find concentration in the possible enforcement range,

40. Interviews with Edward T. Keegan, Jr., Director of Development and Operations, and H. Morrow Long, Manager of Development, Yale University Department of Computer Science, in New Haven, Conn. (Oct. 22 & Dec. 3, 1991) [hereinafter Keegan & Long].

41. Jay Greenfield, *Beyond Herfindahl: Non-Structural Elements of Merger Analysis*, 53 ANTITRUST L.J. 229, 233 (1984) ("[E]ven a small error in calculation of market shares of the leading firms can result in a large difference in the HHI value.").

42. Comments by Douglas Zona, National Economic Research Associates, cited in *ABA Probes Emerging Issues in Analysis of Market Power*, 61 Antitrust & Trade Reg. Rep. (BNA) No. 1538, at 495, 499 (Oct. 24, 1991).

43. MERGER GUIDELINES, *supra* note 3, § 2.0.

44. Jorde & Teece, ANTITRUST, INNOVATION, AND COMPETITIVENESS, *supra* note 17, at 11; Gregory J. Werden, *Market Delineation and the Justice Department's Merger Guidelines*, 1983 DUKE L.J. 514, 550-51 ("A five percent standard combined with the Guidelines' principle of choosing the smallest market makes it fiercely likely that relevant markets will be delineated too narrowly.").

despite the fact that a narrower definition, i.e., for all software, would render lower HHI's.

Proponents of the present guideline structure might point to the relative leniency and rationality with which the FTC and Antitrust Division have applied the smallest market test. After all, one might argue, Taligent eventually passed antitrust scrutiny. Such an argument ignores the problems this Note raises about the present guidelines. First, to the extent the guidelines are applied, they confuse both the enforcers, who may produce irrational concentration data, and combining businesses, which do not know what activities will prompt enforcement action. As Section B will show, such confusion will cause efficiency losses. Second, as the enforcement authorities' willingness to prosecute a growing number of cases increases, the damage from the guidelines' uncertainty will mount. To add to this uncertainty, joint production ventures, even when approved at the first stage, might still meet another antitrust challenge once the product goes into commercialization.

B. The Benefits of Clarity and the Fear of Antitrust

The current guidelines produce a vague standard biased toward enforcement, a bias tempered only by the enforcing agencies' competence, neutrality, and disinterest. The choice between clear and vague standards necessarily involves striking a balance between the benefits of certainty and administrative flexibility. A vague standard allows administrators to tailor their regulatory efforts to the facts of a particular case, while clear standards bind administrators' flexibility in order to give the businesses subject to regulation adequate warning about proscribed activities. In the case of antitrust enforcement in the context of innovation, the balance has swung too far toward flexibility, leaving American companies without a clearly defined framework to determine which cooperative arrangements will avoid expensive and time-consuming antitrust scrutiny, let alone prosecution.

As an example, even the Taligent venture's passage demanded a "second request" under the Hart-Scott-Rodino Act.⁴⁵ Several other proposed joint ventures have not been as fortunate. During the relatively lenient 1980's, four highly visible proposed joint ventures ran afoul of enforcement authorities and were forced to significantly restructure in order to avoid a ban.⁴⁶ The criticism

45. *Merger Briefs*, 355 FTC: WATCH (Nov. 18, 1992), available in LEXIS, Trade Library, FTC: Watch file [hereinafter *Merger Briefs*]. Under the Hart-Scott-Rodino Antitrust Improvements Act of 1976, 15 U.S.C. § 18a(e) (1988), a "second request" beyond the initial filing information for all qualifying business combinations often demands that the firms furnish confidential information on pricing and output decisions. Telephone interview with John Peterman, Director of the Bureau of Economics, Federal Trade Commission, and Malcolm Coate and Robert Levinson, Federal Trade Commission (Dec. 9, 1991) [hereinafter *FTC Interview*].

46. *United States v. Alcan Aluminium Ltd.*, 49 Fed. Reg. 40,454 (1984) (proposed consent judgment and competitive impact statement); *Socal Inc. and Gulf Corp.*, 49 Fed. Reg. 23,812 (1984) (proposed consent

of one of these ventures, between GM and Toyota, proved so intense that two commissioners of the FTC spoke out publicly against the combination,⁴⁷ and even the majority of commissioners accepted the Bureau of Competition's market definition as small cars rather than all cars or motor vehicles in general.⁴⁸

The enforcement authorities have won several outright victories against combinations involving high-technology and computer-industry firms *since* the 1984 enactment of the NCRA. In 1986, the FTC won an injunction against the merger of two manufacturers of high-technology glass products based on an extremely narrow market definition.⁴⁹ Although the court admitted it could not accurately calculate HHI's in the context of fast-paced innovation, it nonetheless blocked the combination.⁵⁰ In 1991, the Antitrust Division managed to block a merger of computerized betting system manufacturers by relying on an overly narrow product market definition⁵¹ which disregarded potential foreign entrants.⁵² On an encouraging note, however, the Court of Appeals for the D.C. Circuit recently rejected the enforcing agency's overly narrow market definition, observing that even the *threat* of entry can stimulate competition.⁵³

As a result of this lack of clear rules as to which types of combinations will meet with enforcement pressure and which will not, fear of the antitrust process deters businessmen from entering efficient combinations.⁵⁴ While it is impos-

agreement with analysis to aid public comment); General Motors Corp. and Toyota Motor Corp., 49 Fed. Reg. 18,289 (1984) (prohibited trade practices and affirmative corrective actions) [hereinafter GM/Toyota JV]; Texaco Inc. and Gulf Oil Co., 49 Fed. Reg. 8550 (1984) (proposed consent agreement with analysis to aid public comment).

47. "[T]his combination of two powerful and direct competitors cannot be sanctioned under the antitrust laws." Dissenting Statement of Commissioner Patricia P. Bailey, GM/Toyota JV, *supra* note 46, at 18,293. Commissioner Pertschuk also dissented. *Id.* at 18,292.

48. Statement of James C. Miller III, Chairman, Federal Trade Commission, *Id.* at 18,291. The "small cars" definition ignores the functional interchangeability between "small" cars and other types of motor vehicles.

49. *FTC v. PPG Industries, Inc.*, 798 F.2d 1500 (D.C. Cir. 1986). The court approved the FTC's definition of the relevant product market as "high-technology" aircraft transparencies, excluding the many other less complex products the two firms manufactured. *Id.* at 1504.

50. *Id.* at 1505. The district court was "unable to calculate an HHI for the high-technology market since that market is growing rapidly, major portions of it lie in the immediate future, and market shares depend upon both the success of the future bids of the transparency manufacturers and the ultimate size of the projects for which they bid," and the D.C. Circuit agreed with this finding. This logic applies with equal force to Taligent. *See infra* Part III.

51. *United States v. United Tote, Inc.*, 768 F. Supp. 1064, 1069-70 (D. Del. 1991).

52. *Id.* at 1072.

53. *United States v. Baker Hughes Inc.*, 908 F.2d 981, 992 n.13 (D.C. Cir. 1990). Judge (now Justice) Thomas accused the Antitrust Division of slavish adherence to statistics in determining the market when bringing this suit. At the district court level, 731 F. Supp. 3, 8 (D.D.C. 1990), the court accused the Antitrust Division of "artificially shrinking" the relevant product market.

54. "[D]iscouraging any potential joint venture participants from contemplating similar productive efforts [to those of the Japanese] is the shadow cast by our antitrust laws. . . . The impediment . . . is not so much what the law says as what is left cloudy—left to the businessperson's imagination." Remarks of Paul Spillane, American Electronics Association, H.R. REP. NO. 571, 98th Cong., 1st Sess., pt.1, at 10 (1983); *see also* Edward Correia, *Congress and Antitrust Policy After the Reagan Administration*, in *REVITALIZING ANTITRUST IN ITS SECOND CENTURY* 451, 466 (Harry First et al. eds., 1991); Joel B. Eisen,

sible to know how many ventures the guidelines' lack of clarity has deterred or modified, it is clear that in a dynamic and innovative industry, months or even weeks in bringing a product to market can make a competitive difference.⁵⁵ The broadest market approach would make the enforcement agencies' methods more transparent and shift market definition toward consideration of partial substitutes and potential competition, both of which play a greater role in high-technology than in static traditional industries.

III. PRODUCT MARKET DEFINITION

This Part analyzes the possible definitions for the relevant product market for the Apple-IBM joint venture and demonstrates the inconsistencies of the application of the FTC's approach to market definition. It concludes by showing how the broad market approach would eliminate the bias toward over-enforcement against innovative joint ventures such as Taligent.

Before it can address concentration in the market, the enforcement agency must define the relevant market in which firms exercise market power. That definition leads to conclusions about concentration in the relevant market based on HHI's. The Merger Guidelines' premise of market definition relies on concentration steadily decreasing as the market definition expands to include more products. However, because of the special nature of innovation in the multiproduct firm, the expansion of the market definition paradoxically may increase concentration when the market grows to include related products in which the firms may enjoy greater market shares. Thus, when the relevant market expands to include computer hardware, for instance, concentration will increase due to IBM's and Apple's large shares of that industry. This expansion and contraction can produce erratic swings in concentration, revealing the uncertainty that arbitrary enforcement of the Merger Guidelines could produce.

A. *Object-Oriented Operating Systems Software*

To appreciate the importance of the IBM-Apple project to design and manufacture object-oriented operating systems software, one must first understand how modern computers developed and how they work. The key advance in computer science which catapulted the overgrown accounting machines of the 1950's into the modern age came with the invention of an operating system (OS).

Antitrust Reform for Joint Productions Ventures, 30 JURIMETRICS J. 253, 258 (1990); Thomas M. Jorde & David J. Teece, *Innovation, Cooperation and Antitrust: Striking the Right Balance*, 4 HIGH TECH. L.J. 1, 36-37 (1989).

55. See *infra* note 101 and accompanying text. NeXT Computer is trying to exploit this time lag, although its OS is not truly object-oriented. *NeXT Ad Targets Apple-IBM*, MACWEEK, Dec. 3, 1991, at 116.

Operating system software changes a computer from a clump of fancy hardware into an integrated machine that can respond to complex programming instructions. In essence, the central processing unit, a computer's brain, is a collection of microprocessors built out of intricately engraved silicon chips which relay electronic impulses at extremely high speed. Those impulses represent data which enter the microprocessors from a storage component (in PC's, from a magnetic disk drive). Computer operations involve three functions (somewhat arbitrarily defined) which must be fully integrated: program,⁵⁶ memory, and control. As computers have evolved, the part of the computer that produces each function has changed.

Because the earliest machines had simple programs and no OS, they required human intervention at many stages (e.g., inserting and removing cards, changing magnetic tape reels). As programs became more advanced and processors swifter, programmers had to cope with competing demands of users for more sophisticated programming applications and of the burgeoning array of processors for stricter management. Programs eventually became so complex that OS software developed as an intermediate layer between the raw hardware and the program. As such, the OS created a "virtual" machine, a software image of the actual hardware, with which the program software could interact to control the processors and drives without demanding that each programmer write the entire instructions for operating the machine into each program.⁵⁷

While solving the problem of hardware integration, however, the development of operating systems software created the problem of software integration. Although the OS gave programmers a powerful tool for creating applications software, each OS also limited its users to its unique method of substituting short human-readable character strings (the computer language equivalent of words) for complex series of machine-language hardware-control commands. Thenceforth, programs and the programming languages in which they were written had to correspond to a particular OS and would not function on a competing OS.

Whereas familiar OS's such as Microsoft Corporation's MS-DOS or Apple Computer's MacOS generate a *language*-oriented programming environment (using characters to relay and interpret commands from program to hardware), Taligent aims to produce an effective *object*-oriented OS. Computer experts hailed the development of object-oriented systems as "a total departure from

56. Future references to "programs" will denote *applications* programs as distinct from OS programs.

57. The OS arranges information in vast "tables." "[T]hese tables are the representation of objects such as virtual processors, user processes, disk records, memory blocks, pages, segments, files, and catalogs. . . . [E]very table is a binding context mapping names of objects of one type into one or more names of objects of other types. At the bottom of the system, a disk address or memory address does not map into any lower level name but maps into a concrete object, a disk record or memory block." PHILLIPE A. JANSON, OPERATING SYSTEMS: STRUCTURE AND MECHANISMS 240 (1985).

what exists now,"⁵⁸ because such programs could radically shorten programing time while increasing efficiency. The object-oriented system would generate an apparent spatial reality within the CPU (Central Processing Unit) allowing programmers to use objects ("modules" that express programming information three-dimensionally) as building blocks with which to compose a program. These modules, once known as "sub-routines," would retain their informational identities and could be removed and reshaped at the programmer's option to speed the writing of further programs. Applications functioning in an object-oriented environment could respond to computing events without direct communication from the user. With this capability, the OS could assign alternate computing tasks efficiently to its processors (known as "multi-tasking"), thus dramatically increasing overall speed. This capacity may become increasingly important as "massively parallel" computers use huge arrays of microprocessors to multiply computing power in ever-shrinking machines. As another crucial advantage, Taligent's OS will operate on both IBM and Apple formats and should be more easily adaptable to different computer environments.⁵⁹ This interoperability increases the number of programs the OS could run, and hence both its usefulness to consumers and its competitiveness with other software products.

B. *Operating Systems and the Computer Industry*

IBM revolutionized the computer industry in 1980 when it introduced its PC model personal computer. Though not the first self-contained desktop machine, the IBM PC brought the user the convenience of a personal machine coupled with the range of IBM-compatible applications software. To bring the PC to market, however, IBM had to end its policy of producing all its own software and components. By cooperating with Microsoft Corporation and Intel Corporation, IBM gained access to Microsoft's DOS (disk operating system) software and Intel's advanced microprocessor chips. Because IBM was able to use DOS rather than spend time developing its own OS for PC's, this pact allowed IBM a few years' march on the competition. The cost of this head start

58. Keegan and Long, *supra* note 40. Although the NeXT Corporation manufactures an OS which it calls "object oriented," the NeXT OS does not allow true interchangeability of the "objects," and therefore does not compete directly with the projected Taligent product. *Id.*

59. Zachary, *supra* note 38, at B4.

was allowing an explosion of "clones"⁶⁰ to enter the market and devour IBM's once commanding lead in assembled personal computers.⁶¹

In 1984, Apple Computer introduced its Macintosh model, running its own OS and directly challenging IBM and the IBM-compatible, DOS-running clones. While the Macintosh has fared poorly against the IBM-compatible computers in business applications, Apple has managed to carve out 10% of the PC market.⁶² MacOS earned Apple extra revenues but, because of its incompatibility with IBM and other systems, has injured the Macintosh's popularity. While tremendous effort went into developing software for the DOS-system computers during the 1980's, Apple received little attention from software manufacturers until software giant Microsoft leapt into the Macintosh applications market to become the dominant producer.⁶³

The history of the personal computer at IBM and Apple demonstrates the evolution of the computer industry from hardware to software. While the internal architecture of the computer, the "hardware," once determined the computer's salient characteristics, now the software, particularly the operating system, drives the creation of new computers and adds the most value in computer manufacturing.⁶⁴ The proliferation of domestic clones and the proficiency of foreign manufacturers at copying American hardware designs has plunged the computer hardware manufacturing industry into fierce competition.

60. Clones are personal computers which mimic IBM's microprocessor architecture (hardware) and run OS software which also operates on IBM PC's. Clones include the products of Compaq, Dell, AST, ALR, Leading Edge, Maxum, NEC, and many others, as well as the more recent laptop models from Toshiba, Zeos, Sharp and others. Raymond S. Hartman & David J. Teece, *Product Emulation Strategies in the Presence of Reputation Effects and Network Externalities: Some Evidence from the Minicomputer Industry*, 1 ECON. INNOVATION & NEW TECH. 157 (1990) (documenting effectiveness of this competition).

61. While IBM captured a commanding chunk of the "PC market" in 1981, by 1984 a flood of clones began to whittle this share down to the 14-15% share (by some estimates) it can claim today. *IBM-Apple—the InfoCorp View*, COMPUTERGRAM INT'L, Aug. 8, 1991, at CGI08080014; Neal Templin, *PC-Price Dive Drags Down Big Players*, WALL ST. J., Nov. 8, 1991, at B1. Other analysts put IBM's share substantially higher, at 17% (Schendler, *supra* note 16, at 43), 20% (Paul B. Carroll, *How an IBM Attempt to Regain PC Lead Has Slid into Trouble*, WALL ST. J., Dec. 2, 1991, at A1), or even at close to 30% (Carla Lazzareschi, *Rivals IBM, Apple Will Exchange Technologies*, L.A. TIMES, July 4, 1991, at A1). This confusion of share data relates directly to market definition problems and will be discussed at length below.

62. Andrew S. Rappaport & Shmuel Halevi, *The Computerless Computer Company*, HARV. BUS. REV., July-Aug. 1991, at 69, 72; *IBM-Apple—the InfoCorp View*, *supra* note 61, at CGI08080014. Recent price cuts in the low end Macintosh models may have pushed Apple's market share higher in 1991. Templin, *supra* note 61 at B1. Some analysts peg Apple's share at 9%, Schendler, *supra* note 16, at 40 or even as low as 7%, Alan Cane, *IBM Explores PC Frontiers*, FIN. TIMES, July 11, 1991, at 15.

63. G. Pascal Zachary, *Microsoft Vows Aggressive Gains in Market Share*, WALL ST. J., Nov. 15, 1991, at B3; see also *infra* note 108 and accompanying text.

64. Rappaport & Halevi, *supra* note 62, at 70. "IBM realized that the OS was driving the technology and the industry, not the hardware." Dick Schaffer, editor of the *Technologic Computer Letter*, quoted in Kristi Coale, *Redrawing the Map: Will the IBM/Apple Alliance Shift the Balance of Power?*, INFO WORLD, July 22, 1991, at 44.

The competition has left IBM⁶⁵ and Apple⁶⁶ reeling, and Microsoft (which manufactures only software) gloating.⁶⁷

Fearing Microsoft's dominance of the profitable software business, longtime archrivals IBM and Apple found common cause in a series of five joint ventures⁶⁸ aimed to strike back at Microsoft.⁶⁹ The cooperative effort most relevant to this goal, and most promising for reestablishing IBM and Apple as industry leaders, is the Taligent venture to produce an object-oriented OS. Apple contributed to the venture its four-year-old object-oriented research project named "Pink." IBM know-how and resources gave the venture the additional means to outflank Microsoft in supplying OS's for the next generation of PC's.⁷⁰ The Shareholder Agreement forbids IBM and Apple directors to make any decisions as to the pricing or output of Taligent's products,⁷¹ and commits both parents to lend their strategic endorsement to at least one major Taligent product.⁷² Unlike joint ventures geared solely toward research and development, which are popular in the semiconductor industry, Taligent plans to research, to manufacture and to market a new OS product compatible with both Apple and IBM systems.⁷³ Apple and IBM will continue to develop their own hardware platforms for the new OS. Apple President Michael Spindler claimed, "We will create the foundations faster together, and then we will compete ferociously."⁷⁴

These assurances against anticompetitive behavior clearly resulted from concerns about the possibility of FTC rejection of the venture. The sudden

65. IBM sustained serious losses in fiscal 1991 culminating in the announcement in November of a broad restructuring plan to break the company into thirteen autonomous divisions. David Kirkpatrick, *Breaking Up IBM*, FORTUNE, July 27, 1992, at 41.

66. Rappaport and Halevi estimate that Macintosh could have captured a third of the personal computer market had it concentrated on software development. Rappaport and Halevi, *supra* note 62, at 72.

67. Microsoft executive Michael Mapels recently predicted that Microsoft might be able to achieve as much as a 70% share in every major applications category. Zachary, *supra* note 63, at B3.

68. Form 8-K filed by Apple Computer, Inc. with the Securities and Exchange Commission, Oct. 15, 1991 (on file with author). Other joint ventures include: Kalieda, a company to produce multimedia computer systems; a three-way venture between IBM, Apple and Motorola to produce a new "reduced instruction set" microprocessor chip; and numerous cross-licensing agreements intended to facilitate the production of a new PC architecture.

69. Asked whether common distrust of Microsoft brought Apple and IBM together, Apple chief financial officer Joseph Graziano responded, "Absolutely, 100 percent." Evelyn Richards, *Apple Chairman Upbeat on Long-Term IBM Deal*, WASH. POST, Aug. 2, 1991, at D1, D4.

70. For \$5 million apiece, IBM and Apple each acquired 50% of Taligent's shares in separate classes of stock, each with its own three directors. Stock Purchase and Shareholder Agreement, Sept. 30, 1991, among MDCA Corporation, Apple Computer, Inc., and International Business Machines Corporation, §§ 2.01(a)-(b) & 6.02(a) (on file with author). This is a crucial condition since it allays the fear *Penn-Olin* raised of joint ventures used as a tool for price fixing. *United States v. Penn-Olin Chemical Co.*, 378 U.S. 158 (1964). The FTC cited the absence of such ancillary restraints in approving the venture. FTC Approval, *supra* note 2.

71. Stock Purchase & Shareholder Agreement, *supra* note 70, at § 6.15(a) ("All pricing and output quantity decisions will be made by the management of the Company [Taligent] and not by the Board.").

72. *Id.* § 6.14(a).

73. *Id.* § 6.19.

74. Peter H. Lewis, *Not Just Blue Sky: I.B.M. and Apple Have a Product*, N.Y. TIMES, Oct. 20, 1991, § 3, at 8.

alliance of formerly bitter rivals raised obvious concerns about collusion, especially cooperation in setting prices and output. Taligent eventually overcame these concerns because the divided ownership structure appeared to safeguard against such collusion. However, this approval is conditioned on continued adherence to the terms of the partners' agreement regarding independent management of the venture.

C. *FTC Application of the Merger Guidelines*

When word of the approaching agreement between two formerly bitter rivals leaked during the summer of 1991, champions of rigid antitrust enforcement began to demand strict application of the Merger Guidelines. Senator Howard Metzenbaum wrote to the Chairman of the FTC to caution her, "[W]e simply cannot ignore anticompetitive practices and alliances that threaten to diminish or eliminate competition in this important industry and to increase prices to consumers. Therefore I urge the Commission to . . . scrutinize closely the proposed joint venture between IBM Corporation and Apple Computer, Inc. . . ."⁷⁵

Since the two companies fall within the Hart-Scott-Rodino filing requirements,⁷⁶ IBM and Apple submitted a pre-merger notification agreement during the summer of 1991. On October 7, 1991, while the FTC's investigation continued, IBM and Apple signed the agreement, along with several other agreements to cooperate with various aspects of computer design and development. In November, the FTC issued a "second request," a demand for more detailed information on the competitive effects of the joint ventures.⁷⁷

Using its 1982 statement on mergers⁷⁸ as a guide, the FTC examined the Taligent venture's potential restrictions on competition between two large, vertically-integrated⁷⁹ corporations. The FTC assessed Taligent, as it would any venture between such corporations to create a new product or to develop new manufacturing capacity, using the merger rules described below.⁸⁰ The

75. Letter from Senator Howard M. Metzenbaum, Chairman, Senate Subcomm. on Antitrust, Monopolies and Business Rights, to Janet V. Steiger, Chairman, FTC (July 10, 1991) (on file with author). Metzenbaum went on to urge the FTC "to pursue vigorously its current investigation of alleged anti-competitive business practices on the part of both the Microsoft and Intel Corporations. . . ." *Id.*

76. All merging or combining companies with assets totalling \$10 million or more being acquired by a person with total assets of \$100 million or more must file a "Pre-Merger Notification" with both the Antitrust Division of the Department of Justice and the FTC. Hart-Scott-Rodino Antitrust Improvement Act, 15 U.S.C. § 18(a)(2)(A) (1988).

77. *Merger Briefs*, *supra* note 45.

78. FEDERAL TRADE COMMISSION, STATEMENT CONCERNING HORIZONTAL MERGERS (June 14, 1982), reprinted in 4 Trade Reg. Rep. (CCH) ¶ 13,200 [hereinafter 1982 Guidelines].

79. IBM and Apple are vertically integrated because both manufacture many of the parts for their finished products, computer systems, and because both manufacture goods throughout the range of computer products (i.e., hardware components, OS's, and applications programs).

80. *United States v. Penn-Olin Chemical Corp.*, 378 U.S. 158 (1964); Seymour D. Lewis, *Joint Ventures Under the Antitrust Laws*, in 18TH ANNUAL ADVANCED ANTITRUST WORKSHOP, at 273 (PLI Corp. Law & Practice Course Handbook Series No. 594, 1988).

FTC also followed the more specific Merger Guidelines which the Antitrust Division of the Department of Justice promulgated in 1984.⁸¹ According to the 1984 Guidelines, the reviewing agency determines whether concentration in the industry in which the two venturers participate greatly increases through the venture agreement so as to stifle competition. The joint 1992 Guidelines make the same inquiry.

In the course of this inquiry, economists at the FTC analyze the companies, their products, and those products which might compete with the combining firms' products. If necessary, the FTC economists consult with outside experts to decide the boundaries of the industry, that is, the products that compete with one another as against those that do not.⁸² In this analysis, economists ask if the combining firms could profitably raise prices on their product without losing customers to firms making a functionally similar product. These considerations allow the FTC to define the relevant market and, on the basis of that definition, to decide whether the combination has injured competition.

Such analysis obscures several questions. First, it assumes that the FTC can satisfactorily define what the "industry" consists of: what companies and what products to include or exclude. Next, it assumes that from this industry yardstick, essentially a definition of the product market, it can calculate accurate market shares to determine the market's concentration, the degree to which a small number of firms control large shares of that market. Finally, it assumes that such concentration alone may distort competition, although the enforcing agency may make exceptions in cases of proven efficiencies or failing companies.⁸³

In examining the Taligent joint venture, the FTC first sought to define the market in which the venture's parents, IBM and Apple, compete using the Merger Guidelines' "smallest market" policy:

[T]he Agency will begin with each product (*narrowly defined*) produced or sold by each merging firm and ask what would happen if a hypothetical monopolist of that product imposed at least a "small but significant and nontransitory" increase in price. . . . If, in response to the price increase, the reduction in sales of the product would be large enough that a hypothetical monopolist would not find it profitable to impose such an increase in price, then the Agency will add to the product group the product that is the next-best substitute for the merging firm's product. . . . *The Agency generally will consider the relevant product market to be the smallest group of products that satisfies this test.*⁸⁴

81. DEPARTMENT OF JUSTICE MERGER GUIDELINES (June 14, 1984) *reprinted in* 4 Trade Reg. Rep. (CCH) ¶ 13,103 [hereinafter 1984 MERGER GUIDELINES].

82. FTC Interview, *supra* note 45.

83. Tom D. Smith, *Merger Counseling Checklist*, 56 ANTITRUST L.J. 801, 810-11 (1987).

84. MERGER GUIDELINES, *supra* note 3, § 1.11 (emphasis added).

This product market definition introduces several terms, primarily "small but significant and nontransitory," whose meanings may fluctuate. In FTC and Antitrust Division parlance, "small but significant" has come to mean approximately 5%, and "nontransitory" to mean persisting over the course of one year.⁸⁵ The initial price from which a change is hypothesized is defined as "whatever is considered to be the price of the product at the stage of the industry being examined."⁸⁶ The "relevant product" is defined only as a "product[] of . . . the merging firms."⁸⁷ All of these terms not only leave the FTC a great deal of leeway in expanding or contracting the definition of the market, but do so before the formal analysis of concentration or injury to competition begins. In short, under the Merger Guidelines, the enforcing agency must approach the problem of product market definition having already defined the relevant product market.

In examining the combination, the FTC's Bureau of Economics does not adhere rigidly to the language of the guidelines,⁸⁸ but may focus on potential efficiencies rather than narrowly defining the product market.⁸⁹ But the final decision about whether or not to enjoin a combination or pursue it in the courts is likely to stem from political considerations, some of which have little to do with protecting competition. First, political demands for more cases may prompt the FTC to block industrial cooperation even when FTC economists deem such cooperation justified by efficiencies.⁹⁰ Second, the FTC's organizational politics may encourage the lawyers in the Bureau of Competition to pursue cases for which they have little backing from economists.⁹¹ The generality of the

85. The 1992 Guidelines deemphasize the 5% figure, but retain the "small, but significant and non-transitory" language. In light of the agencies' statement that the revisions were "largely technical or stylistic" (quoted in *Justice Department, FTC Issue Unified Federal Guidelines on Horizontal Mergers*, 62 Antitrust & Trade Reg. Rep. (BNA) No. 1559, at 404 (Apr. 2, 1991)), the 5% test is likely to survive in practice. The agencies' implicit assertion that they can administer a less rigid test bears noting. See *supra* notes 33-36 and accompanying text (outlining broad market test). The Antitrust Division maintains that the 5% test is merely a flexible guide, that the actual percentage change applied may be higher or lower depending on the "nature of the industry." The only example given for a greater percentage increase is in the case of a tariff or commission distorting the original price. 1984 Merger Guidelines, *supra* note 81, § 2.11 & n.7. This flexibility in price change percentage constituted the main difference from the 1982 Guidelines, *supra* note 78.

86. 1984 MERGER GUIDELINES, *supra* note 81, § 2.11.

87. *Id.* § 2.11.

88. But see Lloyd Constantine, quoted in *ABA Probes Emerging Issues in Analysis of Market Power*, *supra* note 42, at 495. Concentration indices approximate market power which "is a black hole. Antitrust has become a game of constructing market power detectors . . . and we have become slaves to those detectors, so that we don't even look at the exercise of [power]."

89. Even the economists admit reluctance, however, to approve combinations that involve the only two programs in a given market. FTC Interview, *supra* note 45. This concern returns us to the question: what is the relevant market?

90. Malcolm B. Coate et al., *Bureaucracy and Politics in FTC Merger Challenges*, 33 J.L. & ECON. 463, 470-71 (1990) ("At the margin, political demands for enforcement will increase the bureaucratic supply of mergers challenged. . . . [I]n bringing such pressure, the FTC commissioners respond to politicians' demand for more antitrust cases.").

91. "It is the experience of trying cases, the more the better, not the social payoff from the litigation,

guidelines' terms permit enforcing agencies to choose unjustifiably narrow market definitions in order to boost the market's concentration into the enforcement range. An explicit broadest market test would remove some of this discretion, forcing agencies to consider the full spectrum of competition with a given firm's products.

Though the initial selection and gradual broadening of the product market through the "smallest market" test lend the guidelines a false air of specificity and precision, they give little guidance to the FTC and the Antitrust Division. First, the "smallest market" test demands that the enforcing agency select a "product" as a starting point in defining the relevant product market. From this starting point, the agency will expand that market only so far as to include products which prove sufficiently close substitutes to the merging companies' product.⁹² To be a sufficiently close substitute, and thus be included in the relevant market, the product must be one to which consumers would switch following a 5% price increase on the combining firms' product.

Second, this predictive failure emerges in the Herfindahl-Hirschman concentration indices (HHI's) for the different possible markets which this analysis develops. Rather than show gradually decreasing market power as the definition of the relevant product market expands, analysis of the IBM-Apple venture shows erratic swings of concentration *in both directions*.⁹³ While Taligent presently has no market share since it has no product, once its object-oriented system is developed, it will be the main producer of such software, giving it a high HHI. If all OS's are considered, however, the Apple-IBM share shrinks, only to rise again if the market expands to include hardware components. The theoretical consequence of these swings in concentration is that the smallest market approach is a poor predictor of market power because a firm producing many products along a spectrum of integrated products may in fact exercise more power in broader markets, as IBM does in computers generally. The practical consequence is that the FTC has too much discretion to strand the combining firms at one of the peaks of these swings.⁹⁴ If, as is the case with Taligent, potential entrants would take more than two years to challenge the venture in that market (narrowly defined),⁹⁵ then this initial definition

that improves the professional skills and earning prospects of FTC lawyers." Richard A. Posner, *The Federal Trade Commission*, 37 U. CHI. L. REV. 47, 86 (1969); see also Kenneth W. Clarkson & Timothy J. Muris, *Commission Performance, Incentives, and Behavior*, in *THE FEDERAL TRADE COMMISSION SINCE 1970: ECONOMIC REGULATION AND BUREAUCRATIC BEHAVIOR* 300 (1981). See generally George L. Priest & Benjamin Klein, *The Selection of Disputes for Litigation*, 13 J. LEGAL STUD. 1, 52-54 (1984) (81% success rate for government antitrust prosecutions explained by careful selection of cases for prosecution).

92. MERGER GUIDELINES, *supra* note 3, § 1.11. The Department will imagine the effect of a 5% price increase lasting one year in trying to determine "objectively" the result of the "small but significant and nontransitory" price increase.

93. See Figure 1, *infra* Part III(D).

94. See Figure 1, *infra* Part III(D), points plotted at market definitions C & E; discussion *supra* Part II(A).

95. MERGER GUIDELINES, *supra* note 3, § 3.2.

could induce an antitrust prosecution despite the fact that the firms exercise little market power.

Each product is in some way unique, even if that individuality stems only from the brand name. If the FTC desired, it could define a product market so narrowly as to include only the products of a single producer. While formerly unwilling to back up such narrow definitions, the courts have begun to support one-manufacturer markets.⁹⁶ The flexibility of market definition under the guidelines allows the enforcement agencies to derive a "concentrated" market when the firms in question cannot, in practice, exercise any market power to raise price above marginal cost. The broad market test would remove some of this flexibility by prompting the agency to consider the range of substitutes which compete, if only partially, with the firms' product.

In assessing the possible substitutes to the venture firms' products, the FTC asks four questions: (1) Have buyers considered shifting products in response to price changes? (2) Do sellers base their decisions on the prospect of buyer substitution? (3) What influence will downstream competition have in buyers' output markets? (4) What costs and delays will buyers incur switching products?⁹⁷ This analysis, though inherently imprecise, is further complicated in this case because Taligent's product (once again, depending on its definition) has yet to come to market. Buyers and sellers do not know what the possible substitutes are because they do not know how the new technology will interact with other products to change the industry's structure.⁹⁸ Price changes and use patterns are impossible to determine because there is no history behind the product, and little history behind the industry as a whole. Since the Merger Guidelines give no instruction on *potential* markets, following the guidelines will lead the FTC to make enforcement decisions about a hypothetical future market structure based on a product market defined from present conditions.

D. *Competing Market Definitions*

Following the Merger Guidelines' "smallest market" approach, the FTC might choose the present market for object-oriented OS as the initial relevant product market. This is not, however, the only plausible initial product market

96. *Eastman Kodak Co. v. Image Technical Services, Inc.*, 112 S.Ct. 2072, 2090 (June 8, 1992) (relevant market is parts for manufacturer's own machines). See Rule, *supra* note 11, at A17 ("Until the Kodak case, we expected that if and when the antitrust authorities translated their sillier rhetoric into action, we could count on economically astute judges as a bulwark. The Supreme Court decision in the Kodak case shakes that faith."). Charles Rule was Assistant Attorney General for the Antitrust Division in the Reagan Administration.

97. MERGER GUIDELINES, *supra* note 3, § 1.11.

98. An example of this is Microsoft's "Windows" software which has extended the life of Microsoft's MS-DOS OS and hampered IBM's efforts to create a market for its OS/2 software. Paul B. Carroll, *Giant Missteps: How an IBM Attempt to Regain PC Lead Has Slid into Trouble*, WALL ST. J., Dec. 2, 1991, at A1; John Markoff, *New Weapons Prolong the Computer Wars*, N.Y. TIMES, Apr. 5, 1992, § 4, at 5; John Markoff, *Software Détente for I.B.M.*, N.Y. TIMES, Feb. 28, 1992, at D1, D2.

definition. Other equally plausible market definitions include the future market for such software beyond the guidelines' two-year boundary, the market for all OS software, the market for all software, and even the market for all electronic data processing. These are not, in fact, inherently separate, easily defined markets, but rather convenient labels for product groups along a spectrum of overlapping, competing partial substitutes.⁹⁹ The danger in picking the wrong initial relevant product market under the guidelines' "smallest market"

FIGURE 1: *Product Market Share*

* Estimated From Publicly Available Material

99. "Partial substitute" means a product that duplicates some, but not all, of the product's functions. For instance, a PC is a partial substitute for a workstation computer system. Although a PC can run many of the same programs as a workstation, PC's generally have less internal memory and poorer network capabilities. Another good example of the partial substitute phenomenon is Microsoft's use of its Windows software to extend the life and functions of its DOS software. Windows is neither strictly an OS nor strictly an application program. Rather, it is a partial competitor of OS's because it replaced part of their functions.

approach is that an unjustifiably small initial market may produce such high concentration in the market that the FTC or the Antitrust Division will block a potentially pro-competitive business combination.

1. *The Present Object-Oriented OS Market*

The present market for object-oriented OS software is entirely unconcentrated since no product is currently on the market. NeXT Computer produces a "pseudo-object-oriented" system, but no company now sells a true object-oriented OS. Taligent hopes to ship a functioning object-oriented OS by 1994, but that date falls beyond the guidelines' two-year boundary period for considering substitute sources of supply. Thus, for enforcement purposes under the guidelines current structure, the FTC would consider the present market unconcentrated. The FTC will not block any combination in an unconcentrated market regardless of whether that combination involves the dominant firm.

2. *The Future Object-Oriented OS Market*

Had the FTC instead chosen the post-1994 market for "object-oriented operating system software" as Taligent's initial relevant product market, then the venture's domination of this prospective market would have produced such high concentration index scores that the FTC would have probably blocked the venture. The process for expanding the market definition through comparison of consumer shifts to competing technologies following a 5% price increase would be unlikely to enlarge the product market (and thus decrease concentration) in this case. Generally, in high-technology goods, producers compete more on the attributes of the individual product than on price. This is true not only because consumers consider the capabilities of the product in performing highly specific tasks, but also because the cost of an operating system represents only a small fraction of the cost of the entire computer system with which the OS must integrate.¹⁰⁰ In this case, opponents of the venture could argue that an object-oriented OS presented such a substantially different product that a 5% price increase above marginal cost would not cause consumers to switch to competing products. Moreover, critics could claim that no other company could shift sufficient production to object-oriented OS software within two years to significantly decrease Taligent's market power.

Both arguments are true, but they are also irrelevant to gauging Taligent's market power. Their irrelevancy demonstrates the problem with the smallest market test. By assuming object-oriented OS software as the initial relevant

100. Responding to this reality, OS manufacturers have sought to connect their products with other manufacturers' hardware. For instance, Microsoft backs Digital Equipment Corporation in the production of a new microprocessor chip to mesh with Microsoft's next-generation operating system. John R. Wilke, *Digital Chip Is Endorsed by Microsoft*, WALL ST. J., Feb. 26, 1992, at B6.

product market, the FTC would be stuck with an unjustifiably high concentration measure—a measure that fails to assess the competitive pressure from an array of partial substitutes. The FTC could not expand the market to decrease the concentration because the test outlined in the Merger Guidelines only allows expansion within the limited 5%/two-year boundaries. So defined, the product market would produce an extremely high HHI since, based on present forecasts, Apple and IBM will control the dominant share of the object-oriented OS market.¹⁰¹

3. *The All-OS Market*

Although a literal reading of the guidelines would demand the smallest market definition possible as the initial relevant product market, this is not the way the FTC actually defines markets. Rather, the Commission questions experts on the industry both within its own sizeable staff of economists and among neutral observers in other companies to better understand the industry's structure. Given this information, the smallest market the FTC could come to is all PC OS software. This new definition radically alters the size and structure of the market in which Taligent will operate by including the software giant Microsoft. But, this definition is still gravely problematic for two reasons, one scientific and the other legal.

The scientific reason demonstrates how any market definition represents not a static industry segment, but a convenient point on a dynamic spectrum of options whose uses and relative market shares change constantly with technological advances and with conventional measurement of the market's boundaries. Taligent intends to manufacture an OS for PC's, but PC software and PC's themselves are increasingly competing with more powerful workstations for users.¹⁰² Moreover, the lines that once segregated OS software from applications software are also increasingly blurring.¹⁰³ Were the FTC to choose PC OS software as the relevant initial product market, two scientific questions would present themselves. First, why choose only PC OS software and not workstation OS software as well? Second, why not include other software programs which approximate and might partially substitute for an OS? The answers to these questions entail radically different market structures and

101. Taligent may not completely control the object-oriented OS market if enforcement authorities define that market to include NeXT Computer's "pseudo-object-oriented" OS which is already on sale but has gained little acceptance and failed to turn a profit. Kathy Rebello & Robert D. Hof, *Steve Jobs Has a New Fix for NeXT: Software*, BUSINESSWEEK, Nov. 18, 1991, at 72. NeXT's OS is not a true object-oriented system because it does not actually use programming objects. Rather, it packages language commands to appear as objects to the user. Keegan & Long, *supra* note 40.

102. "The distinctions between personal computers and workstations are beginning to blur." Kelli Wiseth et al., *When Worlds Collide: Macs Versus Workstations*, MACUSER, Jan. 1992, at 112, 120.

103. For example, Microsoft's Windows program combines many features of an OS (e.g., it coordinates other programs' functions with the hardware capacity), but it is "apparent" to the user (as opposed to "transparent") in that it plays a visible role in sorting data, the traditional function of applications software.

consequent changes in measured concentration. For example, including workstation OS software means figuring the UNIX OS, the most popular workstation OS, into the concentration index and allocating a large market share to AT&T, UNIX's main proprietor, and including other software programs which can partially substitute for an OS means adding the sales of Windows to Microsoft's already dominant market share from DOS.

The legal reason the definition of concentration is problematic illustrates an antitrust paradox.¹⁰⁴ Antitrust law aims to break down market power by blocking combinations and cooperation among competitors in concentrated industries. But the question which the Merger Guidelines in particular and antitrust law in general has never satisfactorily resolved is whether to block combinations in a concentrated industry when the combining firms are *not* the firms with dominant market shares. This issue emerged in *United States v. Bethlehem Steel*.¹⁰⁵ The Department of Justice sued to enjoin a merger between Bethlehem Steel and Youngstown Sheet & Tube Company, which enjoyed 15.4% and 4.7% market shares respectively in the iron and steel industry. The structure of the industry produced high concentration ratios and would have produced an HHI in excess of 1300 had that index been used. The court thus dismissed Bethlehem's argument that the combination of Bethlehem and Youngstown, though increasing concentration, retained substantial pro-competitive effects because it would allow Bethlehem to compete more effectively with the dominant firm, U.S. Steel Corporation, which had nearly 30% of the market.¹⁰⁶

While *Bethlehem Steel* was tried prior to the institution of the Merger Guidelines, under the guidelines the FTC would have to consider what that case explicitly ruled out: the pro-competitive effect of a combination. In *Taligent's* case, under the all-OS software market definition, the competitiveness calculation would involve balancing the combined IBM and Apple capabilities against Microsoft's dominant position. Microsoft currently controls as much as 80% of the PC OS market.¹⁰⁷ It enjoys healthy shares of the applications markets for both IBM-compatible¹⁰⁸ and Apple machines.¹⁰⁹ Thus in a strictly PC OS market, the HHI of more than 8000 would bring close scrutiny to any combination which raised concentration levels, even though the product of the combination might actually provide a more effective competitor to the market

104. Cf. BORK, *supra* note 32.

105. 168 F. Supp. 576 (S.D.N.Y. 1958).

106. "A merger may have a different impact in different markets—but if the proscribed effect is visited on one or more markets then it matters not what the claimed benefits may be elsewhere." *Id.* at 618.

107. Keegan & Long, *supra* note 40.

108. Microsoft's Senior Vice President for its applications division suggested that "Microsoft might be able to achieve as much as a 70% share in every major applications category." Zachary, *supra* note 63, at B3.

109. Microsoft controls 30% of the worldwide Apple applications software market with a much larger share in certain sectors (e.g., 92% in integrated software). Andrew Gore, *Love-Hate Relationship Binds Apple, Microsoft*, MACWEEK, Dec. 3, 1991, at 1.

leader. In a slightly broader market encompassing applications software, while Microsoft's dominant share would decrease (and the HHI with it), Microsoft would maintain a large market share while IBM's and Apple's smaller market shares grew in proportion to the size of the market.¹¹⁰ This market, encompassing all applications and OS software, would be so large, however, that even the combined market shares of Microsoft, IBM, and Apple would not boost the concentration index into the enforcement range.

This difficulty in defining markets points out the failures of the current enforcement regime's focus on analysis of static, as opposed to dynamic, industries.¹¹¹ Not only is it hard to define a product market based on present sales trends, but in a rapidly evolving high-technology market, it is hard to define a product which continually changes both in its internal characteristics (such as the speed and fluidity of the operating system) and in its interaction with other similarly developing products (such as the interaction of OS software and continually advancing microprocessor hardware.)¹¹² Moreover, advances in OS's have allowed software writers to gradually assume more detailed direction of smaller and smaller pieces of data.¹¹³ This blurring of the lines between traditional hardware and software functions further complicates defining relevant product markets.

4. *The PC Hardware and Software Market*

Expanding the initial relevant product market to include PC hardware as well as software, however, would quickly increase IBM's and Apple's market shares. IBM controls some 20% of the PC hardware market, and Apple enjoys a market share in excess of 10%. Apple and IBM are the two dominant PC firms, and their cooperation in that capacity raised Senator Metzenbaum's concerns about coordinated production decisions among the industry leaders.¹¹⁴ Expanding the market definition even further to include other electronic data processing mechanisms would paradoxically increase concentration rather than dilute the concentration index for the market. Including the workstation and mainframe businesses that are the heart of IBM's traditional business, and an area which Apple is urgently attempting to enter, would cause the combining firms' market shares to rise.¹¹⁵ The theory behind the FTC's "smallest mar-

110. IBM's and Apple's all-software market shares total near 10% and give corresponding HHI's well below 1000. Keegan & Long, *supra* note 40.

111. See Janusz A. Ordover & Robert D. Willig, *Antitrust for High-Technology Industries: Assessing Research Joint Ventures and Mergers*, 28 J.L. & ECON. 311, 311 (1985) ("Current product market structure . . . affects current pricing decisions, but it may also affect the rate and direction of inventive activity.").

112. Andrew Pollack, *Gridlock at the Chip-to-Microprocessor Intersection*, N.Y. TIMES, Mar. 22, 1992, § 3, at 11 (describing advances in microprocessor interaction with memory).

113. Keegan & Long, *supra* note 40.

114. See points plotted at market definition E, Figure 1, *supra* Part III(D). See also *supra* notes 61-62.

115. See points plotted at market definition F, Figure 1, *supra* Part III(D).

ket" approach to market definition would suggest that HHI's decline in a smooth curve as the market expands. In the markets in which Taligent will compete, the HHI's alternately rise and fall as the market definition expands, producing an erratic curve.

This unexpected behavior of the concentration index demonstrates a larger problem with the "smallest market" test. Interpreted literally, the test is likely to produce the wrong enforcement answer in the context of innovative industries and multiproduct firms. If the initially selected product market is too small, the enforcement agency may enjoin a pro-competitive combination. This initial selection represents a guess about the industry's structure and may be manipulated to produce the politically desired enforcement result. If the initially selected product market is too broad, the enforcement agencies may overlook monopoly power at lower market levels, such as the power to raise prices on a given scarce component of a multicomponent mechanism. Though seemingly counterintuitive, the solution to the dilemma of the "smallest market" test is to turn it on its head and analyze the industry starting from the broadest market.

IV. CONCLUSION

Since the adoption of the 1984 Merger Guidelines, the FTC and Antitrust Division have, with notable exceptions, used their discretion in defining markets reasonably well. The adoption of new Merger Guidelines in April 1992 signalled the enforcement authorities' recognition of the need to reform the enforcement process. Despite changes to other sections, however, the new guidelines leave intact the smallest market approach that creates confusion, fear and overenforcement. Recent examples of increased enforcement efforts and the high stakes involved in innovative industries demand a clearer market definition standard, one more lenient toward pro-competitive cooperation. Replacing the "smallest market" test with the "broad market" approach of this Note would ease fears of renewed aggressive antitrust enforcement and help high-technology firms compete with cartelized foreign competitors.