

ARTICLES

INNOVATION, COOPERATION AND ANTITRUST

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I. INTRODUCTION

In this essay we contend that antitrust is an important component of our *de facto* industrial policy, and that it is one among several factors that is impeding innovation and subsequent profitable commercialization in the United States today. We believe that governmentally-sponsored strategic coordination of industrial and technological development among certain of our trading partners requires a U.S. response. We doubt that the U.S. government can or should respond with similar initiatives. We favor instead response by the private sector, but believe that options are circumscribed by current antitrust policy that in many instances inhibits beneficial information exchange and strategic coordination, unless accomplished via merger. We propose certain antitrust reforms that would align U.S. antitrust policy to today's global realities, and to antitrust policy in Europe and Japan.

The changes we propose in antitrust law would facilitate a more rapid response by American "high technology" industries or product groups¹ to competitive challenges, because firms would have available a

1. We define high technology industries or product groups as those which are research intensive and/or are experiencing rapid technological change. Researchers have used a number of means to identify individual industries or product groups as

richer variety of organizational mechanisms and resources to respond to "targeting" strategies from abroad. The additional strategic flexibility and capacity we seek to provide would apply only where technological change is rapid and markets are global. Thus, firms in fragmented industries such as microelectronics and biotechnology would be largely exempt from most aspects of U.S. antitrust law, and even firms in more concentrated industries like civilian aircraft would probably be able to form certain co-development and co-production alliances that would be problematic under antitrust law today. Our proposed changes are no panacea for the U.S. economic dilemma, but they can nevertheless provide a useful catalyst for the macroeconomic policy changes that are undoubtedly required. Most importantly, they can free U.S.-based firms to develop and commercialize new technology proficiently and profitably.

We do not argue for special favors for high technology industry.² Rather, we point out that our antitrust policy -- derived largely from the competitive circumstances prevailing in oligopolistic industries operating in largely domestic markets -- imposes unnecessary restrictions on high technology industries. Such industries are practically immune from the potential for cartelization because of uncertainties generated by domestic and international competition. Moreover, given the pace of change, high technology industries are especially burdened by the tardiness and uncertainty with which antitrust disputes are resolved. In our view, limiting interfirm cooperation with strict antitrust enforcement is generally not needed in the circumstances we contemplate, because international competition and new and unexpected market entry are especially strong.

"research intensive." These methods usually employ some measure of the R&D effort undertaken in the industry or product group, normalized for industry size. However, in some industries, the relevant R&D is performed internally; in others, firms depend on the innovations of those upstream suppliers that provide input to their production processes. To address this complicated technological structure, the U.S. Department of Commerce (DOC) uses an input-output table to allocate the applied research and development expenditures of intermediate-goods producers among the appropriate final-goods producers. This allocation, when normalized by shipments, permits identification of groups of products whose total R&D intensity is significantly higher than that of other products. These product groups are known collectively as the DOC-3 high-technology products. They are: guided missiles and spacecraft; communication equipment and electronic components; aircraft and parts; office and computing machines; ordinance and accessories; drugs and medicine; industrial inorganic chemicals; professional and scientific instruments; engines, turbines, and parts; and plastic materials and synthetics. In 1985 shipments in these industrial categories were valued at \$395.8 billion or 16.9% of all manufactured goods shipments. See NAT'L SCIENCE BD., SCIENCE & ENGINEERING INDICATORS 314 (1988).

2. While they are not necessary to our argument here, we do, however, believe that high technology industries do warrant special support. This is because they are often both "leading" and "strategic." For the best treatment of these arguments, see R. NELSON, HIGH TECHNOLOGY POLICIES 1 (1984).

To the contrary, we believe that strategic coordination is often needed, particularly when industries are fragmented or are exposed to coordinated policy initiatives from abroad. Antitrust policy in the U.S. has been structured to police slower changing, concentrated industries where cooperation may lead to cartellization; current antitrust policy is not designed to allow the interaction and coordination needed to successfully develop and profitably commercialize new technology. Thus, while current antitrust policy may be appropriate for the breakfast cereals industry, it does not well serve the semiconductor industry. Most other advanced countries have recognized this for quite some time.

There are several aspects of current antitrust policy toward high technology industries which concern us. However, in this essay we deal only with questions of cooperative behavior between firms. "Single firm" issues, such as predatory pricing, essential facilities, tying, product preannouncements and the like are dealt with in a separate paper.³ In treating cooperative behavior, we first outline the interactions between and among organizational units that innovation requires. We then discuss the various organizational arrangements that can facilitate such innovation. In particular, we examine how industrial structure impacts interactions and coordination. We then discuss how current antitrust law impedes cooperative innovation. We make explicit comparisons to Japan's and Europe's institutions and legal environment. Finally, we suggest how modification of U.S. antitrust can increase the menu of organizational forms available to American firms, thereby placing them on the same footing as their foreign competitors.

II. CHARACTERISTICS OF INNOVATION

A. Nature of Innovation

Few would dispute that innovation is important to economic growth, economic development, and economic welfare. Yet antitrust analysis largely ignores it. The reason is not that Congress and the courts dismiss its importance. Rather, it is that economists and legal scholars have been slow to incorporate technological change and its consequences into antitrust analysis. Lawyers and economists know very little about innovation, and as they do begin to understand it, there is a tendency to despair because taking it into account impairs if not destroys the validity of the simple model that many use to deal with

3. Our initial views on this subject are set forth in Jorde & Teece, *Innovation, Cooperation, and Antitrust*, presented at the U.C. Berkeley Conference on Antitrust Innovation, and Competitiveness (Oct. 1988).

antitrust policy issues. We believe that much of the accepted analytical apparatus should be abandoned in favor of a conceptual framework which explicitly takes innovation and its organizational requirements into account. We now outline that framework after defining a few key terms.

We view innovation as the search for, and the discovery, development, improvement, and adoption of new processes, new products, and new organizational structures and procedures. It involves risk taking and uncertainty. It involves probing, experimenting, testing, and re-probing. "Dry holes" and "blind alleys" are the rule and not the exception. Above all, innovation is a cumulative activity that involves building on what went before, whether it is inside the organization or outside the organization, whether the organization is private or public, whether the knowledge is proprietary or in the public domain.

Innovation is also characterized by sunk costs and strong irreversibilities. One form of irreversibility occurs once a new product displaces the old. It is unlikely that the old product will ever reappear in the market, regardless of the relative factor price⁴ swings that might occur. One reason is that innovation often brings forward such tremendous performance and cost advantages that no change in factor prices in the future is likely to reincarnate the old product. Another reason is that learning is cumulative. Once a technology is selected and used, it is likely to generate further learning by user-developed enhancements, while the old technology will have no user interaction and thus will remain relatively stagnant. For example, natural ice making is unlikely to reemerge to challenge the refrigerator, vacuum tubes are unlikely to challenge the transistorized integrated circuit, and the steam engine is unlikely to challenge the internal combustion engine.⁵

Technological innovation involves much much more than R&D. Innovation is an interactive, reiterative and interdependent process in which design, manufacturing, and product development all drive research and, at the same time, are highly dependent on research. Products must be rapidly advanced to the marketplace so that feedback can be factored into research and manufacturing. Also, economic rents must be secured before the next generation of product displaces the current product in the market. These later stage activities can be referred to as commercialization.

4. A "factor price" refers to the price of one of the various components ("factors") involved in producing a product, such as land, labor, capital, etc.

5. There may be exceptions to this rule. For example, with new advances in turbines and propellers, propeller driven jets may reemerge to challenge the fan jet. However, these exceptions occur infrequently and do not significantly undercut the general learning regarding irreversibilities.

Technological innovation is also accompanied by powerful free rider and public good characteristics. The implications of this for anti-trust policy are considerable, as we point out later. Know-how leakage and spillovers⁶ impair incentives to innovate, by redistributing benefits to others, particularly competitors and users. To maintain adequate incentives to invest in innovative activity, without providing government subsidies, free riding must be curtailed, either by private action or by public policies.

The degree to which free riding activity is constrained by the mechanisms of intellectual property law (patents, trade secrets, copyright) in a particular industry or field of technological development is what we refer to as the appropriability regime in an industry. The appropriability can be strong (free riding is constrained; patents are available and inventing around them is difficult) or weak (free riding is unconstrained; patents are not available or inventing around them is easy).

Surveys show that intellectual property law has a limited ability to protect technologies from free rider activity.⁷ Despite recent efforts by the courts to tighten intellectual property enforcement, most industries in the U.S. are characterized by weak appropriability.

The limitations of intellectual property protection require that commercialization activities be conducted effectively and efficiently, in order to extract wealth from intellectual property. Since much intellectual property can be copied, success in the marketplace often depends on who is first to commercialize and who has the lowest costs. However, commercialization is both costly and risky, perhaps even more so than R&D activity. Even Karl Marx recognized "[t]he greater cost of operating an

6. A spillover -- or what an economist would call an externality -- occurs when the investment activity of one business benefits (or burdens) another business which is not part of the activity. For example, when the telecommunications industry developed fiber optics it provided a spillover to the medical products industry.

7. See R. Levin, A. Klevorick, R. Nelson, and S. Winter, *Appropriating the Returns from Industrial Research and Development*, 3 PAPERS ON ECONOMIC ACTIVITY, 783 (1987)(hereinafter R. Levin, A. Klevorick). Yale researchers surveyed R&D managers in various industries. The survey shows that, on a seven-point scale (1 = not at all effective, 7 = very effective) for 18 industry categories with 10 or more respondents, managers in only chemical (specifically drugs, plastic materials, inorganic chemicals, and organic chemicals) and petroleum refining rated process patents effectiveness higher than four on the scale, and only these same chemical industries and steel mills rated product patents higher than 5. The Yale survey underscores what many have suspected: patents possess limited effectiveness as a means of capturing value from innovation. These findings make very clear that managers have little confidence that patents suffice as mechanisms to protect intellectual property from free rider.

The results also show that other methods of appropriation such as first mover advantages (lead time and learning curve advantages), secrecy, and investment in co-specialized assets such as sales or service support, were more effective. These other methods of appropriation are elements of business strategy and conduct.

establishment based on a new invention as compared to later establishments arising *ex suis ossibus* [from its bones]. This is so very true that the trail-blazers generally go bankrupt, and only those who later buy the buildings, machinery, etc., at a cheaper price make money out of it."⁸ We want to underscore that the process of innovation is not over but has only just begun when the idea or the prototype comes out of the R&D laboratory.⁹

B. Returns to Innovation¹⁰

Most innovative activity takes place in appropriability regimes that are weak. Additionally, business strategy has limited effectiveness as a device to channel profits toward innovators and away from imitators. Therefore, there are typically large positive spillovers from innovation, and a corresponding underinvestment in innovative activities. Empirical studies have established that these spillover effects are very large indeed, so much so that anyone familiar with the evidence has to be puzzled by the failure of both theorists and policy makers to pay more attention to them.¹¹

8. K. MARX, *CAPITAL* 3: 103 (Foreign Languages Publishing House ed. 1959).

9. For a recent discussion of the importance and difficulties of profitable commercialization, see *PICKING UP THE PACE: COUNCIL ON COMPETITIVENESS, THE COMMERCIAL CHALLENGE TO AMERICAN INNOVATION* (1988).

10. For an excellent survey, see P. STONEMAN, *THE ECONOMIC ANALYSIS OF TECHNOLOGICAL CHANGE* 228-38 (1983).

11. We first comment upon a line of argument that runs the other way. There are various theoretical conditions under which it can be shown that a market system will provide incentives for too much investment in innovation. Dasgupta and Stiglitz have developed a model in which with some appropriability and competitive conditions, competition may result in excessive expenditures on R&D relative to the social optimum (which is set by the equating of marginal benefits and costs). Dasgupta & Stiglitz, *Uncertainty, Industrial Structure and the Speed of R&D*, 11 *BELL J. ECON.* 1 (1980). For related literature on patent races, see Dasgupta & Barzel, *Optimal Timing of Innovations*, 50 *REV. ECON. & STATISTICS* 348 (1968); Dasgupta & Stiglitz, *Industrial Structure and the Nature of Innovative Activity*, 90 *ECON. J.* 266 (1980). These authors stress that with effective patenting, firms may collectively overinvest in R&D in their race to secure the patent and the monopoly rights it entails.

Hirschleifer has made a different argument that also leads to the private returns being greater than social returns. Hirschleifer argues that in a complete contingent claims economy, firms can take short positions in assets that will decline in value as a result of the innovation, and long positions in assets that will increase in value. By trading on what amounts to insider information on the economic impact of the innovation, innovators can conceivably secure private returns greater than the social returns to innovation.

These arguments, while logically correct, are built on unrealistic assumptions. The patent race literature is at best only applicable to the few instances discussed above where patents are of some moment. And the perfect foresight-complete contingent claims model of Hirschleifer is clearly not very applicable, though innovating firms undoubtedly partially implement this strategy where possible. However, not an iota of empirical evidence exists to suggest that they have any policy relevance. This revisionist

A brief survey of the available empirical evidence strongly supports the proposition that the social returns to innovation are markedly greater than the private returns. This suggests that antitrust policies should permit firms, in certain circumstances, to engage in private strategies to foreclose imitators, even though one consequence might be possibly to raise short-run prices to consumers. One likely consequence of permitting foreclosure conduct will be more vigorous competition; firms will be willing to invest more in R&D and new product introductions. Without such private arrangements, further public subsidy of the innovation process, including its commercialization, may be required to enable U.S. business to compete internationally.

Although the evidence is incomplete, it indicates that the social welfare impact of innovations is robust across a wide variety of industries, economies, and methodologies. For instance, Mansfield and his researchers have generated estimates of the social and private rates of return for innovation in a firm operating in petroleum refining, an industry that has been identified as possessing strong appropriability.¹² The methodology he uses to measure returns to society is quite conservative.¹³

Yet the private rates of return in Mansfield's sample vary from 214 percent to less than zero percent, with a median return of 25 percent, while social rates of return are in the range from 209 percent to less than zero percent with a (lower bound) median return of 56 percent. In particular, Mansfield found that in 30 percent of the cases the private rate of return was so low that no firm, with the advantage of hindsight, would have invested in the innovation, but the social rate was so high that from society's point of view the investment was well worthwhile. Interestingly, Mansfield's analysis of the differences between social and private rates of return suggests that the more radical, as well as the more easily imitated, innovations showed the greatest differences between rates of return.¹⁴

theoretical literature has nevertheless served to unnecessarily muddy the policy debate and may have served to check economists' enthusiasm for policies that promote innovation.

12. E. MANSFIELD, J. RAPPAPORT, A. ROMEO, E. VILLANI, S. WAGNER & F. HUSIC, *THE PRODUCTION AND APPLICATION OF NEW INDUSTRIAL TECHNOLOGY* (1977).

13. Mansfield compares the welfare gains to innovation with a counter-factual path on which innovation still occurs, but at a later date. The costs involved in generating the innovation are essentially the R&D costs, capitalized to the date of innovation. Rates of return are calculated relative to these costs. Specifically, private rates of return are calculated as the increase in the innovator's revenues relative to its R&D expenditure. *Id.*

14. Mansfield's work supports and extends earlier work of Grilliches, Fellner, and others. For a layman's review of earlier studies, see Mansfield, *Contribution of R&D to Economic Growth in the U.S.*, 175 *SCIENCE* 477 (1972).

Economic historians have provided an equally insightful stream of literature on the social returns to innovation. Several authors have attempted to analyze the impact of major technological innovations on an economy's performance. Social savings from a new technology have been defined as the loss that would be imposed on an economy if a more efficient known technology had not been available. In the case of railroad technology, this would comprise the extra cost of transporting commodities by alternative, less efficient modes. For freight transport only, Fishlow estimates that without the invention and building of the railroads, these costs for the U.S. in 1859 would have been \$134 million; Hawke estimates these costs for England and Wales in 1865 would have been around 28 million pounds; Metzger estimates these costs for Russia in 1907 would have been 890 million rubles. These are the extra costs estimated to have arisen if the commodities actually shipped by the railways in the specified year had to be shipped by other means.¹⁵

A related stream of research has attempted to measure the effect of a nation's rate of technological change on its rate of economic growth. Several influential studies carried out in the 1950s, including Fabricant¹⁶ and Solow,¹⁷ indicate that about 90 percent of the long-term increases in output per capita in the U.S. was attributable to technological change, increased educational levels, and other factors not directly associated with increases in the quantity of labor and capital. A subsequent and more exhaustive study stated that "advances of knowledge" contributed about 40 percent of the total increase in national income per person employed during 1929-57.¹⁸

Quite recently, a new stream of research has emerged on interindustry technological spillovers. Levin and Reiss, with a cross-section sample of manufacturing firms, estimated that a one percent increase in R&D spillover from one industry caused average costs to decline by .05 percent.¹⁹ Jaffe, also using a cross-section data, estimated that when the

15. The magnitude of social savings come into focus when expressed as a percentage of GNP. These are 3.3 percent, 4 percent, and 4.6 percent for the three studies cited above. Fogel's independent estimates for the USA in 1890 come to 4.7 percent of GNP. R. FOGEL, *RAILROADS AND AMERICAN ECONOMIC GROWTH: ESSAYS IN ECONOMETRIC HISTORY* 223 (1964). These percentages seem small, but they refer solely to the "loss in GNP" that the absence of railways for one year would effect. O'Brien argues that if no railways existed for the whole of 1859-90, the GNP in 1890 would have been some 10 percent lower. P. O'BRIEN, *THE NEW ECONOMIC HISTORY OF THE RAILWAYS* (1977).

16. S. FABRICANT, *ECONOMIC PROGRESS AND ECONOMIC CHANGE*, (34th Annual Report of the National Bureau of Economic Research, 1954).

17. Solow, *Technical Change and the Aggregate Production Function*, 39 *REV. ECON. & STATISTICS* 312, 320 (1957).

18. E. DENISON, *THE SOURCES OF ECONOMIC GROWTH IN THE UNITED STATES AND THE ALTERNATIVES BEFORE US* 272 (1962).

19. R. Levin and P. Reiss, *Test of a Schumpeterian Model of R&D and Market Structure, R&D, PATENTS, AND PRODUCTIVITY* (2 Griliches 1984).

spillover increased by one percent, profit increased by .3 percent.²⁰ Bernstein and Nadiri investigated the effects of interindustry R&D spillovers in five high technology industries where each industry was treated as a separate spillover source.²¹ The authors found, among other things, that the scientific instrument industry generated spillovers for the chemical products industry. These spillovers caused the industries' variable costs to decline. Chemical products, electrical products, and transportation equipment all caused positive spillovers for the non-electrical portion of the machinery industry, while electrical products were influenced by R&D spent on scientific instruments. Every industry examined in the study was a source of spillovers for at least two other industries.

The existence of such interindustry R&D spillovers implies, to the extent that the different industries are not under common ownership, that the social return to investment in R&D is greater than the private return. This was borne out by the average rates of return found in the Bernstein and Nadiri study.²² Interestingly, the social rates of return to chemical products are not especially high, averaging 26 percent for the three years studied. This is consistent with the findings of the Yale survey, which indicates that patents are relatively effective here.²³ By contrast, the scientific instruments industry has low appropriability,²⁴ and the spillovers were tremendous -- 10 times the private rates. The Bernstein and Nadiri findings are extremely provocative in that they not only show high social rates of return, but also considerable variation across industries -- variations seemingly related to the degree of tightness of the appropriability regime.

The studies mentioned here have examined different aspects of innovation. The social rates of return literature focuses on rates of return to investment in innovation; the economic historians look at the question of the impact of a new technology by users; the macro studies look at the impact of technology on economic growth, and the spillover studies

20. Jaffe, *Technological Opportunity and Spillovers of R&D: Evidence from Firms' Patents, Profits and Market Value*, 76 AM. ECON. REV., 984, (1986).

21. J. BERNSTEIN & M. NADIRI, INTERINDUSTRY R&D SPILLOVERS, RATES OF RETURN, AND PRODUCTION IN HIGH-TECH INDUSTRIES (National Bureau of Economic Research Working Paper No. 2554, 1988).

22. The average social rates of return for five industries and 3 years -- 1961, 1971 and 1981 -- were as follows: chemical products 26 percent; non-electrical machinery 54 percent; electrical products 24 percent; transportation equipment 13 percent; and scientific instruments 134 percent. *Id.* at 25. These rates of return are biased downwards, as they only consider spillovers to user industries and omit gains to final consumers.

23. R. Levin, A. Klevorick, *supra* note 7.

24. "Scientific instruments" coincides roughly with "measuring devices" in the Yale study. This industry scored less than moderately effective with respect to managers' views of the efficiency of product and process patents.

look at how innovation in one industry impacts costs in another. Yet, they all reach the same unambiguous conclusion: Investment in innovation and its commercialization generates strong positive externalities. Policies that hinder innovation by focusing on short-run static efficiencies and inefficiencies, as well as welfare gains and losses, will likely have strong negative impacts on economic welfare (especially in industries characterized by weak appropriability regimes) and further opportunities for innovation.²⁵ The evidence overwhelmingly indicates that if policy makers must choose between static and dynamic efficiencies, they should choose the latter.²⁶ In light of this, we find it remarkable that the literature detailing the potential burdens current antitrust policy is placing on innovation is not more voluminous. We speculate on the reasons for this below.

First, the industrial organization literature in the immediate post-Schumpeterian era was diverted into a discussion and analysis of a possible causal relationship between market structure (especially the degree of concentration within a market) and innovation. Hence, the analysis bogged down on single-firm monopoly issues, firm size and innovation relationships, and it neglected the consideration of organizational forms and their relationship to the innovation process; a crucial omission because there is increasing evidence that organizational structure and the form of governance structure an economy possesses do affect innovation.

25. This possibility has not gone unnoticed by others. William Baxter (head of the Justice Department's Antitrust Division during the Reagan Administration), notes: "The contribution of technological advances to our economic well-being is very substantial when compared with the damage that could be caused by the restrictive behavior antitrust laws seek to halt. If our antitrust laws were to impede technological development to any substantial degree, the net effect of those laws on our well-being would surely be negative." W.F. Baxter, *Antitrust Law and Technological Innovation*, ISSUES IN SCI. & TECH. (Winter 1985).

Schumpeter, of course, recognized this logic half a century ago when he noted:

A system -- any given, economic or other -- that at every given point in time fully utilizes its possibilities to the best advantage may yet in the longer run be inferior to a system that does so at no given point of time, because the latter's failure to do so may be a condition for the level of speed of long-run performance.

J. SCHUMPETER, CAPITALISM, SOCIALISM, AND DEMOCRACY 82 (1942).

The social returns literature, practically all of which has been developed in the post-Schumpeterian period (Joseph Alois Schumpeter 1883-1950), provides a convincing empirical underpinning for this aspect of Schumpeter's hypothesis.

26. While the evidence is never as good as one would like, the fact is that there is *no* evidence supporting the notion that returns to innovation in the U.S. economy are too large.

Static analysis involves studying a system where only one variable may be modified at a time. Dynamic analysis involves a system where all the variables can move simultaneously. Since spillovers from one firm (a variable) effect many other firms (other variables in the system), dynamic analysis more accurately reveals the gains from innovation.

Moreover, the evidence available today suggests that if there is a link between market structure and innovation, innovation will likely determine market structure, not vice-versa.²⁷ Although appropriability is apparently positively related to an industries' rate of innovation,²⁸ concentration is an unsuitable indicator of appropriability. Hence, neither concentration nor fragmentation is likely to foster innovation, and so public policy ought not attempt to regulate market structure to influence innovation.

Second, because organizational structure has not been studied by economists until recently, the impact that antitrust law has on cooperative contracts, and thus on appropriability and other factors, has not been considered.

Third, until recently, there had not been an available alternative national model of an economy that was performing as well or better than the American economy. American innovative capacity and technological prowess in the 1950s, 1960s, and early 1970s was not much disputed, and willingness to explore the shortcomings of American institutions and policies was correspondingly diminished. The failure of the American economy to maintain rates of innovation and growth commensurate with Japan is causing a fundamental re-examination in some circles, a process that we believe is beneficial. It is also bringing into better focus the interorganizational requirements of the innovation process, a matter to which we now turn.

C. Organizational Requirements of Innovation

Industrial organization textbooks have traditionally and almost exclusively discussed horizontal cooperation and competition in terms of standard cartel theory. On the other hand, vertical cooperation/contracting is viewed differently, and some textbooks provide treatments of supplier-buyer relationships in which cooperation is viewed as efficiency enhancing. However, in both the textbooks and in policy discussion among economists, the primary purpose of cooperation among competitors is still primarily viewed as nefarious. Cooperation among competitors is today perhaps the last bastion of what was once referred to as the "inhospitality tradition" in antitrust. The result is that

27. Several studies have shown an inverted U-shaped relationship between concentration and R&D industry, and between concentration and the rate of innovation. However, it has been shown that when measures of appropriability and technological opportunity are entered into the equation, concentration no longer becomes statistically significant. See R. Levin, W. Cohen, & D. Mowery, *R&D Appropriability, Opportunity and Market Structure*, 75 AM. ECON. REV. 20 (1985).

28. R. Levin, A. Klevorick, *supra* note 7, at 812.

there is very little literature that addresses how cooperation among competitors can often promote competition.

Nevertheless, cooperation among competitors can not only promote competition, but may be essential if innovating firms are to compete in today's increasingly global markets. This conclusion is drawn not only from observing successful players in today's market,²⁹ but also from a developing understanding of the innovation process as described below. We first examine traditional models of innovation that have served as a basis for current antitrust policy. Next, we critique this model and examine improved modeling techniques. Finally, we discuss innovation during development and commercialization in light of the new, more realistic models of innovation.

1. COOPERATION IN RESEARCH AND DEVELOPMENT

Because of the complexity of the innovation process, it is first necessary to build some kind of conceptual model of what is involved in the activity that we commonly refer to as innovation.³⁰ The traditional model, having its origins in the description and analysis of "big technology" projects, is described below. Its inadequacies are then addressed in light of the more cyclic or "simultaneous" nature of the process, particularly in certain industries experiencing high rates of technological change. Implications for antitrust policy are then explored.

a. The "Serial" (Traditional) Model

Traditional descriptions of the innovation process commonly break it down into a number of stages which proceed sequentially, albeit with significant overlaps if the project is on a fast track. According to this view, the innovation process proceeds from research to development, design, production, and then finally to marketing, sales, and service. In simple models, there is no feedback or overlap between and among stages. This representation may once have been appropriate, but it no longer accurately characterizes the innovation process.

The innovation process does not necessarily begin with research; nor is it serial. At the center of the innovation process is design, not science. Research is often spawned by the problems associated with trying to get the design right. Moreover, technological developments draw on an array of sciences. Indeed, important technological breakthroughs can often proceed even when the underlying science is not understood.

29. See *infra* Section IV.

30. For a fuller description, see D. Teece, *Interorganizational Requirements of the Innovation Process*, 10 *MANAGERIAL & DECISION ECON.* 1 (forthcoming 1989).

Products can often be made to work without much knowledge of why. Airframe design in the aircraft industry, for instance, has a large empirical component. Certain designs are known from experimentation to have certain performance features. However, the underlying scientific understanding of airframe design is rudimentary. Accordingly, wind tunnel testing is still an essential part of the development process. Many other industries similarly find that innovation does not originate from basic science.

The serial model also underemphasizes the importance of process innovation (innovation in the manner a product is produced rather than innovation in the product itself). Indeed, if the serial model fits innovation at all, it fits perhaps only for product innovations. Process innovations often do not require marketing, and may not even require new tooling. Nor does the serial model address the many small but cumulatively important incremental innovations which are often at the heart of technological change. The serial model has a macro project orientation; but as we know, this is not the way in which most innovation proceeds.

b. The Cyclic Development Process

In reality -- with uncertainty, learning, and short product life cycles -- innovation requires rapid feedback, mid-course corrections to designs, and redesign. Feedback and trials are essential, especially if incremental rather than radical innovation is at issue. Furthermore, incremental improvement is a good deal of what innovation is all about. Incremental improvement took the micro-electronics industry from one bit on a chip to several million. Incremental improvement is what gives us better airplanes and better computer printers every year. In order to succeed at these crucial incremental improvements, a team designs a new version of the product and, working closely with manufacturing, and marketing, brings it to market. This is where development speed is critical. The prior product generation is already in the marketplace, open to reverse engineering and imitation. Hence, the firms that can get out the next generation product in the shortest time are likely to expand their market share.

Gomory has termed the modern development process "cyclic," while Kline and Rosenberg have proposed the term "chain-linked" to describe this process.³¹ These new conceptualizations recognize aspects of the serial model -- for example the flow of activity through design to development, production and marketing -- but also recognizes the

31. R. Gomory, *Dominant Science Does Not Mean Dominant Product*, RES. & DEV., at 72 (Nov. 1987); S. J. KLINE & N. ROSENBERG, *An Overview of Innovation*, THE POSITIVE SUM STRATEGY (N. Rosenberg & R. Landau eds. 1986).

constant feedback between and among "stages." Moreover, "the linkage from science to innovation is not solely or even preponderantly at the beginning of typical innovations, but rather extends all through the process . . . science can be visualized as lying alongside development processes, to be used when needed."³²

The identification of user needs is critical to the profitable expenditure of R&D dollars. Therefore, R&D personnel must be closely connected to the market and to marketing personnel. Scientists must have one foot in the lab and one in the marketplace. Knowing *what* to develop and design, rather than just how to do it, is absolutely essential for commercial success. Developing this understanding involves a complex interplay between science, engineering, manufacturing, and marketing in order to specify product functions and features. It is not just a matter of identifying user needs and assessing engineering feasibility. One must also separate those user needs which are being met by competition and those which are not. This may not become clear until the product is introduced, in which case the ability to redesign quickly and efficiently is critical.

The Gomory and the Kline and Rosenberg models recognize the existence of tight linkages and feedback mechanisms which must operate quickly and efficiently. These linkages must exist interfirm, intrafirm, and also between firms and other organizations, such as universities. Of course, the firm's level of vertical integration determines in part whether the required interactions are intrafirm or interfirm.

2. LINKAGES TO OTHER FIRMS

Whether innovation proceeds according to either the serial or the cyclic model, it is likely to require access to capabilities beyond the innovating entity. These capabilities may lie in universities, other parts of the enterprise, or in other unaffiliated enterprises. We now explore the role of some of these key organizational structures in both the development and the commercialization of new technology.

a. Development

In some industries, users other than the manufacturers conceive of and design prototypes with significant performance improvements.³³ The

32. S. J. KLINE AND N. ROSENBERG, *supra* note 31, at 290-91. Even the Kline and Rosenberg model does not fully reflect the cyclic nature of the new product development process. The model best describes products which represent large rather than incremental product improvements.

33. Von Hippel, *The Dominant Role of the User in Semiconductor and Electronic Subassembly Process Innovation*, IEEE TRANSACTIONS ON ENGINEERING MGMT, EM-24:2 (1977); and THE SOURCES OF INNOVATION 13 (1988).

manufacturers' role in the innovation process is to somehow become aware of the user innovation and its value, and then to manufacture a commercial version of the device for sale to user firms. This pattern of innovation involving vertical cooperation is contrary to the usual assumption that product manufacturers are responsible for the entire innovation process from finding to filling the need. The transfer from user to manufacturer may be initiated by the user, or by the manufacturer, who may have already hired individuals with experience from the user firms.

Researchers have found that user-dominated innovation accounted for more than two thirds of first-to-market innovations in scientific instruments and in process machinery used in semiconductor and electronic subassembly manufacture.³⁴ This implies that successful management of the process requires that product engineering skills (rather than R&D skills) be resident in the manufacturer, and that manufacturers search to identify user solutions rather than user needs.³⁵ A further implication of these findings is that there may be a symbiotic vertical relationship between users and equipment manufacturers which depends upon social and geographical proximity. Therefore, if user industries migrate overseas, the manufactures of equipment may disappear from the domestic scene as well.

Mirroring the role that users play in stimulating innovation upstream is the role that suppliers play in stimulating downstream innovation. For example, a good deal of the innovation in the automobile industry, including fuel injection, alternators and power steering, has its origins in upstream component suppliers.³⁶ The challenge to the manufacturer then becomes how to "design in" the new components and how to avoid sole source dependency. As discussed below, deep and enduring relationships need to be established between component developer-manufacturer and supplier to ensure adoption and diffusion of the technology.

A related set of vertical relationships involving innovation has been remarked upon by Rosenberg in his treatise on technology and American economic growth.³⁷ The machine tool industry in the nineteenth century played a unique role both in the initial solution of technical problems in user industries, such as textiles, and as the disseminator of these techniques to other industries, such as railroad locomotive manufacture. Rosenberg's description suggests that the users

34. *Id.*

35. Note that user innovation requires two kinds of technology transfer: first from user to manufacturer, and then from manufacturer to the developer-user and other users.

36. Bendix and Bosch developed fuel injection and Motorola the alternator.

37. N. ROSENBERG, TECHNOLOGY AND AMERICAN ECONOMIC GROWTH (1972).

played a role in the development of new equipment. He notes that before 1820 in the U.S., one could not identify a distinct set of firms who were specialists in the design and manufacture of machinery. Machines were either produced by users or by firms engaged in the production of metal or wooden products.³⁸ Machinery-producing firms were thus first observed as adjuncts to textile factories. However, once established, these firms played an important role as the transmission center in the diffusion of new technology.³⁹

In addition, successful new product and process development innovation often requires horizontal⁴⁰ as well as vertical cooperation. These linkages can help reduce spillovers and unnecessary duplication of research efforts. They can also assist in the definition of technical standards for systemic innovation. Horizontal linkages diminish appropriability (spillover) problems because the set of firms receiving the benefits is likely to include a greater portion of firms which have incurred R&D costs. Greater appropriability thus encourages greater investment in new technology.⁴¹

Until very recently, it has been fashionable to argue that diversity is the key ingredient of successful innovation. Unquestionably, a system of innovation that converges on just one view of possibilities is likely to close off productive avenues of inquiry. However, in a private enterprise economy without horizontal coordination and communication, there is no guarantee that diversity is achieved at the lowest cost. If firms are able to coordinate their research programs to some degree, areas of senseless duplication can be minimized without the industry converging on a single technological approach.

This is not to imply that research activity in the U.S. has not traditionally displayed some cooperative elements. Researchers have observed informal know-how trading between engineers from different companies. However, this type of cooperation occurs typically at the technical level only.⁴²

38. *Id.* at 98-99.

39. *Id.* at 102.

40. We are using horizontal and vertical in the antitrust sense.

41. This has been shown empirically. See R. Levin, A. Klevorick, *supra* note 7.

In addition, collaborative research reduces, if not eliminates, what William Norris, CEO of Control Data Corporation, refers to as "shameful and needless duplication of effort." D. David, *R&D Consortia*, HIGH TECHNOLOGY, Oct. 1985, at 42. Independent research activities often proceed down identical or near-identical technological paths. This is often wasteful and can be minimized if research plans are coordinated. Needless to say, uncertainty often requires that multiple (but not identical) technological paths be pursued simultaneously. See, e.g., R. NELSON, *supra* note 2, at ch. 2.

42. [T]rading networks appear to be formed and refined as engineers get to know each other at professional conferences and elsewhere. In the course of such contacts, an engineer builds his personal informal list of possibly useful expert contacts by making private

Until recently, the U.S. view was "no cooperation should be permitted, that it is best that we keep companies apart from one another."⁴³ Meanwhile, other countries have adopted different models. For instance, Japanese cooperative activity is ubiquitous and European efforts are growing. Those broad-scale collaboration activities in Japan and Europe have reaped manifold benefits, lessening skepticism towards collaboration.⁴⁴

b. Commercialization

Innovative new products and processes will not yield value unless they are commercialized.⁴⁵ The greatest organizational challenges arise in this area. The bulk of resource commitment occurs in this area, and it is here that U.S. shortcomings are most evident. As the Council on Competitiveness recently noted, "considerable evidence suggests that America is failing to commercialize the kinds and quality of technology that the market demands."⁴⁶

The profitable commercialization of technology requires timely access to complementary assets or services, such as manufacturing and marketing, on competitive terms. Thus, development of a new product or process is only half the battle; the innovator must find the necessary know-how to successfully commercialize his innovation.⁴⁷

The interdependence between the innovators and the complementary assets can vary tremendously. At one extreme, the complementary assets may be virtually generic, have many potential suppliers, and be relatively unimportant when compared with the technological breakthrough represented by the innovation. At the other extreme, successful commercialization of the innovation may depend on an asset that has only one possible supplier. Between these two extremes there is the

judgments as to the areas of expertise and abilities of those he meets. Later, when Engineer A encounters a difficult product or process development problem, A activates his network by calling Engineer B -- an appropriately knowledgeable contact who works at a competing (or noncompeting) firm -- for advice.

The companies observed were in the U.S. steel minimill industry. Von Hippel, *supra* note 33, at 77.

43. WILLIAM OUCHI, *THEORY Z*, (1984).

44. According to William Norris, U.S. corporations were not willing to give collaborative research a try until "these companies had the hell scared out of them by the Japanese" (Davis, *R&D Consortia: Pooling Industries' Resources*, HIGH TECHNOLOGY 42 (1985)).

45. We define commercialization activities as those which are necessary to bring the product from a prototype to a marketable commodity.

46. Council on Competitiveness, *supra* note 9.

47. See D. Teece, *Profiting from Technological Innovation*, 15 RESEARCH POLICY, 286-305 (1986). Services such as marketing, competitive manufacturing, and after-sales support are almost always needed.

possibility of "co-specialization" -- where the innovation and the assets depend on each other. An example of this is containerized shipping, which requires specialized trucks and terminals that can work only in conjunction with each other.⁴⁸

The main decision the innovator has to make regarding commercialization is the method used to access complementary assets. Although there are a myriad of possible arrangements, two types stand out. At one extreme, the innovator could integrate into (i.e., build or acquire) all of the necessary complementary assets. This will likely be unnecessary as well as prohibitively expensive because the variety of assets and expertise needed is likely to be quite large, especially for complex technologies. To produce a personal computer, for instance, a company needs expertise in semiconductor technology, disk-drive technology, networking technology, keyboard technology, and several others. No company has kept pace in all of these areas by itself.

At the other extreme, the innovator could attempt to gain access to these assets through straightforward contractual relationships (e.g., component supply contracts, fabrication contracts, distribution contracts, etc.). In many instances, contracts may suffice, although a contract does expose the innovator to various hazards and dependencies that it may well wish to avoid.

The advantages of cooperative agreements -- whereby the innovator contracts with independent suppliers, manufacturers, or distributors -- are obvious. The innovator will not have to make the initial capital expenditures needed to build or buy the assets in question. This reduces risks as well as cash requirements. Also, contractual relationships can bring added credibility to the innovator, especially if the innovator is relatively unknown while the contractual partner is established and viable. We discuss the issue of how to effectuate coordination more fully in Section III below.

48. When cospecialization occurs, complementary assets need not be characterized as either vertical or horizontal in antitrust terms. Since the assets are specialized this distinction has no meaning. Other examples of cospecialization include the commercialization of a new drug which is likely to require the dissemination of information over a specialized information channel, and computer hardware which typically requires the development of specialized software both for the operating system and for applications.

III. COORDINATION FOR INNOVATION AND ALTERNATIVE GOVERNANCE STRUCTURES

A. The Need for Strategic Coordination

A reconsideration of the role of coordination in industrial organization and technological innovation is being stimulated not by new theoretical developments in economics, but by new realities in the world marketplace. Strategic coordination among autonomous units is often important to industrial performance. To develop and commercialize new technology efficiently, it is necessary for the innovator to have informational links to the user, to developers of complementary technologies and complementary assets, and generally to prior art. This free flow of information prevents businesses from simply reinventing products and processes, and allows them to build on existing ones. Coordination and cooperation are also important means of reducing costs and spreading risk and of simultaneously appropriating the returns to innovation while diffusing technology. These linkages are technical-operational, in that they focus on the transactions necessary to get the job done, rather than the organizational structure.

Clearly, the economic prospects for innovation depend upon the size of the prospective market, the costs of supplying the market, appropriability, and the number and strength of competitors. It is the essence of a private enterprise economy that although its individual members are independent, their activities are nevertheless interrelated. Any single investment will, in general, only be profitable if the volume of competitive investment does not exceed a limit set by demand, and if the volume of complementary investment reaches the correct level.⁴⁹

In traditional economic models, the information necessary to set efficient investment levels is provided without cost to economic agents. However, these models are quite inadequate for industries experiencing rapid technological change. There is no special means in a private enterprise, market economy to ensure that investment programs are made known to all concerned at the time of their inception. Indeed, Tjalling Koopmans has been rather critical of what he calls the "overextended belief" of certain economists regarding the efficiency of competitive markets as a means of allocating resources in a world characterized by ubiquitous uncertainty.⁵⁰ This uncertainty, according to Koopmans, is primarily due to the ignorance which firms have with respect to their

49. See G. RICHARDSON, *INFORMATION AND INVESTMENT: A STUDY IN THE WORKING OF A COMPETITIVE ECONOMY* 31 (1960).

50. T. KOOPMANS, *THREE ESSAYS IN THE STATE OF ECONOMIC SCIENCE* 146 (1957).

competitors' future actions, preferences, and states of technological information. Additionally, it is the area of development and commercialization of new technology where uncertainty is highest and the need to coordinate greatest. The information-circulating function which economic theory attributes to competitive markets is quite simply not discharged in industries characterized by rapid change and global markets.

In the traditional textbook treatment of these issues, the price system somehow allows all of the necessary coordination to occur smoothly and efficiently. In the Walrasian system, innovators, together with the auctioneer, act as coordinators to bring harmony to the competitive pursuit of self interests.⁵¹ In this simple view, that seems to inform much of antitrust thinking today, the only information firms and households need is provided by the price system.

However, the informational requirements of today's innovators of technology are usually greater than that which is embedded simply in the price. If there is a shortage of a key component, innovators need to delve behind today's price increase in an attempt to examine its cause and estimate its likely duration. They typically discover through investment in information acquisition whether there is a capacity problem, a government policy intervention, a natural disaster, unexpected demand growth, or some other cause for the price increase.

Prices clearly are not sufficient signals in many cases. In the U.S. there is, however, great antitrust suspicion placed on firms if they exchange the market data on price, capacity, and plans.

When coordination is necessary, a common, though often not optimal solution is merger. One can obtain complete antitrust exemption after one consummates a legal merger; there are no antitrust strictures against information exchange and strategic coordination inside a single firm. Indeed, if this activity does not occur smoothly and efficiently, the enterprise might be considered mismanaged. However, merger creates

51. The prices of goods and services are set by the auctioneer, who adjusts them according to the Law of Supply and Demand. Given a system of prices, the excess of sales price of entrepreneurial output over the cost of production may be either positive, null, or negative. This excess is termed *benefice de l'entreprise* by Walras. A positive or negative *benefice* is a sign of disequilibrium, and entrepreneurs respond to this signal according to the Law of Cost Price; that is, they increase their scale of production when the *benefice* is positive and reduce it when the *benefice* is negative. The presumption that firms strive for higher incomes and lower losses through entry and exit is implicit. However, entrepreneurs in their purely functional roles are only catalytic agents, who accelerate combinations of atomistic factors of production only when the *benefice* is positive. Thus, in a state of equilibrium, entrepreneurs make neither profit nor loss. "Profit in the sense of *benefice de l'entreprise* . . . depends upon exceptional and not upon normal circumstances." L. WALRAS, ELEMENTS OF PURE ECONOMICS 423 (1984).

hierarchical structures that jeopardize autonomy, a critical ingredient to creativity and innovation.

To adjust for the inadequacies of information distribution via the price system, and to promote autonomy rather than merger, we believe that a much more relaxed antitrust standard should be applied with respect to discussion, exchanges, and agreements among competitors in industries experiencing rapid technological change. We find no theoretical grounds for believing that an economy that is all tooth and claw will outperform one that involves a judicious mix of tooth, claw, and intramarket and intermarket cooperation. Adam Smith's warning -- that "people of the same trade seldom meet together, even for merriment and diversion, but the conversation ends in a conspiracy against the public, or in some contrivance to raise prices"⁵² -- needs to be tempered. The difficulty of assembling all the relevant parties to effectuate an international conspiracy is an insurmountable challenge in industries experiencing rapid technological change. We see no reason why firms in industries experiencing rapid technological change should not be able to communicate, coordinate and agree on many things. Additionally, if one group of competitors are organized in a strategic group, they may, without industry cartelization, but with group coordination and cooperation, be able to compete more effectively with other firms or with other groups. To this end, we suggest a number of policy proposals which are discussed in Section VI below.

Those who have studied the plight of certain U.S. high technology industries have often explicitly recognized the need for greater coordination. For example, Michael Borrus recognizes that greater strategic coordination is needed for the U.S. microelectronics industry if it is to compete effectively in the future.⁵³ However, his solution -- the

52. 1 A. SMITH, *WEALTH OF NATIONS* 144 (1976). This did not appear to be an important part of Smith's overall thesis.

53. M. BORRUS, *COMPETING FOR CONTROL: AMERICA'S STAKE IN MICRO ELECTRONICS* 231 (1988). Borrus comments:

Almost a decade ago it was clear that Japanese producers would emerge as enduring players in the semiconductor industry, and would, as a consequence, radically alter the industry's terms of competition. Yet it has taken almost that long for U.S. firms to cooperate sufficiently to begin to devise appropriate responses. It is almost a truism that, had the industry been able to coordinate its actions strategically a decade ago, an adequate response would have been far less costly and far more likely to succeed. To accomplish such strategic coordination, the U.S. chip industry needs an ongoing analytic capacity, embedded in an electronics industry-wide institution, with the ability to carry on competitive analysis of foreign market and technology strategies, and with sufficient prestige to offer strategic direction on which planning can occur.

There is, of course, a substantial problem associated with industry-strategic planning. To assure its health, the industry needs strategic coordination short of market sharing. All U.S. industries facing international competition ought to be permitted to develop industry-wide competitive assessment capability, at least whenever the industry can demonstrate substantial involvement of foreign governments in assisting foreign competitors.

establishment of a number of holding companies for Silicon Valley firms -- implicitly endorses a merger approach to the problem.⁵⁴ While it may be better than the current fragmented structure, there are many reasons why we are skeptical of its viability. Many of these relate to the change in compensation structures and the dampening of incentives which the arrangements would imply.⁵⁵ As explained Sections V and VI below, when high technology activities are at issue, we favor altering antitrust standards to ensure that contractual agreements, alliances, and joint ventures, that would achieve strategic coordination are put on the same footing as merger.

We next examine various organizational or governance models by which the necessary coordination might take place. Following this, we examine how both technical cooperation and strategic cooperation are achieved in Europe, Japan, and the U.S. We contend that in the U.S. strategic cooperation is less advanced and that U.S. antitrust laws are biased against strategic cooperation achieved contractually (especially with respect to horizontal forms of cooperation) in favor of that achieved via merger and acquisition. Our proposals may enable much greater strategic cooperation to take place between groups of firms in an industry, thus assisting in the emergence of a form of private industrial policy in the U.S.

B. Alternative Governance Structures

As we have seen, innovation typically requires the strategic coordination of a variety of activities and a multitude of actors. At one extreme, the necessary coordination could conceivably take place via the price system (the pure market solution). At the other, it could take place inside one giant enterprise (the pure hierarchy solution), perhaps formed by a merger. Intermediate solutions involve bilateral contracts and interfirm agreements which we will call "strategic alliances."

Although sometimes defined differently, we define a strategic alliance as a bilateral transaction involving the commitment of two or more partner firms to a common goal, entailing some pooling of their resources and activities. A strategic alliance might include one or more

54. "[I]t is possible to envision chip-firm holding companies built around common manufacturing facilities. . . . R&D resources shared among the holding company's chip firms would eliminate the problem of duplication of R&D among smaller companies. The high capital costs of staying in the technology race could be shared among firms in the form of shared flexible fabrication facilities. . . . Shared facilities would permit high usage of capacity. . . . In essence, the holding company structure would gain the advantages associated with consolidation without the disadvantages associated with integration."

Id. at 233.

55. See O. WILLIAMSON, *THE ECONOMIC INSTITUTION OF CAPITALISM: FIRMS, MARKETS, RELATIONAL CONTRACTING*, ch. 6 (1985).

of the following: (1) an exclusive purchase agreement, (2) exclusionary market or manufacturing rights, (3) technology swaps, or (4) joint R&D or co-development. Thus, a strategic alliance denotes a mix of mutual control and autonomy.

A strategic alliance is clearly differentiated from an exchange transaction, such as a simple licensing agreement with specified royalties, because the latter does not have a bilateral component. In a licensing agreement, the object of the transaction is supplied by the selling firm to the buying firm in exchange for cash. A strategic alliance by definition can never have one side receiving only cash. Strategic alliances do not include mergers either, since the possession of a controlling interest, even if not exercised, denotes control rather than cooperation.

Strategic alliances can, however, involve equity swaps or minority equity investments. Strategic alliances without equity interests typically consist of contracts between or among partner firms that are nonaffiliated. Strategic alliances involving equity interests can take many forms, including minority equity holdings, consortia, and joint ventures.

Strategic alliances have increased in frequency in recent years, and are particularly characteristic of high technology industries. Joint R&D, know-how, manufacturing, and marketing alliances can be used to access complementary technologies and complementary assets. The object of the transaction, such as the development and launch of a new product, usually does not exist at the time the alliances are established.

There are thus a variety of possible mechanisms to achieve interfirm cooperation. These governance structures are summarized in Figure 1. Whether equity (joint ventures or direct links) or non-equity mechanisms are the most desirable depends on a variety of circumstances. To understand the rationale for equity participation, it is useful to note how it affects the governance of strategic relationships.

Figure 1

INTERFIRM AGREEMENTS		
	<i>NONEQUITY</i>	<i>EQUITY</i>
Exchange	short-medium term cash-based contracts	passive stock holdings for portfolio diversification
Strategic Alliance	mid-long term bilateral contracts (non cash-based)	joint venture (operating or nonoperating), consortium, minority equity holdings and cross holdings
Merger		wholly-owned affiliate or subsidiary

Equity joint ventures can be operating or non-operating entities. Operating joint ventures, the more common situation, create a separate enterprise to perform sets of agreed-upon activities on behalf of the parent companies. Non-operating joint ventures do not perform any of their own operations. Instead, they contract with their respective parents and third parties to perform the collaborative activities.

Equity joint ventures of both types perform certain governance activities. They have their own boards of directors or partnership committees, composed of representatives of the equity holders, which are of course the parent companies. The board creates a hierarchical governance mechanism that dispenses with the need for the parent companies to specify all operational contingencies ahead of time. The partners need only agree on the governing rules. Such structures can be extremely adaptive and flexible, responding to contingencies as they occur. Such agreements also align incentives and restrict opportunism.

Equity links can also be direct, rather than through a joint venture. This provides the investing firm a claim on the residuals of the firm that accepts the investment. Such equity stakes thus distribute residuals when *ex ante* contractual agreements cannot be written to specify or enforce a division of returns. If equity membership also provides board membership, higher level strategic coordination is also possible.

We contend that alliances are a useful way of organizing innovation. They are extremely common abroad, and U.S. firms often participate in strategic alliances with foreign firms. However, unless the firms are very small, there is a reluctance due to hostile U.S. antitrust laws to use these governance structures domestically. This may have

contributed to the erosion of the U.S. technological lead. It is a policy with dubious merit in today's global business environment where cartelization is nearly impossible. We contend that antitrust law should not interfere with the selection of, or experimentation with, different organizational forms and governance structures to achieve successful innovation and commercialization.

IV. INDUSTRIAL ORGANIZATION AND INNOVATION: COMPARISONS BETWEEN JAPAN, EUROPE AND THE U.S.

A. Overview

The ability of firms to develop and commercialize new technology depends not only on the firms themselves but on the infrastructure, public policies, and methods of interfirm cooperation. Systematic differences among these factors have been called national systems of innovation.⁵⁶ As Richard Nelson notes, "the last few years have been marked by a dawning recognition that these systems differ from one another in certain possibly important respects, and a growing uncertainty about how a national system ought to be structured to be most effective."⁵⁷ We contend that antitrust policy is an important component of a national system of innovation. However, it is certainly not the only component. We present a brief overview of national systems in Japan, Europe, and the U.S.⁵⁸

A comparison of national systems of innovation serves several purposes: (1) As shown above, traditional theoretical concepts are ill-suited to analyzing the process of innovation; therefore, a review of the organization of different national systems provides useful insights into innovation. (2) Due to the fact that many of the markets in which innovating firms compete are global, it is instructive to study institutional structures and policies impacting innovation in other areas of the market. (3) Because the rationale for passage of the National Cooperative Research Act of 1984 (NCRA) was, in part, to assist U.S. firms to compete internationally,⁵⁹ an examination of foreign national systems assists in evaluating extension of the Act proposed in this article.

56. This term seems to have been brought into recent currency by Chris Freeman (*see infra* note 72) in Europe and Richard Nelson (*see infra* notes 57 and 69) in the United States.

57. *See* R. Nelson, National Systems Supporting Technical Advance in Industry (unpublished manuscript) (Columbia University, May 1988).

58. Our brief treatment here owes much to R. NELSON, *infra* note 69.

59. Wright, *The National Cooperative Research Act of 1984: A New Antitrust Regime for Joint Research and Development Ventures*, 1 HIGH TECH. L.J. 133, 138 & n. 21 (1986).

In the post-war years the advanced industrial countries have pursued vastly different approaches towards the coordinated development of new products and processes. This stems partly from differences in industrial structure, and partly from differences in public policies. Japan, in particular, possesses an industrial environment in which cooperative activities flourish. Several European countries also utilize consortia for new product development. The United States exhibits the most limited cooperative efforts because, until recently, there has been little room in business ideology and in antitrust policy to harbor such activities.

In view of the emergence of global markets, we believe that ideally the appropriate governance system for antitrust should be supranational rather than national. Antitrust policies that impact domestic industries when the market is global may well harm rather than enhance national welfare. However, recognizing that a supranational competition policy is unrealistic at present, we contend that it is desirable to take steps to bring U.S. policy in line with that of other key countries. At a minimum this will involve the establishment of certain "safe harbors" in which cooperative activity will be free from antitrust challenges and uncertainties.⁶⁰

B. Japan

In Japan, cooperation and competition are inextricably linked, as is Japanese industrial policy and competition policy. At the risk of very considerable oversimplification, the Japanese strategy for industrial development over the past three decades can be characterized roughly as follows: With governmental encouragement, and with Japan's Ministry of Trade and Industry (MITI) as a catalyst, the industrial establishment has worked cooperatively to identify promising industrial technologies and avenues for development. This process has not involved MITI "picking winners," but businessmen selecting the most likely candidates for global industrial expansion. Once a consensus emerges among business and between business and government, public agencies entice and sometimes cajole firms to engage in cooperative strategies. These tactics often include cooperative R&D associations whose goal is to catch up with, or to improve upon, the existing state of industrial technologies. Once the technology is mastered, Japanese firms will then often invest in it with the object of becoming the world cost leader. At this stage, strong competition will emerge to complement earlier cooperation. Figure 2 is a simplified view of the process.

60. See *infra* notes 181-83 and accompanying text.

Contrary to the impressions that some individuals and organizations may have, Japanese success in technology development is not generally due to large amounts of public funding. As the U.S. semiconductor industry association observed, "the effectiveness of the Japanese government's activities does not come from its ability to spend public funds, for even today MITI's industrial fund is about \$2 billion. Much of what the Japanese government has done for its semiconductor industry is nonquantifiable. Its effectiveness is derived from its ability to coordinate and influence."⁶¹ Because there is no space to adequately survey the growing literature on cooperation and competition in Japan,⁶² we will simply summarize key features.

Consultation and collaboration begin far before it is publicly announced that a technology is targeted for cooperative development. In most cases an industry association initiates such discussions; less frequently, government officials take the lead.⁶³ Protracted planning and exhaustive consultation takes place at all levels among competitors, users, suppliers and government. Industry participants need not concern themselves with antitrust, because of the prevailing attitude that such behavior is procompetitive.

Sometimes collaborative research is considered to be the wisest approach. When this occurs, it is often conducted by multiple parties, and along several avenues. This is contrary to the common view that collaboration necessarily causes the parties to converge on one technological path. Rather, Japanese cooperative R&D is diverse, though not overly duplicative. Participants often work separately, in their own facilities, and at least two firms will usually be assigned to a particular element of the technology. Interbureaucratic rivalries also ensure that when consortia are used several are formed for a given technology.

Cooperative efforts are likely to be good candidates for subsidies from public funds. In 1983, a new system of public financing was established exclusively to support joint R&D so that "[t]oday four-fifths of Japanese government loans are extended to joint projects. . . . [S]ince

61. SEMICONDUCTOR INDUSTRY ASSOCIATION, *THE INTERNATIONAL MICROELECTRONIC CHALLENGE* 18 (1981).

62. Excellent treatments include: C. JOHNSON, *MITI AND THE JAPANESE MIRACLE* (1982); Anchoroguy, *Mastering the Market: Japanese Government Targeting of the Computer Industry*, 42 *INTERNATIONAL ORGANIZATION* 3 (1988); Ouchi & Bolton, *The Logic of Joint Research and Development*, 30 *CALIFORNIA MANAGEMENT REVIEW* (1988); R. Samuels, *Research Collaboration in Japan*, (MIT-Japan Science and Technology Program, Working Paper No. 87-02 1987); Anchoroguy, *COMPUTERS INC.: JAPAN'S CHALLENGE TO IBM* (1988) (unpublished book manuscript, Harvard Business School) [hereinafter *COMPUTERS INC.*].

63. T. PEPPER, M.E. JONOW, J.W. WHEELER, *THE COMPETITION: DEALING WITH JAPAN 1985*; D.L. Doane, *Two Essays on Technological Innovation: Innovation and Economic Stagnation, and Interfirm Cooperation for Innovation in Japan*, (1984) (unpublished Ph.D. dissertation, Department of Economics, Yale University).

firms must be members of designated nonprofit research consortia to qualify for these conditional loans, it is clear that the Japanese government subsidy system is disproportionately generous to joint research projects."⁶⁴ While participation in cooperative research and development is not compulsory, and indeed leading firms in an industry commonly shun joint research, the government, and especially MITI, provide strong inducements to cooperate. MITI acts simultaneously as cheerleader, champion, and coordinator.⁶⁵

It is important to note that the Japanese have rejected the model of national champions, and seem to promote cooperation among firms that are rivals. The level of cooperation fades, but does not necessarily disappear, as new products approach the point of sale. The Japanese Fair Trade Commission (FTC) does not bar cooperation during the sales process; Japanese firms simply prefer to compete.⁶⁶ However, some Japanese cooperative efforts continue right to the point of sale. For instance, in 1961 MITI helped establish, and the government helped finance, the Japan Electronic Computer Company, a corporation which served as a marketing device for the entire Japanese industry.⁶⁷

Japanese cooperative efforts have been facilitated by a permissive antitrust policy. The FTC has never held that joint R&D activities violate the Antimonopoly Act. The Japanese view joint R&D activities, which may include joint commercialization efforts, as procompetitive and thus they should not be touched by the Antimonopoly Act. The liberal Japanese antitrust environment is discussed more fully below.⁶⁸

C. Europe

Cooperation in technology development in Europe is taking a wide variety of paths through company-to-company agreements and alliances, university-industry ties as in the U.S., and publicly-funded Intra- and Pan-European consortia. The governments concerned clearly perceive a link between R&D programs funded and coordinated by government and the international competitiveness of their national economies. While the European experience differs considerably from country to country, no country's competition policy directly or indirectly impedes collaborative efforts.

64. See R. Samuels, *supra* note 62, at 36.

65. *Id.* at 38.

66. As one Japanese businessman noted, "If R&D content is too close to commercialization, cooperation will not go far." See Anchooguy (1988), *supra* note 62, at 207 (attributed to Shimizu Sakae, senior managing director of Toshiba).

67. See COMPUTERS INC., *supra* note 62.

68. See *infra* Section V.D.1.

1. FRANCE

In France, as in Japan, the government plays a major role in encouraging, guiding, subsidizing, and protecting industry.⁶⁹ Since the 1950s, France has been particularly concerned with the development of high technology industries. Rather than encouraging cooperative efforts via contract and consortia, the French approach was often to establish a national champion company supported by publicly-funded R&D. This was the case in computers and semiconductors. These entities had the dual and conflicting missions of simultaneously meeting defense procurement and civilian needs. They did neither very well.

In recent years, the French appear to have moved away from the national champion model. La Filiere Electronique, for instance, is a national plan to strengthen the competitiveness of the French electronics industry.⁷⁰ The initiative began in 1982 through the vertical and horizontal coordination of private and public resources. Most of the resources as well as the impetus for selection, direction, and coordination are coming from the Ministry of Defense. La Filiere Electronique differs significantly from Japanese, British, and EEC programs in its efforts at both industry restructuring and interindustry coordination and linkage.⁷¹

2. BRITAIN

In Britain there is a long tradition of broad governmental involvement with R&D activities. Most governmental industrial support comes from the defense budget, and most of it has been directed to specific projects (e.g., nuclear power and aircraft). Periodically, the government has also subsidized R&D projects with a view to civilian markets (e.g., computers and semiconductors).

However, in 1982 the Alvey Committee Report and the subsequent establishment of the Alvey Programme on information marked an

69. This tradition goes back to the Bourbons. See R. NELSON, *HIGH TECHNOLOGY POLICIES: A FIVE NATION COMPARISON* (1984).

70. La Filiere Electronique's breadth is remarkable: "filier," a French word for which there is no accurate one-word English translation, describes the cluster of activities related to a given technology. La Filiere Electronique thus includes components such as microprocessors, memories, consumer electronics, office equipment, computers, telecommunications, avionics, medical electronics, as well as software.

71. One observer noted: "among government companies, boundaries were redrawn to consolidate resources and establish a leader for each technical area. St. Gobain was forced out of the filiere; it sold its share of Olivetti back to Olivetti, withdrew its capital in Bull, and sold its 50 percent share of Eurotechnique to Thomson. One of the most pronounced changes in technical territory was the agreement signed between Thomson and CGE, dubbed the 'Yalta of Electronics': CGE exchanged its consumer and components division for Thomson's telecommunications division. In addition, CGE and Thomson sold their subsidiaries involved in computers to Bull, and Thomson acquired the remaining 50 percent of Eurotechnique from National Semiconductor (U.S.) as well as EFICS from CEA." R. LANGLOIS, *MICROELECTRONICS: AN INDUSTRY IN TRANSITION* 124 (1987).

important departure from this project specific support.⁷² All the projects within the program are based on a principle of interfirm collaboration supporting precompetitive research on a broad front.

The Alvey Programme has already achieved some positive results. It has been successful in creating a consensus in the scientific and technological community about priorities for information technology. Specifically, it has helped develop cooperation between university and industrial researchers. Most importantly, the project seems to be on track in terms of its technological goals. Additionally, some participating firms in British electronics and software have been stimulated and encouraged by their Alvey work to develop a long-term strategy for their R&D and product and systems development. They have become much more aware of the potential benefits from collaboration with outside organizations both domestic and abroad.⁷³

3. PAN-EUROPE

In recent years, various efforts have been mounted at Pan-European consortia. Airbus is a case in point where the cooperative activity has spanned research and marketing. This consortia is aided by heavy government subsidies. Airbus Industrie was set up under French law as a *Groupement d'Interet Economique* (GIE). For Airbus Industrie, status as a GIE offered several advantages. The GIE has no capital, makes no profit, and is fiscally transparent. Profits, risks and taxes percolate down to the member companies. Partners are joint risk takers; each is responsible for securing adequate funding from its government and is liable for the debts of the GIE under its own assets. The GIE thus helped formalize cooperation without merger of the firms involved. However, it still provided customers with a single face for sales and service. The GIE is able to accept new members, does not tie up large

72. The Alvey Programme is an important development in British R&D efforts not only because of its scale -- 350 million British pounds over six years -- but because of its guiding philosophy. The really important and radical features of the program are: (1) the clear commitment to a national strategic goal, (2) the advancement of information technology in four main areas of technology for the fifth generation of technology, (3) the rejection of the project approach for the programme method, and (4) the principal of collaboration between firms, universities, and government. See C. FREEMAN, *TECHNOLOGY POLICY AND ECONOMIC PERFORMANCE: LESSONS FROM JAPAN* (1987).

73. Review committees have also observed that the program has been particularly successful in a variety of activities, including providing a strong focal point for the information technology community to share expertise and discuss common problems. Observers also indicate awareness that a "precommercial" research and development program in itself is insufficient to affect market performance. Other cospecialized assets must also be developed and the technology must connect with user needs. Development and commercialization of technology depends not just on investment at the firm level, but on the underlying infrastructure and the quality of the nations' human capital which supply the cospecialized assets.

amounts of capital, and preserves the flexibility needed to react to changes in membership and customer demands.⁷⁴

Other precommercial activities in Europe include the European Strategic Programme for R&D in Information Technology (ESPRIT), R&D in Advanced Communications Technologies for Europe (RACE) and European Research Cooperation Agency (EUREKA). ESPRIT is a significant collaborative research effort in information technology. It was launched in 1983 by the EEC and private industry. ESPRIT focuses on long lead-time R&D related to advanced microelectronics, data and knowledge processing, and office and factory automation. The publicly articulated goals of the program reflect the view that coordinated research is a key aspect of competitiveness.⁷⁵

While it is too early to evaluate the success of ESPRIT, many government and industry participants opine that the indirect benefits of ESPRIT -- the establishment of a workable model for cooperation among research partners who had previously competed on both product and national bases -- may be even more important than the achievement of specified technical objectives.⁷⁶

D. UNITED STATES

In the United States there is no strong tradition of cooperative innovation.⁷⁷ We argue that the U.S. antitrust laws and the constraints they place on collaboration have contributed to this paucity of cooperative activity. However, in recent years there has been much greater discussion of the possible uses of collaboration to facilitate new product development and commercialization.

One reason for this new awareness is that sources of innovation are becoming dispersed worldwide. Whereas U.S. firms used to be able

74. For an excellent analysis of this and other organizational forces in European Aerospace, see Koenig & Thietart, *Managers, Engineers, and Government: The Emergence of Mutual Organization in the European Aerospace Industry*, 10 *TECHNOLOGY AND SOCIETY* 45 (1988).

75. As the European Community sees it, the main drive for such a large scale program has come from industry. Facing formidable competition from Japan and the U.S., Community industry has acknowledged that, in order to reverse the trend of increased reliance on imported technology, steps must be taken. Joint strategic long-term research planning and the concentration of resources will address the competition by: (1) ensuring that research teams achieve the critical mass to obtain results, (2) enabling optimization of resources that will result in reducing duplication and widening the spectrum of research tackled, (3) reducing the time delay caused by reliance on imported technology, and (4) paving the way to the definition and adoption of standards of European origin. R. LANGLOIS, *supra* note 71, at 116.

76. *Id.* at 119.

For a fuller discussion of the European antitrust environment, see *infra* Section V.D.2.

77. That is not to say that there is not a significant number of collaborative arrangements in the U.S. involving domestic and foreign firms. One particular form of collaboration, the joint venture, has been of historical importance in extractive industries such as aluminum and oil and gas. J.S. STUCKEY, *VERTICAL INTEGRATION AND JOINT VENTURES IN THE ALUMINUM INDUSTRY* (1983).

to "go it alone," they increasingly can no longer do so. Even if they have the financial resources, the sources of technology and the assets needed for profitable commercialization now often lie outside the firms' boundaries and outside the nation's boundaries. Thus, many industries in the last decade or so have engaged in significant collaborative efforts with partners, particularly foreign partners.

For a brief period, approximately 1945-1970, the U.S. was the world technological leader across a very broad front of industrial technologies. Both historical and organizational factors were recognized as lying behind U.S. technological primacy, and the U.S. system generated widespread envy and emulation in other Western countries. The largest portion of R&D was performed in-house in private laboratories oriented toward products and processes for in-house commercialization. In the U.S., virtually all of the work oriented toward civilian markets was, and still is, privately funded.

Almost all military R&D was privately performed but funded by defense department contracts. While these contracts were tightly tied to Department of Defense (DOD) procurement needs, a number of the technologies involved had significant civilian spillovers. The result was that capabilities developed by American corporations engaged in military R&D programs gave them a significant advantage over their foreign competitors in industrial technologies such as those required for civilian jet aircraft (including engines), computers, and semiconductors.⁷⁸

Universities were crucial to the U.S. system and remain important today. After World War II, the government increasingly accepted the responsibility for funding basic R&D, much of it university based. This took place not just through the National Science Foundation (NSF), but also through mission-oriented agencies such as the National Institutes of Health (NIH) and the DOD.

The hallmark of the U.S. system throughout the post-war period has been its autonomy and absence of coordination either by government or by industry. Many government agencies provide funding to universities, and a few to industry, but there has been a virtual absence of higher order governmental coordination. An absence of coordination also characterizes private sector R&D, except of course intracorporation activity. Individual companies go their own way, with only a limited amount of cooperation compared to Japan and Europe.

78. These spillovers were not in any sense the primary goal of military R&D; in practically all cases they were a fortuitous corollary. Indeed, as Nelson points out, the ideological strictures against government funding of civilian R&D were quite strong, even though there were brief but expensive dalliances with the S.S.T. and nuclear power. R. NELSON, *supra* note 69.

Due to the integrated nature of many U.S. industries, interfirm collaboration has been a lesser imperative than in countries and industries where there is more fragmentation.⁷⁹ In sum, coordination in the U.S. has commonly been an administrative affair taking place inside large firms.

However, in the late 1970s and early 1980s, some new and interesting forms of cooperative activity began to emerge. In microelectronics, for instance, the formation of two new cooperative arrangements are noteworthy. The Semiconductor Research Corporation (SRC) was formed to pursue basic and applied research, and the Microelectronics and the Computer Technology Corporation (MCC) was formed to pursue VLSI technology and related product development.

The goal of SRC is not product development. It has both near (three-to five-year) and medium (five-to ten-year) time horizons and seeks to involve the universities directly to generate useful findings and to support the development of faculty and student skills. The idea is to reduce costs and risks through coordination and the elimination of unnecessary duplication. Both the SRC and MCC were a response, albeit a very small one, to Japanese competition.

A more substantial response to Japanese competition is Sematech, the Semiconductor Manufacturing Technology Initiative. This cooperative venture "represents the kind of infrastructural innovation needed to preserve the possibility of the merchant's survival."⁸⁰ It is an industry-wide consortium with partial government (DOD) funding. Its objective is to improve the process technologies of U.S. semiconductor firms. Its members are not just the chip fabricators and the electronic systems captives, but also the semiconductor tooling and materials suppliers through their Semiconductor Equipment and Materials Institute (SEMI). Sematech will focus on the development and on-site demonstration of generic process technologies, products relevant to the entire industry. New process technologies will supposedly be transferred back to member companies and other businesses for adaptation to their own facilities. The cooperation structured through Sematech would replicate the wide resource and skill base available now only to larger integrated U.S. firms, like IBM, and the large integrated Japanese electronics giants.⁸¹ By

79. Interestingly, cooperation is of relatively minor importance in pharmaceuticals (an industry with tight appropriability), of growing importance in aircraft and integrated circuits, and of great importance in biotechnology. Clearly, there are large differences across industries and among firms. For an excellent survey of collaborative and joint venture activities, see D. MOWERY, *INTERNATIONAL COLLABORATIVE VENTURES IN U.S. MANUFACTURING* (1988). See also *supra* notes 22-24 and accompanying text.

80. BORRUS, *supra* note 53, at 217.

81. There is no guarantee that the merchants will have the competitive wherewithal to make use of the available technology. Successful use will depend on a range of other variables, including: (1) overall strategic market orientation, (2) the quality of management and personnel, (3) the

creating a common technology base, Sematech sponsors hope that the resource and size advantages of Japanese firms can be neutralized as determinants of competitive position in the market. If successful, Sematech will enhance the viability of the nonintegrated, smaller merchant firms, thus sustaining continued product innovation and technology diffusion in the U.S. economy as a whole.

In short, the rising costs of new product development, pluralism in the sources of new technology, and shorter product life cycles are favoring organizations with significant assets. Yet, the need to remain quick footed in development and design favors smaller business units. New and creative governance structures need to be put in place to meet the competitive challenge and to overcome the disadvantages of fragmented industrial structures. Many forms of complex contracting and alliance building are unnecessarily impeded by antitrust laws in the U.S. The result is that cooperation is not as broad and deep as it ought to be, and second best solutions like mergers are chosen instead. Thus, the possibilities afforded by cooperation in new product development and commercialization are never realized.

V. IMPACT OF ANTITRUST LAW ON ALLIANCES TO FACILITATE INNOVATION

Current U.S. antitrust law needlessly inhibits strategic alliances designed to develop and commercialize new technology. This occurs predominantly in two ways. First, the legal standards for strategic alliances are not as clear as for mergers. While it is generally true that rule of reason analysis -- rather than per se rules -- will be applied to contractual arrangements designed to advance innovation, the elements of rule of reason analysis are quite muddled. Some clarity exists in the area of vertical relationships, but serious ambiguities still remain. The greatest uncertainty concerns horizontal and hybrid (elements of both vertical and horizontal relationships) cooperative arrangements, where such activities may be characterized by the courts as cartelization. In cases where the parameters of rule of reason analysis are ambiguous and unstructured, the result is in uncertainty and unpredictability for potential alliance partners.

Second, antitrust law permits private plaintiffs to engage in treble damage litigation against cooperative arrangements. The exposure to treble damages for entering into strategic alliances that might later be found by a jury to constitute an unreasonable restraint of trade remains a powerful disincentive to cooperation.

level of innovation of design capabilities, and (4) successful integration of the available technology into production.

These substantive and procedural obstacles to cooperative innovation were articulated at congressional hearings on the need for new legislation:

[The] more important reason for the lack of cooperation in U.S. research and development, however, is the widespread fear of inadvertently violating our century-old "antitrust" laws, even though they ignore current economic realities and promote inefficiency in the name of antitrust enforcement. Many companies are deeply concerned that the Justice Department or the courts will interpret "cooperation" to mean "conspiracy" -- even in R&D -- and that they will therefore be exposed to large treble damages awards.

Even though research consortia are typically completely lawful, the uncertainties in the interpretation and application of U.S. antitrust laws are a major obstacle to pooling resources in research and development, very little official guidance exists as to what constitutes a lawfully structured joint R&D venture or what conduct will ultimately be considered lawful by the courts.⁸²

Congress responded by passing the National Cooperative Research Act of 1984. While Congress should be applauded for its initial effort in this area, it is now clear that the Act fails to address fully the needs of innovation, and hence has not generated the hoped for response from private business.

This section will describe the U.S. antitrust environment for cooperative innovation, and, in the last part, will compare Japan's and the European Community's more favorable legal environment. In the following section, we advance a number of proposals to revise the current antitrust system to allow businesses to compete more effectively by cooperating through strategic alliances for the development and commercialization of new technology.

82. *Japanese Technological Advances and Possible U.S. Responses Using Research Joint Ventures: Hearings Before the Subcomm. on Investigations and Oversight and the Subcomm. on Science, Research and Technology of the H.R. Comm. on Science and Technology, 98th Cong., 1st Sess. 23-24 (1983)* (statement of J. Lacey, Executive Vice President for Technology and Planning, Control Data Corp.). See also *The National Productivity and Innovation Act and Related Legislation: Hearings on S.1841 and on S.568, S.737, and S.1383 Before the Senate Comm. on the Judiciary, 98th Cong., 1st and 2d Sess. 50 (1983-84)* (statement of W. C. Norris concerning the confusion and uncertainty surrounding antitrust enforcement and the threat of private treble damage actions even in cases in which the government has "cleared" a cooperative arrangement); Davis, *supra* note 44; Pollack, *Uniting to Create Products: Imports Spur Joint Products*, N.Y. Times, Jan. 14, 1986, at D1, col.2.

A. Rule of Reason Analysis of Strategic Alliances and Cooperative Innovation Arrangements Is Ambiguous and Unpredictable

1. CURRENT RULE OF REASON STANDARDS

In *Standard Oil Co. v. United States*,⁸³ the Supreme Court interpreted Section 1 of the Sherman Act to prohibit agreements that are "unreasonably restrictive of competitive conditions."⁸⁴ Eventually the Court came to hold that certain agreements were so plainly anticompetitive and lacking in any redeeming virtue that they should be held "per se" illegal without further inquiry into reasonableness.⁸⁵ This conclusive presumption of illegality was applied to many agreements, including horizontal and vertical price-fixing,⁸⁶ horizontal territory or customer division,⁸⁷ and boycotts of customers and suppliers⁸⁸ -- cases in which, the Court believed, "surrounding circumstances make the likelihood of anticompetitive conduct so great as to render unjustified further examination of the challenged conduct."⁸⁹ Per se rules thus apply to "naked" restraints that raise price or reduce output, while failing to create efficiencies or facilitate productivity.⁹⁰

Rule of reason analysis applies to all agreements not included in the per se illegal category. Beginning in the area of nonprice vertical restraints, with *Continental T.V., Inc. v. G.T.E. Sylvania, Inc.*,⁹¹ and broadening into the area of horizontal agreements, with *Broadcast Music, Inc. v. Columbia Broadcasting System*,⁹² *National Collegiate Athletic Association v. Board of Regents of the University of Oklahoma*,⁹³ *Northwest*

83. 221 U.S. 1 (1911).

84. *Id.* at 58.

85. *See, e.g.*, *National Soc'y of Professional Eng'g's v. United States*, 435 U.S. 679, 692 (1978); *Northern Pac. Ry. Co. v. United States*, 356 U.S. 1, 5 (1958); *United States v. Socony-Vacuum Oil Co.*, 310 U.S. 150, 218, 224 n.59 (1940); *United States v. Trenton Potteries Co.*, 273 U.S. 392, 397-98 (1927).

86. *Continental T.V. Inc. v. G.T.E. Sylvania, Inc.*, 433 U.S. 36, 51 n.18 (1977); *Kiefer-Stewart Co. v. Joseph E. Seagram & Sons, Inc.*, 340 U.S. 211 (1951); *United States v. Socony-Vacuum Oil Co.*, 310 U.S. 150 (1940); *Dr. Miles Medical Co. v. Park & Sons Co.*, 220 U.S. 373 (1911).

87. *United States v. Topco Assocs.*, 405 U.S. 596 (1972); *United States v. Sealy, Inc.*, 388 U.S. 350 (1967); *Northern Pac. Ry. Co. v. United States*, 356 U.S. at 5.

88. *Northwest Wholesale Stationers, Inc. v. Pacific Stationery & Printing Co.*, 472 U.S. 284, 290, 294 (1985); *Klor's, Inc. v. Broadway-Hale Stores, Inc.*, 359 U.S. 207 (1959); *Fashion Originators' Guild of America, Inc. v. Federal Trade Comm'n*, 312 U.S. 457 (1941).

89. *NCAA v. Board of Regents of the Univ. of Okla.*, 468 U.S. 85, 103-104 (1984).

90. *Broadcast Music, Inc. v. Columbia Broadcasting System*, 441 U.S. 1, 19-20 (1979) (quoting *United States v. United States Gypsum Co.*, 438 U.S. 422, 441 n.16 (1978)) (rule of reason should be applied to practices designed to "increase economic efficiency and render markets more, rather than less, competitive."); *Continental T.V. v. G.T.E. Sylvania Inc.*, 443 U.S. 36, 51 n.18 (1977).

91. 433 U.S. at 36. For the Court's most recent statement concerning vertical restraints, see *Business Elects. Corp. v. Sharp Elects. Corp.*, ___ U.S. ___, 108 S. Ct. 1515 (1988).

92. 441 U.S. 1 (1979).

93. 468 U.S. 85 (1984).

Wholesale Stationers, Inc. v. Pacific Stationery & Printing Co.,⁹⁴ and *Federal Trade Commission v. Indiana Federation of Dentists*,⁹⁵ the Court has applied rule of reason analysis to cooperative arrangements that have the potential of producing integrative efficiencies, a new market, or other procompetitive benefits.⁹⁶ In the Court's view, unless a "practice facially appears to be one that would always or almost always tend to restrict competition and decrease output,"⁹⁷ the agreement should be analyzed under the rule of reason.⁹⁸ Although none of these recent Supreme Court cases have involved innovation, the opinions permit a confident conclusion that rule of reason analysis rather than per se illegality should apply if there is a plausible claim that cooperation is needed for innovation and its commercialization.⁹⁹ Such cooperation permits significant efficiencies and contains obvious procompetitive potential by creating new markets and permitting firms to compete on an equal footing in the world market.

94. 472 U.S. 284 (1985)

95. 476 U.S. 447 (1986).

96. See, e.g., Halverson, *The Future of Horizontal Restraint Analysis*, 57 ANTITRUST L.J. 33 (1988); Sullivan, *The Viability of the Current Law on Horizontal Restraints*, 75 CALIF. L. REV. 835 (1987); Zelek, Stern, & Dunfee, *A Rule of Reason Decision Model After Sylvania*, 68 CALIF. L. REV. 13 (1980); Comment, *The Sullivan Approach to Horizontal Restraints*, 75 CALIF. L. REV. 893, 913-15 (1987).

It is not surprising that the Court would move away from per se illegality as its understanding of economics and business behavior advances. Where economic theory and business experience suggest that certain practices will not "always or almost always tend to restrict competition and decrease output," per se analysis is not appropriate. *Broadcast Music, Inc. v. Columbia Broadcasting System*, 441 U.S. at 19-20. Of course, as courts gain more experience with cooperative arrangements among competitors, they may eventually decide that certain practices should return to a per se illegality category. See Remarks of Spivack in *Panel Discussion: Directions of Antitrust*, 57 ANTITRUST L.J. 83, 95-96 (1988) (suggesting that courts will eventually hold per se illegal all agreements to fix sales prices, except where the agreement on price is necessary to market a product).

97. *Broadcast Music, Inc. v. Columbia Broadcasting System*, 441 U.S. at 19-20.

98. The most recent Supreme Court decision recognizing the benefits of cooperation is *Business Elects. Corp. v. Sharp Elects. Corp.*, ___ U.S. ___, 108 S. Ct. 1515 (1988) ("support for the cartel-facilitating effect of vertical nonprice restraints was and remains lacking.").

99. In *Berkey Photo, Inc. v. Eastman Kodak Co.*, 603 F.2d 263 (2d Cir. 1979), the Second Circuit applied rule of reason analysis rather than per se rules to cooperative innovation and product development agreements, specifically rejecting the plaintiff's request for a per se jury charge. *Id.* at 302. Nevertheless, the court recognized that such agreements may be unreasonably restrictive, particularly when one of the parties has significant market power, and affirmed the jury's verdict that Kodak's separate joint development agreements with Sylvania and GE concerning magicube and flipflash products unreasonably restrained trade in violation of Section 1 of the Sherman Act. *Id.* For criticism of *Berkey's* handling of cooperative innovation, see Langenfeld and Scheffman, *Innovation and U.S. Competition Policy* EUROPEAN TECHNOLOGY INITIATIVES: CORPORATE AND PUBLIC PERSPECTIVES ON COOPERATIVE R&D IN HIGH TECHNOLOGIES (forthcoming in 1989).

See also U.S. Department of Justice, *Antitrust Enforcement Guidelines for International Operations* 22 (1988) reprinted in 54 Antitrust & Trade Reg. Rep. (BNA), No. 1369, at S-23 (1988); U.S. Department of Justice, *Antitrust Guidelines Concerning Research Joint Ventures* 3 (1980); Sullivan, *supra* note 96 at 842-44 (1987); Brodley, *Joint Ventures and Antitrust Policy*, 95 HARV. L. REV. 1523, 1571-72 (1982); Ginsburg, *Antitrust, Uncertainty, and Technological Innovation*, 24 ANTITRUST BULLETIN 635, 672 (1979).

2. PROBLEM AREAS IN RULE OF REASON ANALYSIS.

The fact that rule of reason, rather than per se rules, will apply to strategic alliances for innovation does not mean that this area of antitrust law is problem-free. Substantial uncertainties remain concerning the content and order of rule of reason analysis,¹⁰⁰ as we discuss below.

a. The Characterization of Integrative Efficiencies May Be Uncertain

When potential for integrative efficiencies exists, a court should apply rule of reason analysis to restraints found in an agreement. However, determining the presence of integrative efficiencies may sometimes be a difficult task. For example, in *Arizona v. Maricopa County Medical Society*,¹⁰¹ the Supreme Court found no integrative efficiencies in a maximum fee-limit agreed upon by physicians; a "quick look" at the arrangement, in the majority's view, justified a finding of per se illegality.¹⁰² However, as the dissent argued, the agreement could be viewed as procompetitive, enabling insurers to control total costs.¹⁰³ The

100. See, e.g., *Assam Drug Co. v. Miller Brewing Co., Inc.*, 798 F.2d 311, 315 (8th Cir. 1986) ("The vertical nonprice restraint at issue in this case is plainly subject to evaluation under the rule of reason [citing *Continental T.V., Inc. v. G.T.E. Sylvania, Inc.*, 433 U.S. 36 (1977)]. The rule of reason, however, is a vacuous standard and as such it provides little concrete direction for evaluating the competitive effects of a challenged restraint."); *Graphic Prods. Distribs. v. Itek Corp.*, 717 F.2d 1560, 1568 n.10 (11th Cir. 1983) ("Not called upon to apply the rule of reason to the facts at hand, the [Sylvania] Court merely recited the classical articulation of the rule by Justice Brandeis in *Chicago Bd. of Trade v. United States*, 246 U.S. 231 (1918). The exceedingly general nature of these factors, and the absence of an analytical framework for applying the rule of reason, has been discussed by commentators of every persuasion. [references omitted]"); *Valley Liquors, Inc. v. Renfield Importers, Ltd.*, 678 F.2d 742, 745 (7th Cir. 1982) ("The plaintiff in a restricted distribution case must show that the restriction he is complaining of was unreasonable because, weighing effects on both intrabrand and interbrand competition, it made consumers worse off. Admittedly, this test of illegality is easier to state than to apply. . . .").

Numerous commentators have reached the same conclusion. See, e.g., Zelek, Stern, & Dunfee, *supra* note 96 at 14 ("[N]either *Sylvania* nor previous decisions offer much practical guidance to lawyers who must advise clients or to judges who must decide cases under the rule of reason, leaving the question of what analytical methods are appropriate largely unresolved."); Sullivan, *supra* at 843 (In *Broadcast Music*, "the majority gives little guidance for balancing efficiency and harm once the record is expanded."); Arthur, *Farewell to the Sea of Doubt: Jettisoning the Constitutional Sherman Act*, 74 CALIF. L. REV. 263 (1986); Clark, *Antitrust Comes Full Circle: The Return to the Cartelization Standard*, 38 VAND. L. REV., 1125, 1131 (1985) ("In practice, . . . the Rule of Reason has provided little coherency or guidance."); Easterbrook, *The Limits of Antitrust*, 63 TEX. L. REV. 1, 10 (1984) (simplicity of per se rule has been undercut by requirement of showing of absence of procompetitive benefits to qualify for per se condemnation); Brodley, *Joint Ventures and Antitrust Policy*, 95 HARV. L. REV. 1523, 1535 (1982) (Under rule of reason, "the ultimate question remains of such broad scope and generality that little predictive guidance is possible. The ultimate legal result continues to turn on judicial characterization of a complex factual transaction, a situation that leads to uncertainty and costly proceedings."); Ginsburg, *supra* note 99 at 674 ("the published sources of guidance to business people and their lawyers planning joint R&D ventures provide little basis upon which to plan with confidence that no adverse antitrust consequence will ensue.").

101. 457 U.S. 332 (1982).

102. *Id.* at 351 ("[t]he anticompetitive potential inherent in all price-fixing agreements justifies their facial invalidation even if procompetitive justifications are offered for some.").

103. *Id.* at 359-61 (Powell, J., dissenting).

important point is not which view was correct; there was fair room for disagreement.¹⁰⁴ Rather, *Maricopa* demonstrates that assessing the existence of efficiencies is a process without clear guidelines for determinations.

As long as there is ambiguity in the law concerning the importance of cooperative arrangements designed to facilitate and promote innovation and the commercialization of innovation, the possibility exists that a court might take *too quick* a look and characterize a cooperative arrangement as a naked restraint warranting per se illegality treatment. The possibility for such an error is increased when courts do not appreciate the special needs innovating firms may have to insure appropriability and achieve commercialization. Competitors who guess wrong about how a cooperative arrangement will be characterized may well find themselves judged under per se rules, which provide no opportunity to demonstrate procompetitive efficiencies. Such a wrong guess, particularly in the context of treble damage litigation, can be very costly.

b. The Role of Market Power is Unclear.

(1) *Market power and per se rules*

In *Pacific Stationery*, the Court states that

unless the cooperative possesses *market power* or exclusive access to an element essential to effective competition, the conclusion that expulsion [from the cooperative] is virtually always likely to have an anticompetitive effect is not warranted. . . . Absent such a showing with respect to a cooperative buying arrangement, courts should apply a rule of reason analysis.¹⁰⁵

In other words, the Court seems to suggest that possession of market power may be a reason to apply per se rules instead of the rule of reason.¹⁰⁶

In our view, the possession of market power should be irrelevant to the question of whether per se or rule of reason analysis should be applied, because market power does not eliminate the potential for integrative efficiencies. Market power should be an important consideration in analyzing cooperative strategic alliances and arrangements among

104. Compare *Leffler, Arizona v. Maricopa Medical Society; Maximum-Price Agreements in Markets with Insured Buyers*, 2 SUP. CT. ECON. REV. 187 (1983), with *Arthur, supra* note 100 at 355-58 (1986) and *Easterbrook, Maximum Price Fixing*, 48 U. CHI. L. REV. 886 (1981).

105. *Northwest Wholesale & Stationers, Inc. v. Pacific Stationery & Printing Co.*, 472 U.S. 284, 296-97 (1985) (emphasis added).

106. A similar approach appears to have been taken in *Jefferson Parish Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 26-27 (1984), where the Court seemed to use a market power test as a dividing line between per se illegality and rule of reason analysis, holding that only proof that the defendant possesses a "dominant market position" would justify per se condemnation of a tie-in.

competitors, but the proper place for analysis is within the rule of reason.¹⁰⁷

(2) *A market-power-based safe harbor*

The relationship between ability to harm competition and possession of substantial market power is obvious. Firms lacking substantial market power act against their own self-interest when they raise prices, reduce output, or otherwise restrain trade. The marketplace itself will discipline such misguided efforts as buyers switch to substitutes or new sources of supply enter the market; antitrust law is not needed to police the restraints and maintain competition,¹⁰⁸ especially in industries experiencing rapid technological change.

The Supreme Court has recognized that market power is probative, under rule of reason analysis, of whether an agreement is likely to have anticompetitive effects.¹⁰⁹ However, the Court has not yet stated whether there should be a "safe harbor" in rule of reason analysis for firms that do not possess significant market power.¹¹⁰ The Court's failure in this regard deprives such firms of the important ability to predict whether contemplated cooperative activities will result in exposure to antitrust liability and treble damages.

107. Justice O'Connor's concurring opinion in *Jefferson Parish Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, reaches the same conclusion. Justice O'Connor argues that all tying arrangements, by virtue of their inherent procompetitive potential, should be subjected to the rule of reason, and that a market power safe harbor should be an element of rule of reason analysis rather than the per se rule of reason division. *Id.* at 33-35.

108. Naked restraints on price and output are treated as per se illegal, without analysis of market power, because they offer no redeeming efficiencies or procompetitive virtues.

109. In *FTC v. Indiana Fed'n of Dentists*, 476 U.S. 447, 460 (1986), the Court said that "the purpose of the inquiries into market definition and market power is to determine whether an arrangement has the potential for genuine adverse effects on competition. . . ." In *NCAA v. Board of Regents of the Univ. of Okla.*, 468 U.S. 85 (1984), the Court affirmed the rule of reason finding that the NCAA possessed substantial market power in a relevant market.

110. To date, the Supreme Court has neither endorsed nor foreclosed the market-power-based safe harbor approach. While the Court has stated that "the absence of proof of market power does not justify a naked restriction on price or output," *NCAA*, 468 U.S. at 109-10; *Indiana Federation of Dentists*, 476 U.S. at 460, in our view, the Court's own words and the facts in recent cases do not foreclose a market-power-based safe harbor approach. See, e.g., *R.C. Dick Geothermal Corp. v. Thermogenics, Inc.*, 827 F.2d 407 (9th Cir. 1987); 1987-2 Trade Cas. (CCH) § 67,691 (1987) (1987 U.S. App. LEXIS 11681) (opinion withdrawn pending rehearing); *In The Matter of The Arbitration Between First Tex. Sav. Ass'n and Fin. Interchange, Inc.*, Antitrust and Trade Reg. Rep. (BNA) 55, at 340 (Aug. 25, 1988). First, the Court has only condoned dispensing with proof of market power for naked price and output restraints, and thus appears to have been addressing only restraints so pernicious and without redeeming virtues that per se analysis is almost warranted. Second, in each case in which it has declined to require proof of market power, the Court has found specific evidence of anticompetitive effects, *NCAA*, 468 U.S. at 106-08; *Indiana Federation of Dentists*, 476 U.S. at 460-61, and held that in such instances "proof of actual detrimental effects, such as a reduction of output, can obviate the need for an inquiry into market power, which is but a surrogate for detrimental effects." *Indiana Federation of Dentists*, 476 U.S. at 460-61 (quoting 7 P. AREEDA, ANTITRUST LAW 1511, (1986)). Third, in each case the Court has found that the defendants possessed market power anyway. *Id.* at 460.

The Courts of Appeal have not waited for the Supreme Court. The move toward a market-power-based safe harbor can be seen most clearly in cases involving vertical relationships, where the lack of substantial market power has been used to screen out numerous challenges to vertical restraints.¹¹¹ More recently, courts have begun to apply a market-power-based screen in horizontal cases, holding that under rule of reason analysis, plaintiffs must first establish that cooperating defendants possess substantial market power.¹¹² For example, in *Polk Bros.*,

111. See, e.g., *Ryko Mfg. Co. v. Eden Servs.*, 823 F.2d 1215, 1231-32 & n.14 (8th Cir. 1987), cert. denied, ___ U.S. ___, 108 S. Ct. 751 (1988) ("[W]e agree with the approach adopted by other circuits requiring at the threshold that the plaintiff attacking a vertical nonprice restraint prove the defendant's substantial market power in a relevant market. . . . [U]nless the plaintiff can demonstrate an 'actual detrimental effect' on competition (which in a meaningful sense demonstrates the defendant's market power), the threshold market power requirement mitigates an otherwise 'unlimited inquiry' necessary under the rule of reason. [citing *Assam Drug*.]"); *Assam Drug Co. v. Miller Brewing Co.*, 798 F.2d 311, 315, 317 (8th Cir. 1986) ("Because a showing of market power is a threshold requirement to challenging a vertical nonprice restraint, a defendant who establishes, in accordance with the rules governing summary judgment, that it lacks market power a fortiori establishes that no genuine issue of material fact exists and is entitled to entry of judgment in its favor as a matter of law."); *Hand v. Central Trans., Inc.*, 779 F.2d 8, 11 (6th Cir. 1985) ("A defendant must have market power before its conduct [an alleged tying arrangement] can be shown to have adverse effect on competition."); *Graphic Prods. Distribs. v. Itek Corp.*, 717 F.2d 1560, 1568 n.10 (11th Cir. 1983) ("We have narrowed the broad-ranging inquiry called for by the rule of reason by insisting, at the threshold, that a plaintiff attacking vertical restrictions establish the market power of the defendant."); *Davis-Watkins Co. v. Service Merchandise*, 686 F.2d 1190, 1202 (6th Cir. 1982), cert. denied, *Service Merchandise Co. v. Amana Refrigeration, Inc.*, 466 U.S. 931 (1984) ("Without market power, a firm cannot have an adverse effect on competition."); *Valley Liquors, Inc. v. Renfield Importers, Ltd.*, 678 F.2d 742, 745 (7th Cir. 1982) ("A firm that has no market power is unlikely to adopt policies that disserve its customers; it cannot afford to. . . . Even if there is some possibility that the distribution practices of a powerless firm will have a substantial anticompetitive effect, it is too small a possibility to warrant trundling out the great machinery of antitrust enforcement."); *Muenster Butane, Inc. v. Stewart Co.*, 651 F.2d 292, 298 (5th Cir. 1981) ("A requirement that plaintiff prove market power in this case would have saved the litigants and the courts much expense."). See also *O.S.C. Corp. v. Apple Computer, Inc.*, 601 F.Supp. 1274, 1291 n.8 (C.D. Cal. 1985), aff'd, 792 F.2d 1464 (9th Cir. 1986) ("Absent significant market power, a vertical restriction is reasonable as a matter of law.")

112. See, e.g., *General Leaseways, Inc. v. National Truck Leasing Ass'n*, 744 F.2d 588, 596 (1984) ("With Rule of Reason becoming a more popular rule of decision in the wake of *Sylvania*, some progress has been made toward giving it some structure by requiring that the plaintiff first prove that the defendant has sufficient market power to restrain competition substantially."); *Rothery Storage & Van Co. v. Atlas Van Lines, Inc.*, 792 F.2d 210, 217 (D.C. Cir. 1986); ("Analysis might begin and end with the observation that Atlas and its agents command between 5.1 and 6% of the relevant market, which is the interstate carriage of used household goods. It is impossible to believe that an agreement to eliminate competition within a group of that size can produce any of the evils of monopoly.") cert. denied, 479 U.S. 1033 (1987) (Bork, J.); *R.C. Dick Geothermal Corp. v. Thermogenics, Inc.*, 827 F.2d 407 (9th Cir. 1987) 1987 U.S. App. LEXIS 11681; (opinion withdrawn pending rehearing). The Court stated:

In the first step [of rule of reason analysis], the claimant must demonstrate that the conspirators had significant market power. . . . If a group of firms has no market power, it usually will have neither the incentive nor the ability to reduce output below competitive levels or raise prices above competitive levels. . . . Market power is therefore an invaluable tool for evaluating the ability of an agreement between firms to cause substantial harm to competition.

Under the market power test, once the claimant proves market power, it must as a second step show that -- in light of the defendants' market power and the actual anticompetitive repercussions of the conspiracy -- the negative aspects of the conspiracy outweigh the positive aspects.

Inc. v. Forest City Enterprises, Inc.,¹¹³ the Seventh Circuit upheld a non-competition agreement between two dealers who cooperated to develop and occupy a large building that housed the independent operations of both businesses, stating:

Cooperation is the basis of productivity. It is necessary for people to cooperate in some respects before they may compete in others, and cooperation facilitates efficient production. . . . When cooperation contributes to productivity through integration of efforts, the Rule of Reason is the norm. . . . *The first step in any Rule of Reason case is the assessment of market power.* . . . Unless the firms have the power to raise price by curtailing output, their agreement is unlikely to harm consumers and it makes sense to understand their cooperation as benign and beneficial.¹¹⁴

Applying the rule of reason and finding no evidence of market power, the court reversed the district court's judgment of per se illegality.

Under the safe harbor approach to rule of reason analysis that we advance, if plaintiffs fail to prove substantial market power, defendants' cooperative efforts fall within a market-power-based safe harbor, warranting no further antitrust analysis.¹¹⁵ The adoption of a market power threshold -- a burden on plaintiffs to demonstrate that defendants possess substantial market power in a relevant horizontal, upstream, or downstream market -- clarifies legal treatment of cooperative arrangements by creating an objective test by which firms can prospectively gauge the legality of their plans. A market-power-based safe harbor approach will also bring analysis of cooperative arrangements into

Massachusetts Board of Registration in Optometry, Trade Reg. Rep. (CCH) (22, at 555 (1988) ("if the restraint is not inherently suspect, then the traditional rule of reason, with attendant issues of market definition and power, must be employed," *Id.* at (22-243); In The Matter of the Arbitration Between First Tex. Sav. Ass'n and Fin. Interchange, Inc., 55 Antitrust and Trade Reg. Rep. (BNA) at 340, 350 (Aug. 25, 1988) ("As part of its initial burden, claimant must establish that respondent possesses market power, i.e., some power to affect price and output. While *NCAA* and *Indiana Federation of Dentists* may appear to hold otherwise, both were cases in which market power was actually found. . . . *The prevailing view is that a showing of market power is necessary in rule of reason cases, at least in cases involving joint ventures or other horizontal integrations.* Dismissal of plaintiff's case in [*Nabanco v. Visa U.S.A., Inc.*, 779 F.2d 592 (11th Cir. 1986)] was based in large part on its failure to establish that VISA possessed power in a relevant market.").

113. 776 F.2d 185 (7th Cir. 1985) (Easterbrook, J.) (citing *General Leaseways, Inc. v. National Truck Leasing Ass'n*, 774 F.2d 588, 596 (1984)).

114. *Id.* at 188, 191 (case citations omitted) (emphasis added).

115. The Department of Justice has expressly endorsed a safe harbor approach when evaluating cases under rule of reason standards. See U.S. DOJ, *Antitrust Enforcement Guidelines for International Operations*, *supra* note 99, at S-10 ("First, the Department takes a 'quick look' at the degree of concentration in the relevant markets, and at the market shares of firms employing the restraint to determine whether the restraint could plausibly have an anticompetitive effect.").

alignment with the approach taken in merger analysis and articulated in the Department of Justice's Merger Guidelines.¹¹⁶

The steps taken by several lower courts are clearly in the right direction. However, uncertainty will remain until the Supreme Court or Congress specifically adopts a market-power-based safe harbor approach to rule of reason analysis and specifies its parameters.¹¹⁷ For example, there is still a good deal of uncertainty and unevenness concerning what the market power threshold should be and how it should be measured and expressed. This uncertainty is greatest in cases involving horizontal arrangements, where the courts have had limited experience applying rule of reason analysis. In vertical cases, at least, the courts appear to be converging on a definition of safe harbor for firms possessing less than a 20-25% market share in a relevant market.¹¹⁸ We believe this threshold

116. See U.S. DOJ, *Merger Guidelines*, Trade Reg. Rep. § 13.103 (CCH) (1984).

Judge Bork recognized the logic of parallel treatment of contractual integration and mergers in *Rothery*, 792 F.2d at 230 ("Merger policy has always proceeded by drawing lines about allowable market shares and these lines are based on rough estimates of effects because that is all the nature of the problem allows. If Atlas bought the stock of all of its carrier agents, the merger would not even be challenged under the Department of Justice Merger Guidelines because of inferences drawn from Atlas' market share and the structure of the market. We can think of no good reason not to apply the same inferences to Atlas' ancillary restraints."); and in his scholarly writings, R. BORK, *THE ANTITRUST PARADOX* 264 (1978) ("Both internal growth and horizontal merger eliminate rivalry, and they do so more permanently than do cartel agreements. Prices are fixed and markets allocated within firms. The reason we do not make these eliminations of rivalry illegal per se is that they involve integration of productive activities and therefore have the capacity to create efficiency. Contract integration (including those integrations involving price-fixing and market-division agreements) are also capable of producing efficiency. The law of contract integration and of ownership integration should, therefore, be made symmetrical.").

117. Lack of Supreme Court guidance moved Judge Wald to write a concurrence in *Rothery*, 792 F.2d at 231-32 separating herself from the majority's reliance on a market power filter for rule of reason analysis. Absent Supreme Court adoption of such an approach, she thought it more prudent "to proceed with a pragmatic, albeit non-arithmetic, and even untidy rule-of-reason analysis," which balances the anticompetitive evils against the procompetitive virtues of a challenged practice.

118. See *Assam Drug Co. v. Miller Brewing Co.*, 798 F.2d 311, 318 n.18 (8th Cir. 1986) ("Assam has not provided any basis for an argument, given a market share of 19.1%, that Miller does have market power."); *O.S.C. Corp. v. Apple Computer, Inc.*, 601 F.Supp. 1274, 1291 n.8 (C.D. Cal. 1985) ("Although there is some dispute about whether Apple's market share was 6% or approached 20%, the actual percentage is not material since there is no dispute that competition (and the number of competitors) was intense before, and increased after, the mail order prohibition was adopted."); *Donald B. Rice Tire Co. v. Michelin Tire Corp.*, 483 F.Supp. 750, 761 (D. Md. 1980) (20-25% market share does not constitute market power), *aff'd*, 638 F.2d 15 (4th Cir. 1980), *cert. denied*, 454 U.S. 864 (1981).

We have found no opinion in the past ten years involving vertical non-price restraints in which market power was held to exist on the basis of market shares comparable to or lower than this figure. See, e.g., *Ryko Mfg. Co. v. Eden Servs.*, 823 F.2d 1215, 1231-32 & n.14 (8th Cir. 1982) (market share of between 8% and 10% held insufficient to demonstrate market power); *JBL Enters. v. Jhirmack Enters., Inc.*, 698 F.2d 1011, 1017

level is appropriate for horizontal as well as vertical strategic alliances that are engaged in innovation and its commercialization. We detail our approach in Section VI.B.1.a.(1) below.

(3) Market power and the balance of anticompetitive harms and procompetitive benefits

The role of market power in rule of reason analysis is also unclear where a plaintiff demonstrates that the parties to an integrative agreement actually possess substantial market power. Plainly no safe harbor will exist for defendants. But what weight should market power be given in determining the reasonableness of defendants' agreement? How should market power be incorporated into a rule of reason analysis that balances anticompetitive harms against procompetitive benefits? Does inference of anticompetitive harms increase with greater amounts of market power? Even assuming such a "sliding scale," can such negative inferences be offset by stronger degrees of proof concerning procompetitive benefits? These questions remain unanswered, contributing to the uncertainty that surrounds rule of reason analysis.

c. Factors To Be Considered under Rule of Reason Analysis.

Rule of reason analysis also generates uncertainty with respect to the factors that are to be considered and the method by which they are to be weighed and balanced by the trier of fact.

(1) Generality of terms

The Supreme Court usually speaks in only the most general terms concerning the factors to be considered. For example, the Court has said that the basic inquiry under rule of reason analysis is "whether or not the challenged restraint enhances competition,"¹¹⁹ whether the restraint is "designed to 'increase efficiency and render markets more, rather than less, competitive,'"¹²⁰ or whether there are any "countervailing

(9th Cir. 1983), *cert denied*, 464 U.S. 829 (market share of 2.3-4.2% held "too small for any restraint on intrabrand competition to have a significantly adverse effect on intrabrand competition."). Indeed, the true threshold may be significantly higher than 20-25%; in the only case which we have found where a court made an express finding of market power based on market shares, the defendant possessed a share of 70-75% in the relevant market. *Graphic Prods. Distribs. v. Itek Corp.*, 717 F.2d 1560, 1568 n.10 (11th Cir. 1983). In another recent case, the court held that a decline in the defendant's market share, from 61% in 1985 to 43% in 1987, justified a finding of lack of market power despite the retention of the 43% share. *Winter Hill Frozen Foods and Servs., Inc. v. Haagen-Dazs Co.*, 691 F. Supp. 539, 547-48 (D. Mass. 1988).

119. *NCAA v. Board of Regents of the Univ. of Okla.*, 468 U.S. 85, 104 (1984).

120. *Broadcast Music, Inc. v. Columbia Broadcasting System*, 441 U.S. 1, 20 (1978) (quoting *United States v. United States Gypsum Co.*, 438 U.S. 422, 441 n.16 (1978)).

procompetitive virtue[s] -- such as, for example, the creation of efficiencies in the operation of a market or the provision of goods and services."¹²¹ When greater detail seems warranted, the Court usually goes no further than a citation to a list of general factors:

[T]he court must ordinarily consider the facts peculiar to the business to which the restraint is applied; its condition before and after the restraint was imposed; the nature of the restraint and its effect, actual or probable. The history of the restraint, the evil believed to exist, the reason for adopting the particular remedy, the purpose or end sought to be obtained, are all relevant facts. This is not because a good intention will save an otherwise objectionable regulation or the reverse; but because knowledge of intent may help the court to interpret facts and to predict consequences.¹²²

In the end, the fact finder is directed to "weigh[] all of the circumstances of a case in deciding whether a restrictive practice should be prohibited as imposing an unreasonable restraint on competition."¹²³

This level of generality is unsatisfactory from the perspective of cooperative agreements attempting to innovate and commercialize the fruits of innovation. The articulated factors direct attention to the nature of competition, markets, efficiencies, and anticompetitive harms and procompetitive benefits. There has been no specific appreciation of the needs of innovators, the dynamic aspects of the innovation process, or society's benefit from innovation. A more sensitive, discerning rule of reason in the context of innovation would focus on the pace and stage of technological change and the need for operational and strategic coordination, appropriability, and commercialization, as well as the general factors previously cited by the Court.

(2) *Less restrictive alternative analysis*

Another source of confusion in the rule of reason is the use of "less restrictive alternative" analysis, under which a cooperative arrangement might be held illegal because the efficiencies or procompetitive benefits could be achieved by a combination of fewer firms or using less restrictive contractual terms.¹²⁴

121. *FTC v. Indiana Fed'n of Dentists*, 476 U.S. 447, 460 (1986).

122. *Id.* at 458 (1986); *Chicago Bd. of Trade v. United States*, 246 U.S. 231, 238 (1918); cited and quoted in *Continental T.V., Inc. v. G.T.E. Sylvania, Inc.*, 433 U.S. 36, 49 n.15 (1977).

123. *Sylvania*, 433 U.S. at 49.

124. *Copper Liquor, Inc. v. Adolf Coors Co.*, 506 F.2d 934, 947 (5th Cir. 1975); *White Motor Co. v. United States*, 372 U.S. 253, 271-72 (1963) (Brennan, J., concurring); *See, e.g.*, Comment, *supra* note 96, at 908-09; Turner, *The Validity of Tying Arrangements Under the Antitrust Laws*, 72 HARV. L. REV. 50, 59, 64 (1958).

The problem with this form of analysis is that it can become a "trump card" in the hands of lawyers and economists who argue that the benefits of a cooperative arrangement could have been achieved with less restraint on trade.¹²⁵ In effect, this standard has the potential for permitting courts to employ hindsight in second-guessing difficult business judgments about how to achieve efficiencies and procompetitive benefits.¹²⁶

(3) *Weighing and balancing factors*

The Court has held that rule of reason analysis requires plaintiffs to first establish a prima facie case of anticompetitive harm, after which the burden shifts to defendants to justify cooperative arrangements in terms of efficiencies and procompetitive benefits.¹²⁷ However, once plaintiffs have established a prima facie case of anticompetitive harm by proving substantial market power or actual anticompetitive harms, and defendant has responded by demonstrating efficiencies and

125. See *American Motor Inns, Inc. v. Holiday Inns, Inc.*, 521 F.2d 1230, 1249-50 (3rd Cir. 1975).

126. As the Third Circuit has noted, "[a]pplication of the rigid 'no less restrictive alternative' test . . . would place an undue burden on the ordinary conduct of business. Entrepreneurs . . . would then be made guarantors that the imaginations of lawyers could not conjure up some method of achieving the business purpose in question that would result in a somewhat lesser restriction of trade. And courts would be placed in the position of second-guessing business judgments as to what arrangements would or would not provide 'adequate' protection for legitimate commercial interests." *Id.* See also 1 M. HANDLER, *TWENTY-FIVE YEARS OF ANTITRUST* 707 (1973) ("[T]here will almost always be a less restrictive alternative, and indeed, further alternative to each alternative ad infinitum"); Pitofsky, *The Sylvania Case: Antitrust Analysis of Non-price Vertical Restrictions*, 78 COLUM. L. REV. 1, 36-37 (1978).

Although the Supreme Court has not expressly addressed this area of rule of reason analysis, the NCAA opinion might be read to condone less restrictive alternative analysis. See Comment, *supra* note 96, at 908-09. In rejecting the NCAA's argument that the regulation of all television of intercollegiate football was necessary to provide a competitive balance, the Court discussed many alternatives that were not selected that might equally have provided competitive balance, and affirmed the district court's findings that many other restrictions imposed by the NCAA were "better tailored to the goal of competitive balance than is the television plan," and which are "clearly sufficient" to preserve competitive balance to the extent that is within the NCAA's power to do so. *NCAA v. Board of Regents of the Univ. of Okla.*, 468 U.S. 85, 119 (1989). In fact, the Court does not appear to have actually engaged in less restrictive alternative analysis at all. Prior to the quoted language, the Court held that "the television plan is not even arguably tailored to serve [a competitive balance] interest," *Id.*, finding that the restraints bore no *logical relationship* to the NCAA's goals -- the *sine qua non* of the reasonableness of a restraint. Less restrictive alternative analysis was unnecessary to hold the restraint unreasonable.

127. See, e.g., *FTC v. Indiana Fed'n of Dentists*, 476 U.S. 447, 495 (1986); *NCAA*, 468 U.S. at 104-07, 113; *National Soc'y of Professional Eng's v. United States*, 435 U.S. 679, 692-96 (1978); Hutchison, *Antitrust 1984: Five Decisions In Search of a Theory*, 1984 SUPREME CT. REV. 69, 111 (1984).

procompetitive benefits, the Court has given little guidance as to how these factors should be balanced.¹²⁸ These difficulties are compounded when the trade-offs are between different markets, between different time periods, or between intrabrand restraints and interbrand gains.

B. The Availability of Treble Damages Deters Cooperative Innovation

The Clayton Act permits private parties to sue for treble damages for alleged antitrust injuries,¹²⁹ and allows state attorney generals to recover treble damages on behalf of persons residing in the state.¹³⁰ Successful plaintiffs can also recover attorneys' fees.¹³¹ The availability of these remedies provides a powerful incentive for plaintiffs to litigate -- and a powerful disincentive for businesses to form cooperative innovation arrangements and strategic alliances.

Treble damages and attorneys' fees are designed to deter anticompetitive conduct by giving private plaintiffs an incentive to ferret out anticompetitive conduct, particularly when such conduct (e.g. secret price fixing or territory divisions) might be difficult to detect. In our view, these incentives are unwarranted in the context of cooperative innovation, which promises such high returns to society. The effects of most cooperative innovation arrangements, which rarely involve price or territory agreements, are not ordinarily difficult to detect. While it is difficult to measure the underinvestment in cooperative innovation caused by the threat of treble damage litigation, our judgment is that it is substantial, largely due to ingrained habits caused by a hostile antitrust tradition.

128. *Indiana Federation of Dentists, NCAA, and Professional Engineers* have not involved ultimate balancing because the Court's analysis resulted in findings of no substantial procompetitive benefits to weigh and balance against the anticompetitive harms established by the plaintiffs in those cases. See *Indiana Federation of Dentists*, 476 U.S. at 459; *NCAA*, 468 U.S. at 113-20; *Professional Engineers*, 435 U.S. at 693-95. Similarly, in *Massachusetts Board of Registration in Optometry*, Trade Reg. Rep. (CCH) 22, at 555 (June 21, 1988) the Federal Trade Commission found no reason to engage in "full balancing" normally associated with the rule of reason, because there was "no plausible efficiency justification" for the optometry board's restraints on truthful advertising. *Id.* at 22-243, 22-245.

129. 15 U.S.C. § 15 (1982).

130. 15 U.S.C. § 15c (1982).

131. 15 U.S.C. § 15 (1982).

C. The National Cooperative Research Act Does Not Go Far Enough

1. CONGRESSIONAL RESPONSE TO ANTITRUST'S INHOSPITABLE ENVIRONMENT FOR COOPERATIVE RESEARCH.

Congress has recognized that the uncertainties of the antitrust laws and the potential for treble damage litigation are primary reasons why U.S. firms have failed to enter into cooperative innovation arrangements on a par with their European and Japanese counterparts.¹³² Its response thus far has been the National Cooperative Research Act (NCRA) of 1984. The NCRA takes two significant steps to remove legal disincentives to cooperative innovation.¹³³

a. Institutionalized Rule of Reason

The NCRA provides that "joint research and development ventures" must not be held illegal *per se*, and that such ventures instead should be "judged on the basis of [their] reasonableness, taking into account all relevant factors affecting competition, including, but not limited to, effects on competition in properly defined, relevant research and development markets."¹³⁴ In adopting the rule of reason, Congress essentially codified existing law.¹³⁵ Nevertheless, in removing any doubts about the inapplicability of *per se* rules, the NCRA does take a step towards eliminating persistent legal uncertainties.

b. Registration Procedure to Limit Damages

The NCRA establishes a registration procedure for joint research and development ventures,¹³⁶ limiting antitrust recoveries against registered ventures to single damages, interest, and costs, including

132. See, e.g., H.R. REP. No. 1044, 98th Cong., 2d Sess. 8-9, reprinted in 1984 U.S. CODE CONG. & ADMIN. NEWS 3131, 3133; 130 CONG. REC. S8963 (June 29, 1984) (statement of Sen. DeConcini) ("Of particular concern is that Japanese antitrust law does not prohibit companies from conducting joint research. . . ."); 130 CONG. REC. H10568 (Oct. 1, 1984) (statement of Rep. Hyde) ("Our major trading partners -- Japan, Germany, and France, for example -- have all sanctioned collaborative efforts on research and development.").

133. For a general discussion of the legislative history of the NCRA, see Wright, *supra* note 59, at 137-44. See also H.R. REP. No. 1044, 98th Cong., 2d Sess. 14, reprinted in U.S. CODE CONG. & ADMIN. NEWS 3131, 3139 ("a pre-eminent purpose of this bill is to clarify the antitrust analysis of joint R&D ventures.").

134. 15 U.S.C. § 4302 (Supp. 1986).

135. See Wright, *supra* note 59, at 178.

136. 15 U.S.C. § 4305(a)-(b) (Supp. 1986).

attorney's fees.¹³⁷ Thus, Congress eliminated the threat of treble damages for litigation challenging cooperative innovation arrangements, provided that the parties to the arrangement first register their venture.

Undoubtedly, the NCRA is a significant piece of legislation, notwithstanding the modesty of its first steps. The Act demonstrates that Congress has recognized the importance of innovation to the American economy and to America's competitiveness in a world marketplace.

2. THE NCRA'S SHORTCOMINGS

Perhaps because it was Congress' first major effort in this area, it is not surprising that the NCRA failed to take important additional steps that we believe would provide greater incentives for cooperative innovation and commercialization arrangements without threatening competition.

a. The Importance of Commercialization to Successful Innovation Is Not Recognized

The substantive protections provided by the NCRA -- guaranteed rule of reason treatment and reduction of damages -- extend only to research¹³⁸ and downstream commercial activity "reasonably required" for research and narrowly confined to marketing intellectual property developed through a joint R&D program.¹³⁹ Treatment of

137. 15 U.S.C. § 4303(a) (Supp. 1986). The Act allows prevailing defendants to recover attorney's fees only "if the claim, or the claimant's conduct during the litigation of the claim, was frivolous, unreasonable, without foundation, or in bad faith." 15 U.S.C. § 4304(a)(2) (Supp. 1986).

138. The NCRA's substantive protections extend only to "joint research and development ventures," defined as "any group of activities" undertaken for the purpose of theoretical analysis, experimentation, development or testing of engineering techniques, conversion of scientific or technical theories into practical applications, or collection or exchange of research information. 15 U.S.C. § 4301(a)(6) (Supp. 1986).

139. 15 U.S.C. § 4302 (Supp. 1986). The legislative history of the NCRA contains statements both that ancillary restraints are not covered, *see* 130 CONG. REC. H10566 (Oct. 1, 1984) (statement of Rep. Rodino), and that they should be, *see* S. REP. No. 427, 98th Cong. 2d Sess. 16, *reprinted in* 1984 U.S. CODE CONG. & ADMIN. NEWS 3105, 3112-13 ("Marketing this intellectual property may be the ultimate goal and a key financial aspect of a joint R&D program and is rightfully viewed as an integral part of it."). *See* Wright *supra* note 59, at 161, 180-81. The NCRA expressly excludes from coverage (1) exchanges of information about costs, sales, profitability, prices, marketing or distribution that are "not reasonably required to conduct the research and development," 15 U.S.C. § 4301(b)(1) (Supp. 1986), (2) agreements regarding production or marketing of any product, process or service other than "proprietary information" developed through the venture, 15 U.S.C. § 4301(b)(2) (Supp. 1986), and (3) agreements (if not "reasonably required to prevent misappropriation of proprietary information") restricting or requiring participation in other R&D in the sale of developments not developed through the venture. 15 U.S.C. § 4301(b)(3) (Supp. 1986).

commercialization agreements is thus left uncertain, to be determined only by interpretation of the "reasonably required" standard.

In our view, the NCRA is not sufficiently generous toward cooperative commercialization efforts in the context of cooperative innovation. By limiting protection to joint marketing of intellectual property only, for example, the NCRA unwisely precludes joint manufacturing and production of innovative products and processes, which in turn might provide the cooperating ventures with significant feedback information to aid in further innovation and product development.¹⁴⁰ To be sure, it is possible that one might interpret the language "reasonably required" to include all commercialization efforts that aid continued and next generation research of the kind that we have described as critical to cooperative innovation.¹⁴¹ Whatever the proper reading, we think it would be better to recognize forthrightly that commercialization may be integral to successful, ongoing innovation efforts.¹⁴² To examine commercialization only in terms of whether it is "ancillary" to or "reasonably required" for joint research is likely only to perpetuate analytical confusion and unpredictability when the rule of reason is applied to cooperative innovation arrangements.

b. Rule of Reason Analysis Is Not Adequately Defined

The NCRA gives little guidance concerning the substantive content of its rule of reason approach.¹⁴³ To its credit, it does, in requiring that markets be defined in the context of research, implicitly acknowledge the need to define market power in terms of identifiable markets that are tailored to the special characteristics of research and innovation. However, the NCRA fails either to create a market-power-based safe harbor or to specify factors to be considered within rule of reason analysis. It simply requires consideration of "all relevant factors affecting competition," paying no special attention to the special characteristics of the innovation process in a quickly changing industry. In this sense, it does not adequately reflect Congress' appreciation of the importance of innovation to American competitiveness.

140. *Id.* See also *supra* Section II.C.1.(b).

141. *Id.* Indeed, we suggest below that the courts should interpret "reasonably required" to reach this result. See *infra* Section VI.B.2.

142. See *infra* Section VI.C.1.

143. See Grossman & Shapiro, *Research Joint Ventures: An Antitrust Analysis*, 2 J. L., ECON., AND ORGANIZATION 315, 316 (1986) ("Although Congress undoubtedly has diminished the antitrust risks facing potential venturers, considerable uncertainties remain, not the least of which concerns the interpretation of the new law's broad rule-of-reason approach.").

c. The Registration Procedure Fails to Provide Effective Protection from Antitrust Exposure

While the NCRA's elimination of treble damages for registered ventures is an important step forward, cooperating firms are still not protected from antitrust litigation. The cost of defending antitrust suits is not materially reduced by the exceedingly narrow circumstances in which the Act permits an award of attorneys' fees to prevailing defendants.¹⁴⁴ Moreover, single damages are still available. We believe that if an approval procedure existed under which procompetitive arrangements could obtain exemptions from further antitrust exposure to private damage actions, then many more competitively beneficial ventures would utilize the NCRA.

3. REGISTRATIONS UNDER THE NCRA ARE DISAPPOINTING BUT NOT SURPRISINGLY LOW

Businesses seem to have recognized the limited nature of the steps taken by the NCRA. Only 111 separate cooperative ventures registered under the NCRA between 1984 and June 1988. We have attempted to classify these according to the field of endeavor of the contemplated cooperation,¹⁴⁵ aggregating filings into the categories identified in Figure 3.

144. 15 U.S.C. § 4304(a) (Supp. 1986). Prevailing antitrust plaintiffs have long been able to recover their attorney fees. 15 U.S.C. § 15 (1982). Rather than treat prevailing defendants in like fashion, the NCRA permits prevailing defendants to recover attorney fees if the plaintiff's suit challenging the cooperative R&D venture is found to be "frivolous, unreasonable, without foundation or in bad faith." 15 U.S.C. § 4304(a) (Supp. 1986).

We propose symmetrical fee shifting provisions that permit the prevailing party -- plaintiff or defendant -- to recover attorney fees. See *infra* Section VI.C.2.c.(4).

145. The purposes of cooperative endeavors registered under the NCRA are published in the *Federal Register*. We have classified these registrations by referring only to the information described in this source.

Figure 3

**Registration of Cooperative Endeavors Under
The National Cooperative Research Act¹⁴⁶
January 1985 - June 1988**

<i>Categories</i> ¹⁴⁷	<i>Number</i>	<i>Percent of Total</i>
Advanced Materials	4	3.6
Biotechnology	3	2.7
Energy	10	9.0
Environmental, Health, and Medical	33	29.7
Information	33	29.7
Manufacturing	28	25.2
Total	111	100

Several observations should be made. First, the number of registrations is small. Second, we have the impression that most of these are very modest endeavors. At least one pre-existing and substantial entity, Bellcore, has registered under the NCRA, but with the exception of MCC and the SRC (discussed earlier), we believe that most of the endeavors operating under the Act have budgets of less than \$5 million per year. Third, we are struck by the total number of endeavors aimed at solving environmental and health problems -- about 30 percent of the total non-redundant registrations. The Motor Vehicle Manufacturers Association, for instance, has 15 endeavors dealing with research on diesel emissions, benzene emissions, acid rain, long-range transport of air pollutants, and vehicle side impact test procedures. In short, the NCRA appears to have been employed largely for endeavors aimed at solving industry problems that are not of great competitive moment.

¹⁴⁶ As published in the *Federal Register*, January 1985-June 1988 inclusive. We have excluded notification of membership changes. The total number of registrations would otherwise be 80.

¹⁴⁷ Author's categories. Classifications are based on limited data and may not be accurate.

D. The Antitrust Environment of Japan and Europe: A More Hospitable Environment for Cooperative Innovation

In contrast to the picture we have sketched of United States anti-trust law, Japan's and Europe's antitrust environments are more hospitable to strategic alliances and cooperative arrangements for innovation.

1. JAPAN

The basic Japanese attitude is that joint R&D activities are procompetitive and thus should not be touched by the Antimonopoly Act. Significantly, the term "R&D" in Japan includes joint commercialization.¹⁴⁸ The Fair Trade Commission is responsible for executing and enforcing the Antimonopoly Act of 1947, which, like the Sherman Act, broadly prohibits unreasonable restraints of trade. While there is no specific legislative exemption for joint innovation arrangements under the Act, the FTC has been able to exempt cooperative innovation efforts from the scope of the law by virtue of its power as the primary enforcer of the Act.¹⁴⁹ FTC policy states that if there are cases presented where competition allegedly is negatively impacted, the procompetitive benefits of innovation must be balanced against any anticompetitive effects.¹⁵⁰ Balancing will take place not only within a particular market but also across markets, because "there is a possibility of the emergence of competition at the intersection of industrial sectors as a result of joint R&D between firms in different sectors."¹⁵¹

In considering anticompetitive effects of cooperative innovation arrangements, the FTC analyzes market shares and market structure.¹⁵²

148. Indeed, the literal Japanese translation of "R&D" -- *kenkyu kaihatsu* -- implicitly includes commercialization; there is no semantic distinction between the concepts of R&D and commercialization.

149. The basic administrative policy outlining the standards by which such joint innovation efforts are to be scrutinized, is contained in Fair Trade Commission (Japan), *Minkan kigyo ni okeru kenkyu kaihatsu katsudo no jittai to kyoso seisaku jo no kaidai* (Research and Development Activities in Private Enterprises and Problems They Pose in the Competition Policy) 37-39 (1984) [hereinafter FTC (Japan), *Research and Development Activities*]. The report states that the evaluation of the anticompetitive effect of joint R&D at the product market stage will depend significantly "on the competition and market shares among the participants and the market structure of the industry to which the participants belong. . . . In cases where the market shares of the participants are small . . . the effects will be small." Although "small" is not defined in the report, Japan's Merger Guidelines state that the FTC is not likely to closely examine cases in which the combined market share of the merging parties is less than 25%. See H. IYORI & A. YESUGI, *THE ANTIMONOPOLY LAWS OF JAPAN* 86-88 (1983). Our discussions with MITI and FTC officials confirm that the horizontal merger safe harbors would be equally applicable to cooperative contractual arrangements.

150. *Id.*

151. *Id.*

152. *Id.*

The FTC report specifically recognizes the needs of innovators and articulates procompetitive justifications that include (1) the difficulty of single-firm innovation, (2) the abbreviation of the time needed for innovation by cooperation and specialization between joint participants, (3) the pursuit of innovation in new fields by utilizing shared technology and know-how, and (4) enhancement of the technological level of each participant through the interchange of technology.¹⁵³ Recognizing the liberality of Japanese antitrust treatment of cooperative innovation arrangements, Japanese firms have felt free to include numerous restrictive clauses in their joint contractual arrangements.¹⁵⁴

When MITI seeks to promote cooperative R&D activities (for example, as authorized by the Act for Facilitation of Research in Key Technology,¹⁵⁵ or the Research Association for Mining and Manufacturing Technology Act¹⁵⁶) the FTC is consulted in advance concerning competition problems. Once the activities are cleared by the FTC, it is extraordinarily unlikely that the FTC would pursue antitrust remedies at a future time. Significantly, treble damages are not available to private parties seeking to enforce Japanese antitrust laws.¹⁵⁷ Moreover, even private suits for single damages under the Act are very rare and usually unsuccessful.¹⁵⁸

153. *Id.*

154. *Id.* at 29-30.

Restrictive Clauses in Joint R&D Contracts

Restriction on the production and sales of the fruit of R&D	4.3%
Restriction on the geographical area of the production and sales of the fruit of R&D	5.1%
Restriction on the customer, price or method of distribution of the fruit of R&D	8.7%
Prohibition or restriction on other R&D activities	10.1%
Restriction on the prices or suppliers of the raw materials for the fruit of R&D	12.3%
Restriction on further R&D activities based on the fruit of the joint project	23.9%
Restriction on licensing of the existing know-hows or patents	30.4%
Restriction on the production or sales activities	35.5%
Joint production or sales based on the fruit of R&D	40.6%
Prohibition or restriction on joint R&D with third parties	48.6%
Obligation to cross-license the existing technology	58.0%
Prohibition or restriction on licensing of patents to third parties	62.3%

The fact that Japanese firms would willingly disclose these restraints is powerful evidence of how little fear there is of antitrust enforcement. *Id.* 29-30.

155. Kiban gijutsu kenkyu enkatsukai ho, Law No. (Japan) 65 of 1985.

156. Kokogyo gijutsu kenkyu kumiai ho, Law No. (Japan) 81 of 1961.

157. Violations of EC Law are also exposed only to single damages in private suits; or to fines in government suits. See O.J. EUR. COMM. (No. 13) 204 (1962)(Reg. 17 Art. 3).

158. A recent case shows the difficulty of private suits. A group of consumers sued oil refining companies for damages caused by the formation of an oil cartel which had

Thus, Japanese firms cooperating on innovation and commercialization of innovation have little to fear from Japanese antitrust laws.

Under this type of antitrust environment, it is not surprising that there is frequent collaboration for innovation. Although regular statistics are not kept in Japan, because there is no reporting requirement for collaborative research and commercialization activities, the Federal Trade Commission report on Research and Development Activities in Private Enterprise and Problems They Pose in Competition Policy issued in 1984¹⁵⁹ contains statistics suggestive of the quantity and variety of joint innovation activities in Japan. The survey results indicate that joint R&D projects among corporations in the same industrial sector, which might be classified as horizontal collaboration, represent 19.1 percent of total projects.

The survey also reveals the extent of joint R&D activities generally. Overall, 54.9 percent of the surveyed corporations engaged in some type of joint R&D activities, averaging 8.7 contracts or other agreements per corporation.¹⁶⁰ Three types of joint R&D activities were defined in the survey: (1) those based on the Research Association of Mining and Manufacturing Technology Act (RAMMTA), (2) those carried out by contract with outside corporations or research organizations (less than 10% affiliates) and, (3) those carried out via a joint venture with outside corporations (less than 10% affiliates). Most of the joint R&D projects were between two corporations and most were on a contractual basis. However, as the number of participants in a project increased it was more likely that the project was conducted through RAMMTA.¹⁶¹

been successfully sued by the FTC for pricing-fixing. See *Japan v. Itemitsu Kosan ko, Ltd.*, 38 Keisu 1287 (Sup. Ct. 2nd P.B., February 24, 1984). The Supreme Court rejected the private claim on the grounds that there was no proof that lower prices would have prevailed in the absence of the cartel. See also *Kai v. Cosmo Oil Co., Ltd.*, 1239 Hanrei Jiho 3 (Sup. Ct. 1st P.B., July 2, 1987).

159. FTC (Japan), *Research and Development Activities*, *supra* note 149, at 37-39. Questionnaires were sent to 484 manufacturing corporations in the fields of electronics, telecommunications, automobiles, chemicals, ceramics, steel and non-ferrous metals, whose stocks were listed in Tokyo and Osaka Stock Exchanges. Two-hundred forty-two corporations provided data on their activities. These represent 1.9 percent of the total manufacturing industry that engage in R&D activities in terms of the number of corporations, and 16.7 percent in terms of sales. *Id.* at 3,4.

160. As to the nature of the joint R&D projects, 54.3 percent of the total cases were developmental research. Basic and applied research were 13.6 and 32.1 percent respectively. However, in the case of large corporations with capital of more than 10 billion yen, the total basic and application research amounted to 52.1 percent. *Id.* at 25.

161. Ninety-four and two tenths percent of the joint R&D projects were on a contractual basis. RAMMTA projects represented 5.5 percent and joint ventures were very uncommon representing only 0.3 percent of the total. More than 85 percent of the projects between three or more participants were under RAMMTA and with five or more participants the figure was almost 100 percent. Sixty-six and four tenths percent of the collaborative arrangements were with firms in a different industry, and 20.5 percent were

2. EUROPE

The antitrust environment shaping cooperation in Europe is also markedly different from the U.S. environment. The most important competition policy is that of the EEC. In 1968, the European Commission issued a Notice of Cooperation between Enterprises which indicates that horizontal collaboration for purposes of R&D normally is outside the scope of antitrust concerns as defined in Articles 85 and 86 of the EEC Treaty.¹⁶² The commission has consistently taken a favorable position on R&D agreements unless the large entities involved imply serious anticompetitive consequences.

In 1984, the European Commission adopted Regulation No. 418/85 (hereafter Reg. 418) expanding the favorable antitrust treatment of R&D. It provides blanket exceptions for horizontal R&D arrangements, including commercialization up to the point of distribution and sales, for firms whose total market share does not exceed 20 percent.¹⁶³

As a general prerequisite to qualifying under Reg. 418, R&D must be conducted according to a pre-established program defining the objectives of the project.¹⁶⁴ Joint exploitation additionally requires that it relate to results that are protected by intellectual property rights or

with firms in the same industry. The remaining R&D ventures involved collaboration with governmental institutions or universities. *Id.* at 28.

162. Notice concerning agreements, decisions and concerted practices in the field of cooperation between enterprises, O.J. EUR COMM (No. 75) (1968), corrected by O.J. EUR. COMM. (No C84)(1968).

163. Regulation No. 418/85 of 19 December 1984 on the application of Art. 85(3) of the Treaty to categories of research and development agreements, O.J. EUR. COMM. (No. L 53) 5 (1985), entered into force March 1, 1985, and applicable until December 31, 1997. The statutory framework of Reg. 418 is complex and can best be illustrated by highlighting its most important features. It applies to three categories of agreements involving R&D: (1) joint research and development of products or processes and joint exploitation of the results of that R&D, (2) joint exploitation of the results of R&D product or processes pursuant to a prior agreements between the same parties, and (3) joint research and development of products without joint exploitation should the agreement fall within the purview of Art. 85(1). Under Reg. 418, joint exploitation is interpreted to mean joint manufacturing and licensing to third parties. Joint distribution and sales, however, are not covered and require individual exemptions pursuant to Art. 85 (3).

164. Reg. 418 also lists, in great detail, anticompetitive restrictions that may not be inserted in the agreement. The "Black List" contained in Art. 6 renders Reg. 418 inapplicable to agreements which, for example, restrict the participating parties as to the quantity of and price-setting power for the contract products they manufacture or sell to third parties. *Id.* at Art. 6(c) and (d). However, entities may still enjoy the benefits of the block exemption if a participating party limits itself to an obligation not to enter into agreements with third parties involving R&D in the area covered by the original agreement for the duration of the project. *Id.* Art. 4 (I)(b). Application of Reg. 418 is also not impeded by an R&D agreement which imposes an obligation not to manufacture the contract products or utilize the contract process in territories that are reserved for other parties. *Id.* at Art 4 (I)(d).

constitute know-how that contributes substantially to a technical or economic process. Such results must also be "decisive" for the manufacturing of the new or improved goods. All R&D agreements must indiscriminately provide access to the results for each participating entity. If joint exploitation is not contemplated, each party must be free to exploit independently the results of the joint R&D as well as any necessary pre-existing technical knowledge. Depending on the parties' status, the market share requirements vary.¹⁶⁵

To expedite and simplify the process leading to exemption, the Commission included in Reg. 418 what it terms an opposition procedure. Agreements containing provisions that are neither declared proper nor explicitly proscribed in Reg. 418 may be notified and will be deemed exempted unless the Commission states its opposition within six months after such notification.¹⁶⁶ This opposition procedure was made available in response to an increasing concern among the business community that the duration of ordinary proceedings would result in unduly long periods of legal uncertainty for the applying parties.

Under the EEC's regime, violations of the law invoke single damages only.¹⁶⁷ Formal investigations may originate from the Commission's own observation, from an application for negative clearance, from a notification for exemption, or from the receipt of a formal or anonymous complaint.¹⁶⁸ Upon finding a violation of Art. 85 or 86, the Commission may impose a cease and desist order or require affirmative remedial steps in addition to, or in lieu of, awarding damages.¹⁶⁹ Further, Art. 85 II of the Treaty provides that infringing components of an agreement will be deemed void.¹⁷⁰ Finally, the Commission has the power to assess two type of fines, one for the violation of procedural requirements, and a

165. Where the parties to the agreement are not competitors for goods which may be improved or replaced by the results of R&D, the exemption applies irrespective of the market share held by the participating parties.

Where two or more parties are competitors, the exemption applies if the parties' combined production of such goods does not exceed 20 percent of the market at the inception of the joint venture.

Regardless of the status of the parties, the exemption will continue to apply after five years of the joint exploitation if the production of the new product combined with other, equivalent goods generated by the parties does not exceed 20 percent of the total market for such products.

166. O.J. EUR. COMM. (No. L. 53) 5 (1985) (Reg. 418, Art. 7). The parties which want to avail themselves of this procedure must explicitly refer to this article and provide complete and accurate documentation of the relevant facts.

167. O.J. EUR. COMM. (No. 13) 204 (1962) (Reg. No. 17 Art. 3).

168. I. VAN BAEL, J. BELLIS, *COMPETITION LAW OF THE EEC* 282-86 (1987).

169. *Id.* at 302 (citing *Commercial Solvents v. Commission*, ECR 233, 255-56 (1974)).

170. *Id.*

much larger one for the breach of substantive antitrust law.¹⁷¹ There has been a great deal of collaborative activity in Europe under EC Reg. 418. As shown in Figure 4, the available data suggests considerable interest by European firms in cooperative research, development and commercialization.

Figure 4

EC Applications and Notification of Block Exemptions from Antitrust¹⁷²

<i>Year</i>	<i>Total Pending</i>	<i>Annual New Filing</i>	<i>Total at Year End</i>
1982	3,175	256	4,199
1983	3,654	228	4,138
1984	3,708	195	4,194
1985	2,878	213	3,313
1986	3,032	330	3,522

171. Parties which furnish inaccurate or incomplete information during the notification process or with respect to an application for negative clearance face the imposition of a fine which ranges between 100 and 5,000 ECU. The same sanction is available against delayed responses to, or noncompliance with, discovery requests. For breaches of substantive antitrust law, Reg. 17 authorizes the Commission to impose a much broader range of fines from 1,000 to 1,000,000 ECU, or a sum up to 10 percent of the turnover of the preceding business year. *Van Bael, Bellis supra* note 168, at 304 (citing EEC Treaty Regulation No. 17 Art. 15(2)). The Court of Justice has interpreted "turnover" as inclusive of the sales of all products of the firm on a worldwide basis. *Id.* at 307 (quoting *Music Diffusion Francaise v. ECR* 1825, 1909 (1983)). In assessing the individual fine, the Commission takes into account the nature and duration of the infringement, the size of the participating entity and its share of responsibility for the violation. *Id.* Despite these yardsticks, the commission appears to be unpredictable as to the magnitude of sanctions it will impose for a substantive infringement. Cases with similar fact patterns involving similar violations have resulted in drastically different fines. *Id.* at 308-09 (and collected references). For a list of fines imposed between 1969 and 1986, see *Id.* at 664-77.

172. This data is reported in the Twelfth through Sixteenth Reports on Competition Policy, 1982-1987 issued by the EC. (table compiled by author).

Figure 4 (continued)**EC Type of Application and Notification**

<i>Year</i>	<i>Licensing</i>	<i>Distribution</i>	<i>Horizontal</i>	<i>Percentage</i>
1982	62	25	11	100
1983	62	25	13	100
1984	63	24	13	100
1985	51	31	18	100
1986	50	32	18	100

VI. PROPOSED JUDICIAL AND LEGISLATIVE CHANGES TO U.S. ANTITRUST LAW

We have set out the reasons that successful innovation requires operational and strategic coordination, and we have surveyed how current U.S. antitrust law inhibits beneficial cooperation. We believe it is time to modify U.S. antitrust policy in ways that will encourage and nurture innovation and its successful commercialization and put American businesses on an equal footing in the world market. In this section we identify key policy changes and then suggest how they might be achieved by judicial and legislative means.

A. Elements of Change

To insure that antitrust law is responsive to the needs of innovators and does not inhibit U.S. firms from competing effectively in global markets experiencing rapid technological change, we believe the following changes are in order:

(1) A market-power-based safe harbor should be expressly adopted which would shield from antitrust liability cooperative innovation arrangements or strategic alliances that involve less than 20-25% of the relevant market.

(2) Market definition should be tailored to the context of innovation, and should focus primarily on the market for know-how; specific product markets become relevant only when commercialization is included within the scope of the cooperative agreement.

(3) The rule of reason should be clarified to take specific account of the pace and stage of technological change and the need for operational and strategic coordination, appropriability, and commercialization.

(4) Antitrust law should not bias the selection of interfirm organizational forms; at a minimum, integrations by contract or alliance should be treated no less favorably than full mergers.

(5) Private antitrust suits challenging cooperative innovation arrangements should be limited to equitable relief only; and attorneys fees should be awarded to the prevailing party.

The first four proposals can be accomplished by courts interpreting the rule of reason and the National Cooperative Research Act; the last proposal will require legislation. To achieve the complete package of substantive and procedural changes most quickly, and thus assure certainty and predictability, we believe legislation is the best overall solution. In the absence of legislation, however, courts should not hesitate to employ the traditional tools of evolutionary, common law interpretation to sort out and clarify the relationship between innovation and antitrust law in the manner set forth in the first four proposals. We next discuss judicial approaches and then we specify our legislative proposal.

B. Proposed Judicial Changes

1. TOWARD A CLEARER RULE OF REASON FOR COOPERATIVE INNOVATION ARRANGEMENTS

In order to clarify the rule of reason, the courts should explicitly adopt the burden-shifting approach that has been implicit in the Supreme Court's recent rule of reason cases.¹⁷³ In the context of innovation, the courts should also make important modifications to focus the inquiry on special justifications likely to be present when the challenged conduct is designed to facilitate and promote innovation. The following is a brief description of how we believe the rule of reason should operate.¹⁷⁴

a. Prima Facie Case

We read the Supreme Court's recent opinions as giving plaintiffs a methodological choice: prove anticompetitive effects with evidence of substantial market power, with evidence of actual anticompetitive harms, or with evidence of a naked restraint. Without evidence of actual harms or market power, plaintiffs should not be able to survive summary judgment.

We suspect that most cases involving cooperative innovation arrangements will proceed under a market power approach to rule of

173. See, e.g., *supra* note 127. Professor Areeda has suggested a similar approach to rule of reason analysis. See 7 P. AREEDA, *supra* note 110, at 1511.

174. We also recommend that Congress adopt our approach to rule of reason analysis in amendments to the National Cooperative Research Act (NCRA). See *infra* Section VI.C.3.

reason analysis, because direct proof of actual detrimental effects will usually be very difficult to establish. Thus, our approach can be described generally as adopting a market-power-based safe harbor. Even in cases in which the plaintiff is able to make a prima facie case with direct proof of anticompetitive harm, the market power test may ultimately control the analysis, depending on how defendants choose to rebut the prima facie case.

(1) *Market-power-based safe harbor*

The first step toward proving the unreasonableness of an agreement should require the plaintiff to demonstrate that the defendants possess substantial market power in some relevant market. Defendants not possessing substantial market power should be considered within a "safe harbor" and thus exempt from antitrust prosecution. Plaintiffs should have to meet their initial burden either by (1) demonstrating that the cooperating firms together possess more than 20-25% share of any relevant market,¹⁷⁵ or (2) demonstrating that the Herfindahl-Hirschmann Index (HHI)¹⁷⁶ of any relevant market will be greater than 1800 and increase by more than 50 as a result of the agreement between defendants.

The market share threshold approach finds ample support in existing practice, other nations' policies, and academic commentary. First, DOJ analysis of R&D joint ventures under the rule of reason provides for a safe harbor if there are "four comparable R&D efforts" in the

175. We have suggested a range, recognizing that choosing either 20% or 25% is somewhat arbitrary. However, if pressed we would select the 25% figure because of the benefits from innovation and the unlikelihood that the resulting market structure would yield less than competitive results.

176. The HHI measures existing market concentration and also measures the extent to which market concentration will increase as a result of a particular merger (or cooperative arrangement). The HHI measures existing market concentration by squaring the market shares of all existing firms in a market and then summing the squares.

The highest concentration level possible is 10,000. This would occur in an industry where one firm has 100% of the market ($100 \times 100 = 10,000$).

The increase in HHI resulting from an acquisition (or cooperative arrangement) can be calculated by multiplying the market share of one firm by the market share of the other firm and then multiplying the resulting number by two.

Based on the HHI, the Department of Justice Merger Guidelines classify markets into three levels of concentration: HHI under 1,000, unconcentration; HHI between 1,000 and 1,800, moderately concentrated; HHI above 1,800, highly concentrated.

The Merger Guidelines state that the DOJ is unlikely to challenge: (1) any merger in a market where the post-merger HHI is below 1,000, (2) any horizontal merger in a market where the post-merger HHI is between 1,000 and 1,800 and the merger results in an increase in HHI of less than 100 points; (3) any horizontal merger in a market where the post-merger HHI is above 1,800 and the increase in the HHI is less than 50 points. Calkins, *The New Merger Guidelines and the Herfindahl-Hirschmann Index*, 71 CALIF. L. REV. 402 (1983).

relevant market.¹⁷⁷ Second, EEC law allows block exemptions to firms with a combined market share of 20 percent or lower in markets for production of products being improved or replaced by innovations.¹⁷⁸ Third, while the Japanese FTC has not issued numerical thresholds for analysis of contractual cooperation, it too has suggested that market shares and structure are preeminent factors determining the reasonableness of joint innovation, and has adopted a 25 percent market share safe harbor for horizontal mergers.¹⁷⁹ Finally, a number of American commentators have suggested market power thresholds approximating the levels mandated by the proposal.¹⁸⁰

The 1800 HHI threshold approach essentially corresponds to treatment of horizontal and vertical mergers under the 1984 Merger Guidelines. One modification is that our proposal extends the safe harbor threshold to 1800 HHI, and thus abandons the Merger Guidelines'

177. See U.S. DOJ, *Antitrust Enforcement Guidelines for International Operations*, *supra* note 99, at S-23.

178. See EEC Commission Reg. No. 418/85, *supra* note 163, Article 3 (1985).

179. See, e.g., FTC (Japan), *Research and Development Activities*, *supra* note 149, at 37-39, indicating that evaluation of anticompetitive effects of joint R&D at the product market stage will depend significantly "on the competition and market shares among the participants and the market structure of the industry to which the participants belong. . . . In cases where the market shares of the participants are small . . . the effects will be small." Although "small" is not defined, Japan's merger guidelines state that the FTC is not likely to closely examine cases in which the combined market share of the merging parties is less than 25 percent. See H. IYORI & A. UESUGI, *supra* note 149, at 86-88.

180. Indeed, the proposal may be cautious in this regard, understating market share thresholds recommended by other scholars. See, e.g., Sullivan, *supra* note 96, at 871 n. 157 (1987) ("Whether measuring by R&D or applications market, one could probably go higher [than a 20% market share threshold for antitrust exemptions], though a court should always be open to explanations for a particular venture's perniciousness. . . . The question is whether venture participants account for a sufficient share of the market to warrant slowing the pace of innovation. In most markets, that would probably require at least a 40% share."); Baxter, *The Definition and Measurement of Market Power in Industries Characterized by Rapidly Developing and Changing Technologies*, 53 ANTITRUST L.J. 717, 723 (1984) (proposing that R&D joint ventures possessing market shares of lower than 20% be considered benign); Brodley, *supra* note 100, at 1541 (proposing that a parent of the joint venture should be "presumed to have market power if it possesses 40% of a well-defined market"); Bork, *The Rule of Reason and the Per Se Concept: Price Fixing and Market Division*, 75 YALE L.J. 373, 397 (1966) (suggesting that parties controlling "up to 25% of the market" should be permitted to engage in ancillary restraints).

One reason some of these thresholds are higher than the level we advocate is that other commentators consider only narrowly defined R&D markets, whereas we recognize that markets may well carry forward to commercialization. One approach to this difference might be to establish higher safe-harbor thresholds for R&D than for product markets where there is commercialization. We prefer instead to keep the threshold the same, but recognize that the relevant market will change depending upon whether a cooperative venture engages only in R&D, in which case the market will be very broad, or in commercialization, in which case the market will be more narrowly defined by the commercialized product or process.

middle tier of analysis for horizontal mergers between 1000-1800 HHI.¹⁸¹ We believe that the 1800 HHI threshold is justified by the fact that the proposed rule of reason deals with activities less integrative and less permanent (and thus less potentially anticompetitive) than full-fledged mergers.¹⁸²

(2) Market definition

There are two classes of relevant markets likely to be of importance in the context of innovative conduct: know-how markets and product markets. We have addressed these market definition issues in a separate paper.¹⁸³ Here, we offer a few observations.

In defining the scope of the relevant know-how markets, it is necessary to take into account all of the alternative sources of know-how for the endeavor of interest, including those firms presently competing and those who possess the potential and incentive to compete. These markets will almost always be global.

With respect to commercialization activities, standard approaches to product market definition need to be modified in the innovation context to take account of the importance of product features and performance characteristics, in addition to traditional analysis of price elasticities. Delimiting the relevant product market for a new product requires the identification of competitive products and the companies that produce them. The relevant producers are not just those producing the relevant product today. There are likely to be non-producers which have some capacity to switch over to production of the product or to develop and commercialize substitutes. Therefore, two additional types

181. See U.S. DOJ, *Merger Guidelines* *supra* note 116; see also *supra* note 176.

182. The desirability of parallel treatment of contractual integrations or strategic alliances and mergers finds support in the cases, DOJ enforcement policy, and the academic literature. See, e.g., *Rothery Storage and Van Co. v. Atlas Van Lines, Inc.*, 792 F.2d 210, 230 (D.C. Cir. 1986), *cert. denied*, 479 U.S. 1033 (1987) ("A joint venture made more efficient by ancillary restraints, is a fusion of the productive capacities of the members of the venture. That, in economic terms, is the same thing as a corporate merger. Merger policy has always proceeded by drawing lines about allowable market shares. . . ."); U.S. DOJ, *Antitrust Enforcement Guidelines for International Operations*, *supra* note 99, at 8 ("Like mergers, legitimate joint ventures and their ancillary restraints are analyzed under a rule of reason standard and are condemned only if they would have an anticompetitive effect that is not outweighed by procompetitive benefits."); Sullivan, *supra* note 96, at 872 ("[A] venture should be permitted somewhat denser concentration than would a merger between research units."); Bork, *supra* note 180, at 384 ("Since the Sherman Act attempts to look beyond legal form to economic substance, ancillary restraints and mergers should be treated similarly."); R. BORK, *supra* note 116.

183. See JORDE & TEECE, *PRODUCT MARKET DEFINITION IN THE CONTEXT OF INNOVATION: AN EXPLORATION* (Univ. of Calif. Business and Public Policy Working Paper No. BPP-29, Feb. 1988).

of firms must be included in the definition of the relevant market: (1) firms which could economically switch over and successfully sell the product in response to a small but significant and nontransitory price rise and (2) reasonably ascertainable firms which could offer a new competitive product through product or process alteration of the said product within the period of the engineering/design cycle. If a hypothetical innovator with monopoly power could sustain its product's level of sales for the length of its engineering cycle without a competitor introducing a new product with significant price or performance enhancements, then the second type of firm need not be included in the product's relevant market. Otherwise both types of firms should be included in the market definition.

Markets for know-how are almost always going to be broader in scope than markets involving commercialization. Participants in a know-how market may well include firms from quite different industries, because the research may be basic and the potential applications many. When firms cooperate to commercialize products the market will narrow and focus more particularly on the supply and demand elasticities of the specific product. Thus, the "market share" of cooperating firms is likely to be higher in a relevant end-product market than in an R&D market for know-how.

(3) *Proof of actual anticompetitive effects*

Recognizing that proof of market power is only a "surrogate" for proof of anticompetitive effects,¹⁸⁴ rule of reason analysis should also permit the plaintiff to fulfill its initial burden by directly demonstrating that the arrangement has caused actual anticompetitive harms. In most cases involving innovation, we believe this would be a very difficult approach to pursue.

b. Defendants' Rebuttal

The defendants have the burden of rebutting or responding to the evidence introduced by plaintiff. The defendants' burden should vary in degree according to how much market power they are shown to possess. For the purposes of balancing anticompetitive harms against procompetitive virtues, it is probably necessary to recognize a rough sliding scale between market power and benefits.¹⁸⁵ Thus, the greater plaintiff's proof

184. See *FTC v. Indiana Fed'n of Dentists*, 476 U.S. 447, 460-61 (1986) (citing P. AREEDA, *supra* note 110, at 1511 (1986)).

185. For discussion concerning the use of a sliding scale to balance market power against conduct, see P. AREEDA, *ANTITRUST ANALYSIS* §§ 283-84 (3rd ed. 1981); P. AREEDA, *supra* note 110, ch. 15; Briggs & Calkins, *Antitrust 1986-87: Power and Access*

of defendant's market power, the greater defendant's burden of establishing procompetitive benefits. The defendant's burden, varying as it may in weight, may be fulfilled in several complementary ways:

(1) Lack of market power: If the *prima facie* case rests on proof of substantial market power, the defendants may attack possession of market power by demonstrating that the plaintiff defined the relevant market incorrectly or in a manner inconsistent with appropriate market definition criteria, and that the error led to an unwarranted conclusion that the defendants possess substantial market power. If the defendants are able to make such a showing, the plaintiff must introduce new evidence of market power in order to avoid summary judgment, unless it had already demonstrated actual anticompetitive harms.

(2) Potential competition: The defendants may show the existence of potential competition in the relevant market to negate the potential anticompetitive harms inferred from market power.

(3) Procompetitive benefits: The defendants may introduce evidence of procompetitive benefits and efficiencies created by the cooperative arrangement. Rule of reason analysis should be focused as specifically as possible on the benefits of innovation, and on the special operational and strategic coordination needs of innovation. Thus, in addition to the traditional elements of rule of reason analysis,¹⁸⁶ defendants should be permitted to show:

(i) that the innovation sought by the cooperative arrangement will, if achieved, be inadequately protected under the patent, trade secret, or other intellectual property laws, and that specific contractual restraints have been adopted in order to secure appropriability and prevent free-riding and opportunistic behavior,

(ii) that the innovation sought by the arrangement is of such a character or magnitude that a cooperative arrangement will help achieve the economies of scale and scope necessary to mount a successful research and commercialization effort and will reduce overall risk,

(iii) that successful innovation sought by the arrangement will be aided by cooperative or integrated commercialization, including specific contractual restraints,

(iv) that the arrangement will compete in a market or markets that are characterized by rapid technological change, and

(v) that the innovation sought by the arrangement will compete with other technologies in an preparadigmatic stage of competition for particular products or processes.¹⁸⁷

(Part I), THE ANTITRUST BULLETIN 275, 294-98 (1987); Landes & Posner, *Market Power in Anti-Trust Cases*, 94 HARV. L. REV. 937, 955-56 (1981).

186. See *supra* Section V.A.1.

187. For the economies underlying these benefits, see *supra* Section III.A.

Whether or not such efficiencies exist, and whether they bear a logical relationship to challenged contractual restraints, will play a large role in the ultimate determination of whether the arrangement is reasonable,¹⁸⁸ just as in the EEC and Japan.¹⁸⁹

c. Ultimate Burden of Proof

If the defendants introduce satisfactory evidence of justifications, the final burden of proof, to show that the arrangement or any part thereof is "unreasonable," remains upon the plaintiff. The plaintiff may of course rebut evidence introduced by the defendants, bolster its showing of market power or actual anticompetitive effects, and/or introduce evidence that justifications shown to exist by the defendants could be achieved (1) by an existing firm or viable combination of firms with substantially less market power than that exercised by the arrangement in any relevant market or (2) by the parties to the arrangement in an obviously and substantially less restrictive manner.

The last of these showings is not meant to be a separate "less restrictive alternative" analysis, which we disfavor.¹⁹⁰ In our view, the existence of a less restrictive alternative is relevant to the question of reasonableness, but should never be a trump card. If plaintiffs are able to demonstrate that the benefits of a cooperative arrangement *obviously* could have been achieved with *substantially* fewer participants or a *substantially* less restrictive contractual provision, then a trier of fact might appropriately find the original cooperative agreement was an "unreasonable" restraint of trade.¹⁹¹ Thus, the existence of an obvious and substantially less restrictive alternative may be a factor considered in overall rule of reason balancing, but it should not be elevated to a separate stage of analysis.¹⁹² This approach to less restrictive alternatives reduces

188. See *infra* notes 190-93 and accompanying text.

189. See *supra* Section V.D.1.

190. See *supra* note 126.

191. The Third Circuit stated the test in this manner: "Whether the restriction 'exceed[s] the outer limits of restraints *reasonably necessary* to protect the defendant.'" *American Motors Inns, Inc. v. Holiday Inns, Inc.*, 521 F.2d 1230, 1249 (3d Cir. 1975) (emphasis added). See also *Berkey Photo Inc., v. Eastman Kodak Co.*, 603 F.2d 263, 303 (2d Cir. 1979); P. AREEDA, *supra* note 110, at 388 ("Some courts wisely ask only that the challenged restraint be 'reasonably necessary' to achieve a legitimate objective. It would not be if equal benefits could be obtained through substantially less restrictive routes.").

192. One problem we see in Professor Areeda's rule of reason approach is that it can be read to give undue weight to less restrictive alternative analysis. See P. AREEDA, *supra* note 110, at 1502, 1505.

the possibility that determination of reasonableness will turn on minute or trivial distinctions.¹⁹³

Ultimately, if a cooperative innovation arrangement is shown to both possess procompetitive benefits and cause anticompetitive harms, the plaintiff bears the burden of proving that the net balance is negative and that the arrangement or its contractual restraints are unreasonable. To be sure, the ultimate balancing remains an imprecise operation, but at least the parties will know what factors are to be balanced and the procedural burdens involved within the rule of reason analysis.

2. JUDICIAL INTERPRETATION OF THE NCRA

The NCRA leaves uncertain two areas: the scope of its protection and the parameters of the rule of reason analysis which it mandates. Courts will inevitably be called upon to clarify these uncertainties through interpretation of the Act. This task presents an opportunity to implement legal standards conducive to innovation and competitive growth.

a. Interpreting Coverage

The NCRA prohibits courts from treating joint research and development ventures under a per se illegal rule. However, as we have discussed, it extends this protection to production, marketing, and commercialization agreements only if they are "reasonably required" to conduct research and development. An immediate problem facing the courts is how to decide when such agreements satisfy this standard.

We believe that commercialization should be presumed reasonable in the context of cooperative innovation. Successful innovation in competitive markets frequently depends on interdependent feedback loops -- a chain in which each link, including commercialization, is vital to the success of the project as a whole. It is economically unrealistic to presumptively view innovation as a linear process in which the research is viewed as the primary mission and all other elements are merely ancillary.¹⁹⁴

In particular, problems of appropriability -- the risk of competitors being able to enjoy free rides on research and development performed by collaborators who are not permitted to commercialize -- suggest that commercialization and accompanying contractual restraints should be

193. For reasons stated above, we believe that the Court's discussion of less restrictive alternatives in *NCAA* is not inconsistent with our approach. See *supra* note 126 and accompanying text.

194. See *supra* notes 30, 31, 40, and 41 and accompanying text.

treated as "reasonably required" for research and development, at least for the purposes of defining the applicability of the rule of reason under the NCRA. Requiring collaborators to prove the ancillarity of commercialization restraints in order to qualify for rule of reason treatment imposes undue uncertainty on collaborative plans, especially when ancillarity is subject to widely varying interpretations.¹⁹⁵

This proposal does not disregard the competitive risks that commercialization restraints may pose. Indeed, such restraints may present opportunities for collusion, predation, elimination of actual or potential competition, or market exclusion.¹⁹⁶ However, these possibilities are adequately addressed by forcing collaborators to demonstrate genuine claims of innovation at the outset via the filing process, and then by applying the rule of reason in such a way -- including a market-power screen -- that anticompetitive effects are likely to be discovered.

b. Implementing the Rule of Reason Mandated by the NCRA

We have already detailed the rule of reason that we believe the courts should apply to cooperative innovation arrangements, whether or not parties register their venture under the NCRA.¹⁹⁷ When conducting rule of reason analysis under the NCRA, there is little reason why courts cannot, on their own initiative, adopt this same methodology. Doing so would fulfill the intent and structure of the NCRA, and would be in accordance with Supreme Court precedents applying the rule of reason. The result will be a safer, more predictable environment for innovative collaboration at no cost to meaningful competition.

C. LEGISLATIVE PROPOSAL: "THE NATIONAL COOPERATIVE RESEARCH AND COMMERCIALIZATION ACT."

New legislation is an alternative to judicially developed changes in our antitrust laws. We recommend amending the NCRA to become the "National Cooperative Research and Commercialization Act" (NCRCA). All of the substantive proposals we have recommended to the courts can and should be incorporated into such amending legislation. In addition, we believe legislation should limit private antitrust challenges of cooperative arrangements approved by the Justice Department to injunctive relief only, with attorney fees recoverable by the prevailing party.

195. See *supra* notes 101-104 and accompanying text.

196. The widespread academic skepticism about commercialization restraints stems largely from a perceived threat of these dangers. See *infra* note 203.

197. See *supra* Section VI.B.1.

We have drafted a proposed statute entitled "The National Cooperative Research and Commercialization Act," and included it as Appendix A. In the following sections we highlight the changes we propose in the antitrust laws. We are happy to report that as this article goes to press, Congressmen Rick Boucher (D-VA) and Tom Campbell (R-CA) have introduced legislation entitled, "The National Innovation and Commercialization Act of 1989,"¹⁹⁸ which would legislate changes along the lines we have proposed.¹⁹⁹

1. DEFINITIONS.

The proposed legislation broadens the basic coverage provided by the NCRA. First, it alters the semantic characterization of activities generally protected, abandoning "joint research and development venture" in favor of the more open-ended "cooperative innovation arrangement."²⁰⁰ Although no change in meaning is intended (since the NCRA expressly covers "any group of activities" between two or more persons), the proposed legislation clarifies the intent of the Act. Protection is not confined to formal joint ventures; it extends to any cooperative activities, however structured, which are geared to an overriding innovative objective.

More importantly, the proposal specifically extends coverage of the Act to cooperative commercialization efforts,²⁰¹ and thus abandons the NCRA's limited focus on research alone.²⁰² This change reflects the

198. H.R. 1024, 101st Cong., 1st Sess. § 5(b) (1989).

199. There are three areas of difference between the Boucher-Campbell bill and the Jorde-Teece proposal. First, the Boucher-Campbell bill does not spell out the elements of rule of reason analysis to be applied by courts called upon to review cooperative innovation arrangements. This distinction is probably not significant, however, because the same elements are detailed in that portion of the bill that gives guidance to the DOJ or FTC for certifying reasonable cooperative arrangements. See H.R. 1024, 101st Cong., 1st Sess. § 5(b) (1989).

Second, the Boucher-Campbell bill does not adopt symmetrical fee shifting. Rather, it incorporates the fee shifting provisions of the NCRA.

Third, the bill does not amend the NCRA. Thus, while the bill provides a certification procedure for cooperative innovation arrangements seeking to commercialize R&D, the NCRA itself, and its more limited relief, remains available only for R&D and not commercialization. Under the Jorde-Teece proposal, joint commercialization efforts -- which may include manufacturing, production, distribution, and sales -- are protected under both the NCRA's registration procedure and the new NCRCA's certification procedure, which means that businesses would have a choice between the registration and certification procedures and remedies.

200. See Appendix A, proposed § 4301a(a)(6).

201. See Appendix A, proposed § 4301a(a)(6)(E).

202. Even under the most permissive interpretation possible, the NCRA requires a showing that commercialization was "reasonably required" to achieve the innovative purpose in order for it to qualify for administrative protection and rule of reason treatment. See 15 U.S.C. § 4301(b) (Supp. 1988).

necessary interdependence of research, development, and commercialization as mutually reinforcing links of successful innovation. Protection of fewer than all the links is of little value to firms attempting to structure cooperative efforts in the most efficient and successful manner possible.²⁰³ These amendments move the United States closer to the hospitable legal environment our competitor nations provide for cooperative innovation.²⁰⁴

We recognize that as cooperative efforts extend beyond basic research to full product development and sales, it may become increasingly difficult for the cooperative firms with substantial market power to demonstrate offsetting procompetitive efficiency gains from downstream integration. However, there are instances when full commercial integration -- all the way through sales -- is warranted and we do not want to preclude parties from demonstrating such needs, especially where experience indicates that firms are unlikely to undertake cooperative innovation at all (or successfully if they try) without full integration. The potential threats posed by joint commercialization are adequately addressed

203. Other academics who have not noted the linkage between successful innovation and commercialization have been less sanguine about the need for cooperative commercialization efforts. See, e.g., Bordley, *supra* note 100, at 1572 ("It does not follow, however, that research joint ventures are free of antitrust risk. . . . Market exclusion effects arise when the joint venture supplies an indispensable knowledge input to the parents and then refuses to supply the input to the parents' rivals. . . . Collusion risk will be highest in cases in which the parents are competitors in the production and marketing of the research-connected end product."); Grossman and Shapiro, *supra* note 143, at 323-24 ("Despite the many advantages associated with RJVs, they do raise some appropriate antitrust concerns. . . . The greatest antitrust risk attached to an RJV is that of dynamic inefficiency in the R&D market: the parents may use the venture as a vehicle to collude to slow the pace of technological innovation."); Hovenkamp, *Antitrust Policy after Chicago*, 84 MICH. L. REV. 213, 278 ("As a general rule economies of scale are efficient and ought to be encouraged; however, it is now well established that scale economies can be used strategically for inefficient purposes."); Sullivan, *supra* note 96, at 874 ("When a venture deals only with information [research], claims about the utility of cooperation are most credible and claims about resulting harms are hardest to document. When the venture starts making hardware and moving merchandise, it enters those parts of the economy where the nation has trusted competition most and been served by it best."). The legislative history of the NCRA also reveals that apprehension of these risks underlaid the legislation. See H.R. REP. NO. 1044 (Conference Report), 98th Cong., 2d Sess. 9, reprinted in 1984 U.S. CODE CONG. & ADMIN. NEWS 3131, 3133-35 (identifies four major risks of joint R&D ventures: overinclusiveness, exclusion of competition, retardation of innovation, and spillovers into nonresearch markets).

204. In Japan, virtually all research and development cooperation includes joint commercialization. See *supra* note 148 and accompanying text. It should be noted that no cooperative innovation project, including those that restrain aspects of commercialization, has ever been held illegal under Japanese antitrust law. FTC (Japan), *Research and Development Activities*, *supra* note 149, at 37-39. To a somewhat lesser extent, the same is true in the European Economic Community (EEC). See *supra* note 163 and accompanying text.

through well-articulated legal standards⁷ concerning proof of market power and anticompetitive harms.

2. ADMINISTRATIVE APPROVAL OF COOPERATIVE INNOVATION ARRANGEMENTS.

The proposal adds an administrative approval mechanism for cooperative innovation arrangements. The NCRA's "disclosure" process provides only limited protection for ventures registering under the Act and involves no formal agency approval that would exempt the cooperative arrangement from antitrust exposure. While we have preserved the NCRA's minimalist protections for firms desiring that approach,²⁰⁵ we recognize its shortcomings and therefore provide an alternative process that permits affirmative approval of cooperative innovation arrangements and completely exempts them from antitrust liability.

- a. The NCRCA expands legal protection by providing agency approval.

The proposal eliminates antitrust liability for conduct by any cooperative innovation arrangement which obtains approval from the Department of Justice or the Federal Trade Commission in consultation with the Secretary of Commerce.²⁰⁶ Following approval, no criminal or civil action based in whole or in part on conduct within the scope of the arrangement may be brought under the antitrust or similar State laws.²⁰⁷ Approval, if granted, will remain in force for a maximum term of seven years, although the DOJ or FTC may approve a shorter term.²⁰⁸

These provisions represent a marked contrast to the limited damages-reduction provision adopted by the NCRA. However, we believe that there is a clear need for greater protection from antitrust exposure. The paucity of ventures registering under the NCRA suggests that greater protection is needed to encourage cooperative innovation efforts. Additional protection is also needed if United States firms are to be accorded the same favorable legal treatment accorded cooperative ventures

205. See Appendix A, proposed § 4305.

206. The proposal calls for approval by either the DOJ or FTC in consultation with the Secretary of Commerce. The DOJ and FTC must agree, shortly after filing, which agency will handle the authorization process. This parallels the manner in which the DOJ and FTC allocate responsibility for reviewing mergers. See Appendix A, proposed § 4304(b).

207. See Appendix A, proposed § 4304(d).

208. *Id.*, proposed § 4304(f). The proposal specifies that the term of antitrust approvals is 17 years, but expressly allows the DOJ and the FTC to grant shorter term approvals, if they determine that the longer term would be unreasonable. See Appendix A, proposed §§ 4304(b)(1)(B), 4304(b)(2) & 4304(f).

in Japan and Europe. Both Japan and the EEC maintain administrative processes through which joint research and development (and commercialization) projects can obtain fixed-term exemptions from the applicable antitrust laws.²⁰⁹

- b. The NCRCA clarifies standards by which approval is granted.

Once the protection conferred by administrative approval is broadened, it becomes necessary to clarify the standards by which approval is to be granted. Because the proposal contemplates full-fledged exemption of approved cooperative innovation arrangements from the antitrust laws, it must insure that approval is not granted when an arrangement poses serious anticompetitive risks. The following provisions provide this assurance.

(1) *Market-power-based safe harbor*

The proposal requires the DOJ or FTC to exempt cooperative innovation arrangements lacking substantial market power from suits under the antitrust laws. This area of exemption is labelled a "market-power-based safe harbor." A safe harbor provision, tied to a market power threshold, provides an excellent mechanism for efficiently deciding whether a cooperative innovation arrangement threatens anticompetitive harm. As discussed earlier,²¹⁰ the safe harbor is not a novel concept; both the EEC and Japan have adopted one, albeit in varying degrees,²¹¹ and the DOJ already utilizes it in analyzing research and development joint ventures.²¹² In addition, many circuit courts have begun to recognize the utility of a market power screen for evaluating cooperative conduct that does not nakedly restrain trade.²¹³

Specifically, the proposal compels the DOJ or FTC to grant approval to any applying arrangement which demonstrates: (1) it will not possess substantial market power in any relevant market and (2) the duration of the project will not overstep its innovative purpose.²¹⁴ The

209. See *supra* note 149 and accompanying text. On the EEC, see EEC Treaty, Article 85(3); EEC Commission Reg. No. 418/85, *supra* note 163, Articles I(1), III (2-3) (exemption lasts for fixed-term of five years, after which it continues as long as joint venture does not exceed 20 percent market share).

210. See *supra* notes 177-80 and accompanying text.

211. See *infra* note 224 and accompanying text.

212. See U.S. DOJ, *Antitrust Enforcement Guidelines for International Operations*, *supra* note 99.

213. See *supra* notes 111-14 and accompanying text.

214. See Appendix A, proposed § 4304(b)(1) ("The DOJ or FTC shall approve an application filed under subsection (a) if it determines, with the concurrence of the Secretary -- (A) that the arrangement will not possess substantial market power in any

requisite determination is to be based on information submitted by the applicant,²¹⁵ and must be made on the basis of market definition principles and market power thresholds specified in the Act.²¹⁶ The Act also specifies that these same thresholds are to be used by courts applying rule of reason analysis to evaluate cooperative arrangements that are not administratively approved.²¹⁷

The Act provides for two alternative thresholds; fulfillment of either in all relevant markets will justify safe harbor treatment:

formation of the arrangement); or

the presence of five or more firms in the relevant market (including the arrangement) who are capable, alone or cooperatively, of engaging in the type and scope of innovation and commercialization undertaken by the cooperative innovation arrangement in such market.²¹⁹

These thresholds are precisely the same that we argued courts should adopt as part of a common law development of rule of reason analysis; these legislative thresholds are justified for the same reasons we articulated earlier.²²⁰

(2) Approval of "reasonable" arrangements not qualifying for market-power-based safe harbor

The proposal also allows the DOJ or FTC to approve cooperative innovation arrangements that fail to qualify for market-power-based safe harbor. Despite possessing market power, cooperative arrangements may create procompetitive benefits and efficiencies -- most notably, creation of new products and new markets through innovation -- which

relevant market, and (B) that the duration of the arrangement will not exceed limits reasonably required to accomplish the objective of the arrangement, and in any event will not exceed seventeen years.").

215. Appendix A, proposed § 4304(a). At this stage of the inquiry, there is no provision for other parties to submit information pertinent to the DOJ/FTC inquiry. However, the agencies may undertake to investigate efforts on their own, and are compelled to do so whenever the information submitted by the arrangement does not fulfill statutory requirements for market definition and measurement of market power. See Appendix A, proposed §§ 4302(b), 4302(b)(4).

216. See Appendix A, proposed §§ 4304(b)(4), 4302(c). Section 4302(c) discusses the substantive market definition criteria to be considered under the proposal.

217. See *Id.*

218. Market shares are presumed unmeasurable if a relevant market, for example one for research in a particular technology, generates no sales that could form the basis for measurement of sales or relative productivity. The proposal includes this precondition in order to ensure that the arrangement may qualify -- or fail to qualify -- for the safe harbor under this alternative only if measurement under the HHI standard is not practical. Reliance on HHI data is preferred because it provides a more accurate indication of the market power of the arrangement.

219. See Appendix A, proposed § 4304(b)(3)(A-B).

220. See *supra* notes 177-84 and accompanying text.

deserve approval and justify protection from costly antitrust challenges in the courts.

The proposed standard by which the DOJ or FTC must determine whether an arrangement, or any part thereof,²²¹ qualifies on this ground is whether the arrangement is "reasonable," as defined according to a series of inquiries focused equally on the risks engendered by the cooperative efforts and efficiencies achieved.²²² These factors are the same as those we advocated courts should use when conducting rule of reason analysis.²²³ We note that many of the factors to be considered by the DOJ or FTC are also roughly the same as those considered by EEC and Japanese agencies in judging cooperative innovation arrangements.²²⁴ Thus, the Act does not allow any greater administrative tolerance of anticompetitive collaborations than does the rule of reason. The important benefit of an early administrative determination is elimination of the uncertainty, delay, and cost of potential legal challenge once the cooperative venture is under way.

- c. The NCRCA provides a process for continuing scrutiny of approved arrangements: revocations, judicial review, and injunctive relief

By exempting any cooperative innovation arrangement approved by the DOJ or FTC from the antitrust laws, the proposal entrusts antitrust analysis to administrative agencies. To insure that this analysis is carried out properly, the proposal adopts three separate review

221. The proposal allows the agencies to grant "condition" approval: approval based on the condition that the arrangements agree to modify its scope, terms, or duration to bring it into compliance with the statutory standards. See Appendix A, proposed § 4304(b)(6). This provision allows for administrative flexibility, and tracks administrative practice in the EEC. See U.P TOEPKE, EEC COMPETITION LAW 170-71 (1983).

222. See Appendix A, proposed § 4304(b)(2) & 4304(b)(5).

223. See *supra* Section VI.B.1; Appendix A, proposed § 4302.

224. Article 85-III of the EEC Treaty provides for exemptions of agreements which (1) contribute to improving the production or distribution of goods or promote technological or economic progress, (2) allow consumers a fair share of resulting benefits, (3) do not impose restrictions not indispensable to achievement of innovation, and (4) do not afford the participating parties the ability to eliminate competition with respect to a substantial part of the products in question. See EEC Commission Reg. No. 418/85, *supra* note 163.

The Japanese FTC weighs the pro-and anti-competitive effects of agreements in determining whether to challenge them; anticompetitive effects are considered through analysis of market shares and market structure, while procompetitive justifications considered include (1) difficulty of single-firm innovation, (2) abbreviation of the time needed for innovation by cooperation and specialization between joint participants, (3) pursuit of innovation in new fields by utilizing shared technology and know-how, and (4) enhancement of the technical level of each participant through interchange of technology. See FTC (Japan), *Research and Development Activities*, *supra* note 149, at 37-39.

mechanisms: (1) agency revocation of approvals, (2) judicial review of approvals, denials, or revocation, and (3) injunctive relief for private challenges to activities found outside the scope of the approved cooperative activity. These review procedures provide a sufficient mechanism for ferreting out possible bias, improper administrative actions, or activities outside the scope of approval. They strike a balance between legitimate concerns of aggrieved parties and the underlying need for a legal environment conducive to procompetitive cooperative innovation.

(1) Revocation procedures

The proposal allows aggrieved parties to petition the DOJ or FTC for revocation of approval, if approval was based on erroneous information or erroneous assessment of information.²²⁵ Because cooperative innovators must be able to rely on an assurance that their efforts, once commenced under the protection provided by administrative approval, will not be obstructed by costly administrative challenges ultimately lacking in factual basis, the proposal imposes a 90-day time limit on the challenge. This will prevent competitors from waiting until the arrangement is in full swing to submit a challenge. The proposal also recognizes that circumstances may change substantially after the initial approval is granted. Therefore, at any time during the term of approval, the DOJ or FTC, on their own initiative or following complaints received from the public, may investigate and review whether an approval should be revoked. Revocation is authorized if (1) the arrangement possesses substantial market power and is acting outside the scope of the approval that was granted or (2) circumstances have substantially changed such that it is now unreasonable to permit the cooperative arrangement to continue on the terms originally specified. We expect challenges to be resolved informally and without a hearing, based solely on written submissions by the challenging party and the parties in the arrangement, although the Act permits the DOJ or FTC to exercise discretion to hold a hearing.

(2) Judicial review

The proposal provides for judicial review of administrative actions, including denial of approval, revocation, or denial of revocation.²²⁶ The

225. Appendix A, proposed § 4304(e).

226. See Appendix A, proposed § 4304(i). There is no review of approval decisions in order to force aggrieved parties to exhaust administrative remedies -- petitions for revocation -- before seeking review in court. This will ensure that the least time-consuming and least expensive method of resolving disputes will be utilized first. Thus, review of approvals is by no means precluded, but merely approached as a last resort.

standard of review is whether the agency's decision in question is supported by substantial evidence on the record as a whole.²²⁷ These provisions essentially provide aggrieved parties a means of challenging the competitive merits of the arrangement in question. Actions for review must be initiated within 30 days of promulgation of the challenged administrative decision. The proposal directs the reviewing court to modify if possible, rather than entirely overturn, the administrative decision, thus leaving intact the essential elements of the arrangement.²²⁸ Finally, since the action is one for review of an administrative decision and not one challenging the arrangement itself, damages are not available.

(3) *Private actions for injunctive relief only*

To insure that society benefits the fullest from cooperative innovation, Congress should remove the threat of private damage actions and limit private challenges to equitable relief only. Thus, for ventures approved and certified, damages are eliminated altogether, in contrast to the single damages that remain available under the NCRA's registration procedure. By eliminating the threat of damages, collaborating firms are protected from potentially devastating damage awards, while at the same time, the available equitable relief provides private parties an effective remedy for stopping cooperative activities that are outside the scope of authorized cooperative arrangements.²²⁹ It should be noted that private actions for equitable relief will be decided by judges and not juries.²³⁰

3. *CLARIFICATION OF RULE OF REASON STANDARDS TO BE APPLIED TO COOPERATIVE INNOVATION ARRANGEMENTS NOT APPROVED BY THE DOJ OR FTC*

Because not all cooperative innovation arrangements will qualify for administrative approval, and some parties may neglect or decline to seek it, the NCRCA also expressly addresses the judicial standards by which arrangements are analyzed when challenged in court. The NCRA did so only in a rudimentary fashion, simply declaring that the rule of reason -- as opposed to per se rules -- shall apply in all such cases. Our proposal also states the rule of reason analysis should be applied, but

227. *Id.*

228. *Id.*

229. See Appendix A, proposed § 4304(b).

230. The Seventh Amendment preserves the right to jury trial in federal court for common law matters seeking damage awards. Equity claims were tried to judges -- not juries -- in England in 1791 and therefore do not require jury trial. See generally, Jorde, *The Seventh Amendment Right to Jury Trial of Antitrust Issues*, 69 CALIF. L. REV. 1 (1981).

then goes on to specify the elements of the rule of reason analysis to insure that the legal standards will be cohesive, consistent, and well-reasoned.²³¹

We incorporate in our legislative proposal the same standards we articulated earlier for judicially initiated rule of reason analysis;²³² *i.e.*, we employ a burden-shifting approach that utilizes a market-power-based safe harbor and specifies elements of analysis that are sensitive to the process of innovation and the needs of innovators.

4. SYMMETRICAL FEE-SHIFTING

The NCRA adopted an asymmetrical attorney fee provision: prevailing plaintiffs could recover fees, while prevailing defendants could only do so if the plaintiff's claim or conduct was "frivolous, unreasonable, without foundation, or in bad faith."²³³ This provision both allowed plaintiffs to press claims against cooperative ventures relatively free of risk and also added financial uncertainty to collaborators' innovative plans. We believe that these results are unwarranted. The substantial benefits of innovation which dictate that cooperative innovation arrangements receive distinctive antitrust treatment as a general matter also justify symmetrical fee-shifting. The plaintiff should bear the identical risk as the defendant in pressing or relying on ultimately unwarranted claims. The proposal adopts such an even-handed approach.²³⁴

5. NCRA REGISTRATION APPROACH PRESERVED

While we advocate a certification approach for exempting competitive innovation arrangements from the threat of private damage actions, we have preserved the NCRA's registration approach for parties who prefer it. Our amended "definitions" section of the Act extends R&D to full commercialization, whether parties seek to register or certify their cooperative innovation arrangement. The NCRA's registration approach eliminates treble damages but leaves the venture exposed to single damages. In addition, the venture proceeds without the certainty that certification can provide. On the other hand, registration is simple, quick, less expensive, and requires less disclosure. Parties confident of their small market share may prefer registration over certification. We leave the choice to business.

231. See Appendix A, proposed § 4302(a).

232. See *supra* Section VI.B.1.

233. 15 U.S.C. § 4304(a)(2) (Supp. 1986).

234. See Appendix A, proposed § 4303(a). We apply this same fee-shifting provision to litigation involving cooperative innovation arrangements that take advantage of the more limited disclosure registration provisions of the Act.

D. Economic Consequences of the Proposed Changes

We see at least three classes of opportunities for beneficial collaboration in the innovation process if the changes we propose are adopted. But before attempting to spell these out, we would like to make an observation about the irrelevance of these predictions to the merits of the legislative and judicial changes we have proposed.

Our proposal rests on three fundamental pillars. The first is that the innovation process is terribly important to economic growth and development, because it yields social returns in excess of private returns. Hence, antitrust policy, if it is going to err, ought to do so by being on the facilitating rather than on the inhibiting side of innovation. Second, economic theory tells us that if certain organizational arrangements are exposed to governmentally imposed costs while others are not, firms will substitute away from the burdened forms (in this context alliances) and in favor of the unburdened forms (in this context mergers), even if the former are potentially economically superior. Third, it is our contention that cartelization of high technology industries open to international trade and investment is practically impossible, and thus antitrust concerns are minimal since these industries remain open. These three contentions alone, if accepted, provide the foundation for our legislative proposals. Of course, the second and third criteria alone are sufficient, given the modest nature of our proposal.

Nevertheless, policy makers are inclined to inquire as to the opportunity costs associated with the existing law. We believe these are considerable, and likely to increase in the future. Unfortunately, it is impossible to describe the counterfactual with any degree of precision, and what we provide is not supported by any formal model. We contend that there are at least three classes of circumstances where beneficial cooperation will sooner or later take place if antitrust laws are revised along the lines we propose.

1. COOPERATIVE COMMERCIALIZATION AND MANUFACTURING

There are a number of circumstances where cooperative activity beyond early stage activity is beneficial. Sometimes this is true because of scale and risk considerations. Sometimes it is true because prohibition of cooperative commercialization imposes a significant technology transfer problem, for instance, from the research joint venture (if there is one) back to the parent company. In most cases firms will not wish to cooperate all the way from research through to commercialization. But in some instances they will, and when cartelization of the industry is not a threat, we see no reasons for antitrust restraints. At present there is

discussion of a U.S. consortium to develop and manufacture advanced (1-4 megabit) dynamic random access memories (DRAMs). With fabrication facilities costing \$200 million or more each to build, acting alone is beyond the financial resources of many companies who might otherwise wish to have some control over their DRAM supply. Such a consortium would probably be exposed to certain antitrust threats under existing law, depending on how the courts defined the relevant market and how they counted and assessed Japanese DRAM production capacity.²³⁵ However, under our proposed changes to the NCRA such a consortium would be looked upon favorably.

Similarly, in the area of superconductors, it is likely that the real challenges will come not so much in developing superconductors, but in their commercialization. Application of superconductors in systems, like railroads, computers, and electricity distribution, will require great amounts of time, resources, and capital -- probably greater than any single American business can muster. Accordingly, a public policy stance which treats only early stage activity as potentially requiring cooperation is misguided and will thwart both early and later stage activities. The reason is that most firms will not have much incentive to engage in early stage, joint development if later stage, stand alone commercialization appears too expensive given their expected resource constraints.

2. COOPERATIVE INNOVATION DESIGNED TO ACHIEVE CATCH-UP

Cooperative activities in Japan and Europe have frequently been motivated by a desire to catch up with the world's technological frontier, which in the post-war years was usually the technology of U.S.-based firms. Increasingly, however, U.S. firms are slipping behind the frontier. For instance, U.S. firms are now behind in areas like ceramics for semiconductor chips, and in products like VCRs, televisions, and facsimiles. Just as foreign firms have found cooperative ventures useful for catch-up in the past, U.S. firms could utilize cooperation for this purpose. For example, American firms, acting together, may still have a slender chance of competing in the market for high definition televisions expected to evolve in the 1990s. In the absence of alliances, we doubt that is possible. If American potential "reentrants" to the consumer electronics business combine to attempt reentry, they cannot be sure of avoiding serious antitrust problems involving treble damages.

235. If Japanese producers were considered to be effectively cartelized by MITI's implementation of a U.S.-Japan semiconductor trade agreement, a court could conclude that the relevant market was more concentrated than might at first appear to be the case.

At minimum, the changes we propose would facilitate unfettered information exchange and strategic coordination with respect to reentry strategies. If such efforts facilitated profitable reentry into high technology businesses when reentering would otherwise not occur, or would occur in a more limited and unprofitable way, we do not see why antitrust concerns ought to interfere, since cooperation in rapidly developing businesses poses no anticompetitive threat.²³⁶

3. STRATEGIC COORDINATION IN RESPONSE TO FOREIGN INDUSTRIAL POLICY

In high technology industries, both European and East Asian nations have active industrial policies which significantly impact market outcomes both in their own countries and abroad. Airbus is a case in point. The dominant U.S. attitude is one of *laissez faire*, and indeed many economists are of the view that the U.S. should send a letter of thanks to foreign governments who subsidize exports to the U.S. Such a view is insensitive to the dynamics of technological change, to the importance of cumulative learning, and to reentry costs.

Some policy makers in the U.S. who recognize the declining American competitiveness favor some form of retaliation. We propose instead a modification of U.S. antitrust laws which in some circumstances would permit a full competitive response by U.S. industry acting collectively. For instance, while we have not examined the full import of our proposals on the aircraft industry, we find it conceivable that Airbus's overtures to McDonnell Douglas, which may be designed to isolate Boeing and undercut its competitive position, could be forestalled by a strategic alliance between Boeing and McDonnell Douglas to develop new aircraft, and to coordinate certain technology and market strategies. American concerns would thus remain competitive in the global market while keeping McDonnell Douglas a viable business in its own right.

VII. CONCLUSION

Competition is essential to the competitive performance of the American economy, but so is innovation. The United States is a nation with tremendous innovative capacity. Innovation is what Americans do well, whether it be in technological, organizational, cultural, or political spheres. It is what has brought us wealth historically, and it is what underlies our wealth today.

However, changes in the post-war economy, including the globalization of markets, increased pluralism in the sources of new technology,

236. See *supra* Section III.A.

and enhanced foreign capacity to utilize technology developed here, create new challenges. In particular, innovating firms confront increasing difficulty capturing value from new ideas, products, and processes which they originate or fund. The mechanisms of intellectual property law -- patents, copyrights, and trade secrets -- in theory provide protection, but in practice are often unavailable or easily circumvented.

There is no easy remedy to this predicament. Declining American competitiveness in the world market has many causes, including, but not limited to, federal budget deficits and the inability of the nation to sustain and enhance a labor force with the requisite skills. Also detrimental is the hesitancy of the nation to question its ideology and to overhaul its institutions and policies.

One institution in need of renovation is the antitrust laws. The judicial and legislative proposals we make are designed to promote innovation and successful product commercialization and strengthen the competitiveness of U.S.-based firms in world markets by clarifying the legal standards applicable to cooperative innovation arrangements and by eliminating the threat of private treble damage actions.

The proposals reflect not only the changing conditions of global competition, but a deeper understanding than currently exists in antitrust law of the special requirements of innovation and the importance of strategic coordination to success in global markets. Innovation requires cooperation as well as competition. Our antitrust laws have evolved so that they permit cooperation achieved administratively within a firm but often not contractually between firms. We should now forthrightly acknowledge that cartelization is a remote possibility in industries experiencing rapid change, and that firms without significant market power should not be handicapped by antitrust concerns. Our proposals achieve these goals and put American firms on an antitrust footing more equal to that experienced by their trading partners, thereby removing our self-imposed burdens on industrial performance.

APPENDIX A

Legislative Proposal
By Professor Thomas M. Jorde
and
Professor David J. Teece,
University of California at Berkeley

**NATIONAL COOPERATIVE RESEARCH
AND COMMERCIALIZATION ACT (NCRCA)**

(As amended from National Cooperative Research Act (NCRA), 15 U.S.C. §§ 4301-4305 (Supp. 1986). Where possible, the NCRCA retains the language and structure of the NCRA.)

SECTION 4301. PURPOSES.

(a) THE CONGRESS FINDS THAT--

(1) technological innovation and its profitable commercialization are critical components of the United States' ability to raise the living standards of Americans and to compete in world markets;

(2) cooperative arrangements among nonaffiliated firms in the private sector are often essential for successful technological innovation and commercialization;

(3) the antitrust laws tend to inhibit cooperative innovation arrangements because of uncertain legal standards and the threat of private treble damage litigation;

(4) cooperative innovation efforts present little or no threat to competition when cooperating firms lack substantial market power, or when cooperative activity takes place in industries experiencing rapid technological change;

(5) the uncertainty of substantive antitrust standards and the potential delays of antitrust litigation are especially troublesome in fast paced industries experiencing rapid technological change; and

(6) present antitrust law unwisely treats mergers more favorably than more flexible, less permanent contractual and strategic relationships.

(b) It is the purpose of this Act to promote innovation and profitable product commercialization, facilitate trade, and strengthen the competitiveness of United States based firms in world markets by clarifying the legal standards applicable to cooperative innovation arrangements and by establishing a procedure by which firms may seek approval for their cooperative innovation arrangements from the Department of Justice, in consultation with the Secretary of Commerce, and thereby obtain exemption from criminal antitrust actions or civil antitrust damage actions.

SECTION 4301a. DEFINITIONS.

(a) FOR THE PURPOSES OF THIS CHAPTER:

(1) The term "antitrust laws" has the meaning given it in subsection (a) of section 12 of this title,

except that such term includes section 45 of this title to the extent that section 45 applies to unfair methods of competition.

(2) The term "DOJ" means Department of Justice and the term "FTC" means Federal Trade Commission.

(3) The term "Secretary" means the Secretary of Commerce.

(4) The term "person" has the meaning given it in subsection (a) of section 12 of this title.

(5) The term "State" has the meaning given it in section 15g(2) of this title.

(6) The term "cooperative innovation arrangement" means any group of activities, including attempting to make, making, or performing a contract, by two or more persons for the purpose of--

(A) theoretical analysis, experimentation, or systematic study of phenomena or observable facts,

(B) the development or testing of basic engineering techniques,

(C) the extension of investigative findings or theory of a scientific or technical nature into practical application for experimental and demonstration purposes, including the experimental production and testing of models, prototypes, equipment, materials, and processes,

(D) the collection, exchange, and analysis of research information,

(E) manufacturing, producing, marketing, distributing, or otherwise commercializing products, processes, or information developed jointly through activities (A)-(E) or by one or more of the persons in the arrangement, or

(F) any combination of the purposes specified in subparagraphs (A), (B), (C), (D), and (E),

and may include: the integration of existing facilities or the establishment and operation of new facilities for the conducting of cooperative work, the conducting of such venture on a protected and proprietary basis, and the prosecuting of applications for patents and the granting of licenses for the results of such venture.

(7) The term "market share" means the percentage of total market sales represented by a single market participant in a relevant market.

(8) The term "market power" means the ability to restrict output and/or increase prices above competitive levels in a relevant market.

(9) The term "Herfindahl-Hirschmann Index" (HHI) means the total of the squares of the market shares of all actual competitors in a relevant market.

(b) The DOJ or FTC, with the concurrence of the Secretary, may by regulation further define any term defined in subsection (a).

SECTION 4302. JUDICIAL STANDARDS TO BE APPLIED TO COOPERATIVE INNOVATION ARRANGEMENTS.

(a) RULE OF REASON

Cooperative innovation arrangements remain subject to the antitrust laws. However, in any action under the antitrust laws, or under any State law similar to the antitrust laws, the conduct of any person in carrying out, or in making or performing a contract to carry out, all or any part of a cooperative innovation arrangement shall not be deemed illegal per se. Such conduct shall be judged on the basis of its reasonableness, determined as specified under subsections (b) through (e) of this section.

(b) PRIMA FACIE CASE

(1) In any action subject to subsection (a), the plaintiff shall have the burden of showing that the defendants have, or threaten to have as a result of the challenged conduct, substantial market power in one or more relevant market(s). Plaintiff may fulfill this burden by--

(A) demonstrating--

(i) that the Herfindahl-Hirschmann Index (HHI) of any relevant market (including within that market, as a single firm, the cooperative

innovation arrangement) is, or imminently threatens to become, greater than 1800, and

(ii) that the formation of such arrangement increased, or imminently threatens to increase, the HHI of such market by more than 50; or

(B) demonstrating that the market shares of firms in a relevant market cannot be measured by reasonably obtainable data, and that there are only five or fewer firms (including the arrangement) currently participating in each relevant market that are capable, alone or cooperatively, of engaging in the type and scope of innovation and commercialization undertaken by the cooperative innovation arrangement in such market; and/or

(C) demonstrating that the conduct of the cooperative innovation arrangement has actually harmed competition and consumers by reducing output or increasing prices of products in any relevant market.

(2) In any action subject to subsection (a), if the plaintiff makes the showing required by paragraph (1), the defendants may introduce evidence that the plaintiff defined any relevant market in a manner inconsistent with subsection (c), and that such inconsistency resulted in an erroneous conclusion as to the applicable

Herfindahl-Hirschmann Index, market shares, or number of firms in such market.

(c) MARKET DEFINITION

In any action subject to subsection (a),--

(1) relevant markets shall be defined in a manner that reflects commercial realities, and will often involve know-how markets and product markets,

(2) relevant markets shall be defined in a manner takes account of the actual and potential competitors, both foreign and domestic, who, either alone or cooperatively, are capable of timely engaging in similar innovation and commercialization efforts,

(3) relevant markets shall be drawn with sensitivity to product features and performance characteristics, in addition to price elasticities, and

(4) relevant markets involving innovation are presumed to be global, unless evidence demonstrates a more narrow market is appropriate.

(d) REBUTTAL; DEFENSES

(1) In any action subject to subsection (a), if the plaintiff makes the prima facie showing required by paragraph (b)(1), the defendant or defendants may introduce evidence--

(A) that the cooperative innovation arrangement will produce procompetitive benefits and

efficiencies, and that any specifically challenged contractual provisions are justified because they are logically related to successful innovation and commercialization, and/or

(B) that the existence of potential competitors in any relevant market in which the cooperative innovation arrangement is shown to possess market power precludes potential anticompetitive effects that might otherwise be inferred from present market power.

(2) Evidence introduced under subparagraph (1)(A) of procompetitive benefits and efficiencies and their logical relationship to specific contractual restraints may include, but is not limited to, evidence--

(A) that the innovation sought by the arrangement will, if achieved, be inadequately protected under the patent, trade secret, or other intellectual property laws, and that contractual restraints, including the challenged conduct, are necessary in order to secure appropriability and prevent free-riding by rivals and opportunistic behavior by parties to the arrangement or by rivals,

(B) that the innovation sought by the arrangement is of such a character or magnitude that a cooperative arrangement will help achieve

the economies of scale and scope necessary to mount a successful research and commercialization effort,

(C) that successful innovation sought by the arrangement will be aided by cooperative or integrated commercialization, including the challenged conduct,

(D) that the arrangement will compete in a market or markets that are characterized by rapid technological change, or will be so characterized by the arrangement or others like it, and/or

(E) that the innovation sought by the arrangement will compete with other technologies in a preparadigmatic stage of competition for particular products or processes.

(e) ULTIMATE BURDEN OF PROOF

(1) In any action subject to subsection (a), the plaintiff shall have the ultimate burden of proving that the challenged conduct is unreasonable. In attempting to fulfill this burden, such plaintiff may, without limitation upon other approaches,--

(A) rebut any evidence introduced by the defendants under subsections (c) and (d); and/or

(B) introduce additional evidence of the defendants' market power in any relevant market, or of

anticompetitive harms caused by the challenged conduct, and/or

(C) introduce evidence that profitable commercialization, or procompetitive benefits or efficiencies offered by the defendants under subsection (d) could be achieved--

(i) by an existing firm or viable combination of firms with substantially less market power than that exercised by the cooperative innovation arrangement in question in any relevant market, and/or

(ii) by the parties to the cooperative innovation arrangement in an obviously and substantially less restrictive manner, and/or

(D) introduce evidence that the anticompetitive harms caused by the cooperative innovation arrangement outweigh the procompetitive benefits and efficiencies generated.

SECTION 4303. ATTORNEY'S FEES

(a) AWARD OF FEES TO PREVAILING CLAIMANT OR DEFENDANT

Notwithstanding sections 15 and 26 of this title, in any claim under the antitrust laws, or any State law similar to such laws, subject to section 4302, the court shall, at the conclusion of the action, award to the substantially prevailing party the cost of suit attributable to such claim, including a

reasonable attorney's fee, except as specified in subsection 4304(d).

(b) OFFSET OF AWARD

The award made under subsection (a) of this section may be offset in whole or in part by an award in favor of any other party for any part of the cost of suit, including a reasonable attorney's fee, attributable to conduct during the litigation by any prevailing party that the court finds to be frivolous, unreasonable, without foundation, or in bad faith.

SECTION 4304. APPROVAL OF COOPERATIVE INNOVATION ARRANGEMENTS.

(a) WRITTEN APPLICATIONS; FILING

(1) Any party to a cooperative innovation arrangement, acting on such arrangement's behalf, may, not later than 90 days after entering into a written agreement to form such arrangement or not later than 90 days after [EFFECTIVE DATE OF BILL], whichever is later, file simultaneously with the DOJ and FTC a written application disclosing--

(A) the identities of the parties to the arrangement,

(B) the nature and objectives of the arrangement, including description of procompetitive benefits and efficiencies to be achieved by the arrangement,

(C) the current market shares, in all relevant markets, of all parties to the arrangement,

(D) the estimated or predicted market share, in all relevant markets, of the arrangement, and the basis for the estimate or prediction (including an estimate of the effect of potential competitors on current or future market shares),

(E) the estimated concentration of all relevant markets, expressed in terms of the Herfindahl-Hirschmann Index; or, if market shares of participants in a relevant market cannot be measured by reasonably obtainable data, then in terms of the number of firms (including the arrangement) currently participating in each relevant market that are capable, alone or cooperatively, of engaging in the type and scope of innovation and commercialization proposed by the applicant, and

(F) the estimated or anticipated duration of the arrangement.

(2) Within ten days after an application submitted under paragraph (1) is received by the DOJ and FTC, the DOJ shall publish in the Federal Register a notice that announces that an application has been submitted, identifies each person submitting the application, and describes the cooperative innovation arrangement for

which the application is submitted, subject to the limitations specified in subsection (g).

(b) APPROVAL OF APPLICATIONS; FILING

(1) Market power safe harbor. The DOJ and FTC shall decide within 5 days of filing which agency shall conduct approval procedures. The DOJ or FTC shall approve an application filed under subsection (a) if it determines, with the concurrence of the Secretary,--

(A) that the arrangement will not possess substantial market power in any relevant market, and

(B) that the duration of the arrangement will not exceed limits reasonably required to accomplish the objective of the arrangement, and in any event will not exceed seventeen years.

(2) The DOJ or FTC may approve an application filed under subsection (a) if it determines, with the concurrence of the Secretary that, notwithstanding that the arrangement will possess substantial market power in a relevant market,

(A) the arrangement is reasonable, because the procompetitive benefits outweigh any anticompetitive harms, as determined under paragraph (5), and

(B) the scope and duration of the arrangement will not exceed limits reasonably required to accomplish the objective of the arrangement, and in any event will not exceed seventeen years.

(3) For the purposes of this section, the DOJ or FTC shall find that the arrangement possesses substantial market power in a relevant market if--

(A) the Herfindahl-Hirschmann Index of the relevant market (including within that market, as a single firm, the cooperative innovation arrangement) is, or imminently threatens to become, greater than 1800, and the formation of the arrangement increased, or imminently threatens to increase, the Herfindahl-Hirschmann Index of such market by more than 50; or

(B) the market shares of firms in the relevant market cannot be measured by reasonably obtainable data, and there are only five or fewer firms (including the arrangement) currently participating in each relevant market that are capable, alone or cooperatively, of engaging in the type and scope of innovation and commercialization undertaken by the cooperative innovation arrangement in such market.

(4) For the purposes of this section, the DOJ or FTC shall, when defining relevant markets, consider the factors set forth in subsection (c) of section 4302.

(5) For the purposes of this section, the DOJ or FTC shall, in determining whether a cooperative innovation

arrangement is reasonable, consider the following factors--

(A) the degree of market power possessed by the arrangement;

(B) whether the arrangement will harm competition and consumers by reducing output or increasing prices of products in a relevant market;

(C) whether the arrangement will produce, and whether there is a logical relationship between specific contractual restraints embodied in the arrangement and the achievement of, procompetitive benefits and efficiencies, evidence of which may include, but is not limited to, evidence--

(i) that the innovation sought by the arrangement will, if achieved, be inadequately protected under the patent, trade secret, or other intellectual property laws, and that specific contractual restraints are necessary in order to secure appropriability and prevent free-riding and opportunistic behavior,

(ii) that the innovation sought by the arrangement is of such a character or magnitude that a cooperative arrangement will help achieve the economies of scale and scope necessary to mount a successful research and commercialization effort,

(iii) that successful innovation sought by the arrangement will be aided by cooperative or integrated commercialization, including specific contractual restraints,

(iv) that the arrangement will compete in a market or markets that are characterized by rapid technological change, and/or

(v) that the innovation sought by the arrangement will compete with other technologies in a preparadigmatic stage of competition for particular products or processes;

(D) whether such procompetitive benefits and efficiencies could be achieved--

(i) by an existing firm or viable combination of firms with substantially less market power than that exercised by the arrangement in any relevant market; and/or

(ii) by the parties to the arrangement in an obviously and substantially less restrictive manner; and

(E) whether the existence of potential competitors in any relevant market in which the arrangement possesses substantial market power precludes potential anticompetitive effects that might otherwise be inferred from such market power.

(6) If the DOJ or FTC, with the concurrence of the Secretary, determines that approval is unwarranted under paragraphs (1) and (2), it may (with the concurrence of the Secretary) either deny approval or grant an approval conditioned on modification of the terms, scope, membership, and/or duration of the arrangement.

(7) The DOJ or FTC may, to assist in making any determination required by this subsection, hold, after publishing appropriate notice in the Federal Register, a hearing at which the applicant may present evidence pertinent to the determination in question.

(c) PUBLICATION; EFFECTIVE DATE OF APPROVAL

(1) Except as provided in subsection (h), not later than 60 days after receiving an application filed under subsections (a) or (f), the DOJ or FTC, with the concurrence of the Secretary, shall publish in the Federal Register a statement of the approval or denial of the application. Prior to its publication, the contents of such notice shall be made available to the parties to the arrangement. If the application is approved under paragraphs (b)(2) or (b)(6), such notice shall also include a summary of the DOJ or FTC's reasoning, a description of the terms of the approval, and a description of the activities and conduct within the scope of the approval.

(2) The DOJ or FTC may, prior to the expiration of the 60-day period specified in paragraph (1), require the submission of additional information or documentary material relevant to consideration of the factors set forth in subsection (b). If such information or material is requested, the period after which the DOJ or FTC must publish notice of approval or denial of the application shall be extended by 30 days.

(3) Approval of applications filed under subsections (a) or (f) shall take effect 30 days after notice is published under paragraph (1) or (2), except as specified in paragraph (4).

(4) If subjected to acceptance of conditions imposed by the DOJ or FTC under paragraph (b)(6) or judicial review (of the DOJ or FTC's denial of a petition for revocation pursuant to subsection (e)) under subsection (i), approval of applications filed under subsections (a) or (f) shall take effect--

(A) on the date on which a final judgment upholding such approval is announced, or

(B) if such approval is conditional or is modified by the court, on the date on which any party to the cooperative innovation arrangement submits to the court in writing a statement of its acceptance of all modifications required by the DOJ or FTC or the court.

(d) EFFECT OF DOJ OR FTC'S APPROVAL

No damages, interest on damages, costs, or attorney's fees may be recovered in any criminal or civil action based in whole or in part on conduct within the scope of a cooperative innovation arrangement approved by the DOJ or FTC (as upheld and/or modified by the court under subsection (i)) under the antitrust laws, or any State laws similar to the anti-trust laws, if such approval was in effect at the time of the conduct.

The remedy of injunctive relief, available under section 16 of the Clayton Act (15 U.S.C. 26), shall be available to challenge conduct that is outside the scope of the approval granted by the DOJ or FTC.

(e) REVOCATION

(1) At any time during which an approval granted by the DOJ or FTC is in effect, the DOJ or FTC, on its own initiative or after receiving complaints from the public, may investigate and review whether the approved cooperative innovation arrangement or any part thereof remains within the scope of and standards for approval under subsection (b). The review performed by the DOJ or FTC shall be informal and shall not include any public hearing.

(2) The DOJ or FTC shall revoke an approval granted under subsection (b) only--

(A) with the concurrence of the Secretary, and
(B) if it determines that the cooperative innovation arrangement in question, or any part thereof, has--

(i) utilized the approval to abuse a dominant market position, or

(ii) become unreasonable, as determined under paragraph (b)(5), and

(C) after notifying the parties to the cooperative innovation arrangement in question, providing such parties with a reasonable opportunity to present evidence relevant to the determinations made under subparagraph (B), and determining that such evidence fails to eliminate all grounds for revocation.

(3) If a revocation is granted under paragraph (2), the DOJ or FTC shall publish notice in the Federal Register of the revocation, including a statement of reasons therefore. Prior to publication of any notice published under this subsection, the contents of such notice shall be made available to the parties to the cooperative innovation arrangement in question.

(4) Revocations granted under paragraph (2) shall take effect 30 days after notice is published, except as subjected to judicial review under subsection (i). If subjected to judicial review, revocation shall take effect on

the date on which a final judgment upholding such revocation is announced.

(f) DURATION OF APPROVAL; APPLICATIONS FOR RENEWAL

The approval of cooperative innovation arrangements under this section shall, unless revoked pursuant to subsection (e), remain in effect for seventeen years, or a lesser term specified by the DOJ or FTC or a reviewing court, after which any party to such arrangement may submit an application for renewal. The application shall provide the information, updated, required under subsection (a), and shall be approved or denied pursuant to the procedure set forth in subsections (b) and (c). The protections afforded by the initial approval shall continue in effect until the date on which notice of approval or denial of the application for renewal is published.

(g) EXEMPTION; DISCLOSURE; INFORMATION

(1) Information submitted by any person in connection with applications for approval or petitions for revocation shall be exempt from disclosure under section 552 of title 5, United States Code.

(2) Except as provided in paragraph (c)(1) or as provided in paragraph (3), no officer or employee of the United States shall disclose financial, commercial, or technical information submitted in connection with applications for approval or petitions

for revocation if the information is privileged or confidential and if disclosure of the information would cause harm to the person who submitted the information.

(3) Paragraph (2) shall not apply with respect to information disclosed--

(A) upon a request made by the Congress or any committee of the Congress,

(B) in a judicial or administrative proceeding, subject to appropriate protective orders,

(C) with the consent of the person who submitted the information,

(D) in accordance with any requirement imposed by a statute of the United States, or

(E) in accordance with any rule or regulation promulgated under subsection (k) permitting the disclosure of the information to an agency of the United States on the condition that the agency will disclose the information only under the circumstances specified in subparagraphs (A) through (D).

(h) WITHDRAWAL OF APPLICATIONS

Any person who files an application under this section may withdraw such application before notice of approval or denial of the application is published under

subsection (c). Any application so withdrawn shall not confer the protections of subsection (d) on any person with respect to whom such application was filed.

(i) JUDICIAL REVIEW OF ACTION BY THE DOJ OR FTC

(1) If the DOJ or FTC approves, denies, or revokes any application filed under this section, any person aggrieved by such action may, within 30 days of publication of notice announcing such action, obtain a review of such decision in any United States court of appeals in the circuit wherein such person resides or transacts business, or in the United States Court of Appeals for the District of Columbia, by filing in such court a written petition praying that the action of the DOJ or FTC be modified or set aside.

(2) If, in any suit brought under paragraph (1), the court finds that the action of the DOJ or FTC is unsupported by substantial evidence on the record considered as a whole, it shall modify such action to bring it into compliance with the requirements of this section, unless doing so would materially alter the scope or structure of the cooperative innovation arrangement in question. The record shall include all evidence introduced by any party or collected by the DOJ or FTC in the course of approving such

arrangement and considering the applicable petition for revocation.

(3) Rules and regulations promulgated by the DOJ or FTC under subsection (k) shall be subject to the requirements set forth under chapters 5 and 7 of title 5, United States Code.

(4) Except as specified under paragraphs (1), (2), and (3), no action by the DOJ or FTC taken pursuant to this section shall be subject to judicial review.

(j) ADMISSIBILITY OF EVIDENCE

(1) Except as provided in paragraph (2), for the sole purpose of establishing that a person is entitled to the protections of subsection (d) of this section, the fact of application under subsection (a) and the fact of approval under subsections (b) and (c) shall be admissible into evidence in any judicial or administrative proceeding.

(2) No action by the DOJ or FTC taken pursuant to this section shall be admissible into evidence in any such proceeding for the purpose of supporting or answering any claim under the antitrust laws or under any State laws similar to the antitrust laws.

(k) RULEMAKING

The DOJ or FTC, with concurrence of the Secretary, shall promulgate such rules and regulations as are necessary to implement the requirements of this section.

SECTION 4305. DISCLOSURE OF COOPERATIVE INNOVATION ARRANGEMENTS; LIMITATION ON RECOVERY.

(a) WRITTEN DISCLOSURES; FILING

Any party to a cooperative innovation arrangement, acting on such arrangement's behalf, may not later than 90 days after entering into a written agreement to form such arrangement or not later than 90 days after [EFFECTIVE DATE OF BILL], whichever is later, file simultaneously with the DOJ and FTC a written notification disclosing--

(1) the identities of the parties to the arrangement, and

(2) the nature and objectives of the arrangement.

Any party to the arrangement, acting on the arrangement's behalf, may file additional disclosure notifications pursuant to this section as are appropriate to extend the protections of subsection (c). In order to maintain the protections of subsection (c), the arrangement shall, not later than 90 days after a change in its

membership, file simultaneously with the DOJ or FTC a written notification disclosing such change.

(b) PUBLICATION OF NOTICE

Except as provided in subsection (e), not later than 30 days after receiving a notification filed under subsection (a), the DOJ or FTC shall publish in the Federal Register a notice that identifies the parties to the arrangement and that describes in general terms the area of planned activity of the arrangement. Prior to its publication, the contents of such notice shall be made available to the parties to such venture.

(c) EFFECT OF NOTICE

(1) If, with respect to a notification filed under subsection (a) of this section, notice is published in the Federal Register, then such notification shall, notwithstanding section 15 of this title and in lieu of the relief specified in such section, operate to limit the recovery of any person or State entitled to recovery on a claim under the antitrust or similar State laws to the actual damages sustained by such person, interest calculated at the rate specified in section 1961 of Title 28 on such actual damages as specified in paragraph (2), and the cost of suit attributable to such claim, including a reasonable attorney's fee pursuant to section 4303 of this title if such claim--

(A) results from conduct that is within the scope of the notification, and

(B) is filed after such notification becomes effective pursuant to paragraph (4).

(2) Interest shall be awarded on damages recovered under paragraph (1) for the period beginning on the earliest date for which injury can be established and ending on the date of judgment unless the court finds that the award of all or part of such interest is unjust in the circumstances.

(3) This section shall be applicable only if the challenged conduct of a person defending against a claim is not in violation of any decree or order, entered or issued after [EFFECTIVE DATE OF BILL], in any case or proceeding under the antitrust or any similar State laws challenging such conduct as part of a cooperative innovation arrangement.

(4) The protections conferred by paragraph (1) shall take effect as of the earlier of--

(A) the date of publication of notice under subsection (b) of this section, or

(B) if notice is not published within the time required by subsection (b), after the expiration of the 30-day period beginning on the date the DOJ or FTC receives the applicable information described in subsection (a).

(d) EXEMPTION; DISCLOSURE; INFORMATION

Except with respect to the information published pursuant to subsection (b),--

(1) all information and documentary material submitted as part of a notification filed pursuant to this section, and

(2) all other information obtained by the DOJ or FTC in the course of any investigation, administrative proceeding, or case, with respect to a potential violation of the antitrust laws by the cooperative innovation arrangement with respect to which such notification was filed,

shall be exempt from disclosure under section 552 of Title 5 and shall not be made publicly available by any agency of the United States to which such section applies except in a judicial or administrative proceeding in which such information and material is subject to any protective order.

(e) WITHDRAWAL OF NOTIFICATION

Any person who files a notification pursuant to this section may withdraw such notification before notice of the cooperative innovation arrangement involved is published under subsection (b). Any notification so withdrawn shall not be subject to subsection (b) and shall not confer the protections of subsection (c) on any person with respect to whom such notification was filed.

(f) JUDICIAL REVIEW; INAPPLICABLE WITH RESPECT TO NOTIFICATIONS

Any action taken or not taken by the DOJ or FTC with respect to notifications filed pursuant to this section shall not be subject to judicial review.

(g) ADMISSIBILITY INTO EVIDENCE

(1) Except as provided in paragraph (2), for the sole purpose of establishing that a person is entitled to the protections of subsection (c), the fact of disclosure of conduct under subsection (a) and the fact of publication of a notice under subsection (b) shall be admissible into evidence in any judicial or administrative proceeding.

(2) No action by the DOJ or FTC taken pursuant to this section shall be admissible into evidence in any such proceeding for the purpose of supporting or answering any claim under the anti-trust laws or under any State law similar to the anti-trust laws.

