Do We Need New Competition Policy in the "New Economy"?

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Is today's "new economy" different from previous "new economies"? Not really; industries with high fixed costs, increasing returns to scale, network effects, and innovation races have been with us since the Industrial Revolution. Some commentators have recommended more relaxed antitrust enforcement in the new economy. This view has been grounded, i.a., on the "Schumpeterian" effect – monopoly rents drive investments in R&D – and on the dampening effect innovations have on the market power of currently dominant firms. However, recent research has shown that too little competition can also be detrimental to innovation. If one rewrites the recommendation as, "Are there some factors in the new economy that make it acceptable to conspire to fix prices or to reduce production, or to use market power to hinder entry and competition?", the answer is obviously, "No". Are there problems in applying antitrust in the new economy? Yes, but they are mostly practical.

1. Introduction

During the last few years, one has heard a lot about how the "new economy" differs from the old economy. In "old economy" industries, competition takes place primarily through traditional price or output competition on the margin and through incremental innovation. In contrast, in the new economy, industries undergo rapid technological change, competition centers on investment in research and development (R&D) and on intellectual property. In many of the new economy industries, firms engage in dynamic R&D competition to develop a "killer" product that will lead to market leadership and diminish or eliminate actual or potential rivals. Many of these industries also have "Schumpeterian" aspects – they experience "creative destruction", where innovation destroys old business models or entire industries and creates new ones. Successful investment in the creation of intellectual property typically results in significant scale and scope economies, leading to concentrated markets. The conclusion of the most enthusiastic writers is that old economic principles must be discarded, and new principles sought (see, e.g., Kelly 1997). If this were true, it would imply a total rethinking of competition, in terms of both business strategy and competition policy.

This article discusses competition policy in the new economy and is organized as follows. In Section 2, we briefly discuss competition policy and case law as found in the western world to provide some flavor of how competition policy operates. Section 3 discusses the new economy. In section 4, we discuss the challenges the new economy poses to competition policy. Section 5 has some concluding remarks.

2. The Purpose of Competition Law and Policy

The main goal of competition laws is to protect economic freedom and opportunity by promoting competition in the marketplace. Competition in a free market benefits consumers through lower prices, better quality, greater choice and more innovation. In the EU, competition laws are also used to promote the single market within the EU. In some countries, the purpose of competition laws is also to protect small and medium-sized enterprises. These other goals can in some cases be in conflict with the main goal.

Competition policy is one of the main instruments to ensure consumer welfare through allocative, productive and dynamic efficiency. According to Bork (1967), antitrust law must challenge inefficient conduct. A necessary (but not sufficient) attribute of inefficiency is the restriction of output below levels that would prevail under competitive conditions. Conduct not so identified must be presumed to enhance efficiency, and should not be the subject of legal sanction. However, this is not how the antitrust laws are designed, nor how case law operates.

Application of game theoretic methodology in industrial organization has shown that simple formulas for efficiency defined as net aggregate economic welfare (consumer + producer surplus) appear to be deceptive and misleading. With the various types of non-price competition, welfare becomes multi-dimensional and includes aspects such as quality, speed and security of supply, introduction of new products and services, etc. Most of these aspects are not measurable and value judgments are necessary. An example is whether allocating a greater amount of resources to R&D activities that result in technological change or product variation contributes enough to consumer welfare to outweigh the possible losses resulting from static inefficiencies. On the whole, a precise definition of the "efficiency" criterion is more apparent than real and most of the time requires a delicate appreciation of the complex trade-off.

Three principles seem to have inspired the European authorities in this matter. First, European authorities seem to have adopted the view that the rules of competition were not formulated to give protection to individual competitors but to uphold the competitive process, as is evident, e.g., from numerous speeches of EU Competition DG officials found on the website http://europa.eu.int/comm/competition/speeches/.

Second, the idea is not to strive for the realization of perfect competition but to promote "workable competition" – a process of rivalry that operates under conditions of uncertainty, in which firms cannot be sure about each other's strategies, by removing obstacles from the competitive process. This would ensure mobility of resources, the provision of alternative choices for producers and consumers, and the use of the best economic practices in production and distribution. "Workable competition" does not have solid theoretical foundations, unlike perfect-competition theory or modern game-theoretic oligopoly analysis, and implies a value judgement from the authorities. It describes market structures in which new technologies, organizational forms, preferences or products can arise and be developed without public or private restrictions.

Third, competition policy is viewed as an instrument to achieve a single European market without internal frontiers, a goal that can be in conflict with the idea of promoting economic efficiency. In the US, competition authorities seem to be somewhat more concentrated in promoting efficiency.

3. New Economy

The term "new economy" is often used to denote three industries: the manufacture of computer software, Internet-based businesses (Internet access, service and content providers) and the communications services and equipment designed to support the first two markets. We could, perhaps, also add the biotechnology field to that list.

The arguments as to why today's new economy is different from the previous new economies focus primarily on high fixed costs; increasing returns to scale or downward sloping supply curves at relevant output levels; network effects or demand-side scale and scope economies, often with a winner-take-(almost)-all outcome; and rapid change (see, e.g., Ahlborn et al, 2001; Bresnahan, 2000; Evans and Schmalensee, 2001; Katz and Shapiro, 1998; Koski et al., 2001; Shapiro, 2000; Shapiro and Varian, 1999).

The defining feature of new-economy industries is rapid change, in part due to the dynamic competitive process to create intellectual property through R&D (Katz and Shapiro, 1998). Modern economies have undergone a transformation in the last 20–30 years that has resulted, in many industries, in "creative destruction" and increased investment in innovation. For instance, many of the companies on the list of the largest US companies in 2000 (by market capitalization) did not even exist in 1970, including Microsoft, Cisco Systems, and Oracle (Evans and Schmalensee, 2001).

Network Effects

Network effects occur when products are more valuable to purchasers or consumers the more widely they are used, as first analyzed by Rohlfs (1974). Such effects can arise in two ways: in "real" networks such as telephones or the Internet, network effects come from interconnection or interoperability. For example, a single telephone is more valuable the more phones there are that can be accessed. In "virtual" networks, network effects arise as there is an increase in the number of complements available in the market for that product or service due to the larger customer pool. For instance, all VHS players or computers running Windows 2000 make a virtual network. In all cases, the use of common standards plays a critical role in linking network users. (Economides, 1996; Katz and Shapiro, 1998; Koski et al., 2001; Rubinfeld and Hoven, 2001)

Network effects are a source of scale or scope economies in consumption and thus tend to produce markets with at most a small number of clear leaders, making it difficult for firms with small shares to survive unless they produce significant innovation. These demand-side economies of scale are also present when consumers must choose durable hardware devices to be used with particular software. By buying a particular hardware component, each consumer forms expectations about the availability and variety of compatible software. The larger the network of users of a particular software format, the higher the value consumers attach to the hardware that uses this format. This hardware/software paradigm applies to many markets in the information economy: credit-card networks, VCRs and videocassettes, etc. (Katz and Shapiro, 1985).

Many of the high-technology industries that have emerged in the last 20–30 years have significant network effects. A PC that runs on Windows software is more valuable to a consumer the more other consumers use this standard. Software developers will invest more in writing applications for this standard, making it more likely that customers will have the applications they desire. Also, use of a common standard makes it easier to exchange files (such as text documents or spreadsheets) with each other.

Firms that are not leaders in network industries generally have little hope of reaching that status unless they come up with an innovation that can defeat the natural advantage created by network effects on the industry leaders. Similarly, the possibility of being displaced by a major innovation will guide the leaders' R&D strategy. If there is a chance that today's products will be replaced by a major innovation, a leader's survival depends on bringing that innovation to market and thereby replacing itself before others do. As a result, competition in network industries often involves R&D-races aimed at capturing or retaining market leadership (Evans and Schmalensee, 2001; Ahlborn et al., 2001).

Low-Marginal Costs and High Fixed Costs

Firms in new economy industries often must invest great sums to develop their products, either because they must make substantial investments in R&D, or because they must invest in a physical or virtual network to create and deliver the product. But once they make this initial investment, it is cheap to produce additional units for sale. The cost of producing another copy of software, or the cost of producing another microprocessor, once the facility has been set up, is minuscule. That is, production in new-economy industries exhibits increasing returns (Katz and Shapiro, 1998).

Innovation as Winner-Take-(Almost)-All Race

Competition in some high-technology industries involves sequences of races to develop a new product or to replace an existing product through drastic innovation. In the initial race, firms invest heavily to develop a product that creates a new category or becomes an early

leader in a new category – the Palm Pilot, VisiCalc spreadsheet, WordStar word processor, and Quicken financial software are examples.

Economic theories have produced numerous models of races of this sort. In most of this literature, an industry is assumed to have exactly one race, after which the winner enjoys a monopoly position forever. These models have suggested that also real-world industries become stable monopolies after an initial burst of dynamic competition; obviously, this need not be the case. There are also some models that look at ongoing dynamic competition (e.g., Aghion et al., 2002).

In some high-technology industries there are many sequential races for market leadership. Major innovations occur repeatedly, and switching costs and lock-in do not prevent displacement of category leaders by better products (Evans et al. 1999). It is not impossible for a fringe firm that invests heavily to displace the leader by leap-frogging the leader's technology. Microsoft Windows is one example. Windows was only the 4th GUI OS introduced, after Apple's Lisa and MacIntosh, VisiCorp's VisiOn and Digital Research's GEM. At the time Windows 1.0 was being developed, also IBM promised to introduce GUI on its multitasking program manager Top View, a promise that was never kept as the Top View program was eventually discontinued.

These winner-take-all races arise for two related reasons discussed above. First, network effects create positive feedback for firms that are first to have many satisfied customers. When a firm attracts additional customers, the value of its product increases, making it easy to attract even more customers. Second, if there are scale economies at the firm level, e.g., because of high fixed costs, making more sales enables firms to reduce their average costs and to make high profits while charging low prices (Rubinfeld and Hoven, 2001). In some high-technology industries, network effects and scale economies are strong enough to induce the firms to give their products for free, both to gain market penetration and to affect the evolution of technical standards. Netscape browser is one good example of this.

Of course, there is no guarantee that competition through races for drastic innovations will continue indefinitely. In the U.S. automobile industry, an initial period of rapid innovation and product development was followed by several decades of comparative stability. One might have described the early 1900s car manufacturing industry as Schumpeterian, but not the 1950s (Evans and Schmalensee, 2001). The same may be true, e.g., for future or current software markets.

Innovation Competition and Goods Market Competition

Following Schumpeter (1943), it is often argued that monopoly will generate more innovation than aggressive competition for at least two reasons. First, monopolistic firms, having a higher cash flow and facing less market uncertainty, can more easily fund R&D investments. Second, monopolists have more incentives to undertake such investments since the prospect of monopolistic rents is more attractive than that of competitive ones. This assumption is at odds with the principle of profit maximization, which assumes away any unresolved conflict between investors (shareholders) and firms (managers). This argument can be balanced by Arrow's (1962) replacement effect: a new competitor considers the entire expected profits attached to an innovation, while an incumbent firm only considers the additional profits attached to the same innovation. The latter can be much lower than the former, e.g., if the innovation consists of a new product or process that replaces one already manufactured or used by the incumbent firm.

The literature on R&D races has yielded ambiguous results as to the impact of competition on innovation and economic developments (see Aghion and Howitt, 1997a,b for an overview of this "Schumpeterian" literature). If the prospect of monopoly rents is what drives firms' investment in R&D, and thus generates economic growth, product market competition can be detrimental to consumers' interests; similarly, the risk of imitation discourages innovation and growth, hence the importance of intellectual property rights and patent systems.

However, as shown by Aghion et al. (2001, 2002), the conclusion depends crucially on fine assumptions of the R&D race game. Whereas most of the literature focuses on "leap-frogging" innovations, Aghion et al. shows that a more gradualist, "step-by-step", technological

approach emphasizes the positive impact of competition. If during the technological race, two firms end up having the same technology and end up in aggressive price competition, from which they are eager to get out of, they will want to invest even more in R&D. Then, a more competitive framework leads firms to invest more in R&D and thus fosters innovation and growth. Recent work in the endogenous growth literature (e.g., Aghion and Howitt, 1997a, b) has validated this insight.

Aghion et al. (2001, 2002) extend the theoretical analysis by allowing several firms to innovate. In these models, innovation incentives depend upon the difference between post-innovation and pre-innovation rents. In this case, more intensive product market competition may end up fostering innovation as it may reduce a firm's pre-innovation rents by more than it reduces its post-innovation rents. In other words, competition may increase the incremental profits from innovating, and thereby encourage R&D investments aimed at "escaping competition". This effect is larger in more "neck-and-neck" industries, i.e., in industries in which oligopolistic firms face more similar production costs.

This more general model generates four predictions. First, the relationship between product market competition and innovation is an inverted U-shape: the escape competition effect dominates for low initial levels of competition, whereas the Schumpeterian effect (more competition reduces innovation as the laggard's reward to catching up with the technological leader may fall) dominates at higher levels of competition. Second, the equilibrium degree of technological "neck-and-neckness" among firms decreases with the intensity of product market competition. Third, the higher the average degree of "neck-and-neckness" is in an industry, the steeper is the inverted-U relationship between product market competition and innovation in that industry. Fourth, this model predicts that the escape competition effect should also be stronger in industries where firms' managers face harder budget constraints. As a result, firms with higher debt/cash-flow ratios may innovate more for any level of product market competition. Aghion et al. (2002) finds that these predictions accord well with observed behavior in their data. Their most striking finding is a strong inverted U relationship. The result seems to suggest that both too much and not enough competition is detrimental to innovation.

Ahn (2002) reviews recent studies on the links between competition, innovation and productivity growth in the long run. The main findings include that the positive impact of competition enhancing polices cannot be fully appreciated by measures of static efficiency gains in the short run. Competition has pervasive and long-lasting effects on economic performance by affecting economic actors' incentive structure, by encouraging their innovative activities, and by selecting more efficient ones from less efficient ones over time.

The claim that market concentration is conducive to innovation does not appear to be supported by recent empirical findings. On the whole, however, there is little empirical support for the view that large firm size or high concentration is strongly associated with a higher level of innovative activity. A large number of empirical studies confirm that the link between product market competition and productivity growth is positive and robust.

Analyses based on micro data show that firm dynamics (i.e., birth and death, growth and decline of individual firms) is an important component of innovation and aggregate productivity growth. Dynamic efficiency gains from product market competition, however, can hardly be achieved without well-functioning factor markets which reallocate labor and capital from shrinking/exiting firms to entering/growing firms. An increasing number of empirical studies suggest that there exist considerable interactions between product market competition and competition in labor and capital markets (see Ahn, 2002, for references).

Gans et al. (2002) suggest that the extent to which dynamic competition is important varies across technology-intensive industries. There are two routes to earn returns on innovation: through dynamic product market competition, in which the innovator develops a new product and then competes against the incumbents, or by selling the innovation in a "market for ideas", i.e., cooperating with the incumbents through licensing, strategic alliances, or acquisition. They find that the probability of cooperation increases with the strength of intellectual property rights, lower bargaining costs, and the

relative cost of control of specialized complementary assets. The authors suggest that we can observe the former in many areas of the electronics industry and computer software and the latter in the pharmaceutical industry.

High Ex-Post Profitability

For firms to be willing to engage in dynamic competition, they must expect to earn competitive rates of return on their R&D investments. These investments are risky for many reasons, and with some probability, the firm's R&D spending will produce no returns at all. For its expected rate of return to be competitive, it must be the case that if these investments succeed, they at least temporarily produce enough market power to yield an ex post supra-competitive rate of return.

In dynamically competitive industries, entrepreneurs and financiers recognize that many will try and most will fail. In the aggregate, we expect that entrepreneurs and investors will keep investing until the expected rate of return, adjusted for risk, is equal to what they can get elsewhere in the economy. But these investments will fund many enterprises that do not succeed. Observed returns are thus highly skewed: successful firms earn high rents on their innovations while unsuccessful projects do not survive in the marketplace or may never even produce marketable goods.

Similarly, because of network effects and scale economies, high-technology industries generally have a small number of relatively large firms at any point in time. In fact, in many new-economy industries these features may result in a single firm having the bulk of industry sales at any point in time (Ahlborn et al., 2001).

Does Today's New Economy Differ from Past New Economies?

Despite the above discussion, one can ask whether today's new economy really is all that different from past new economies. The answer seems to be, "not really". First, industries with high fixed costs have already been with us. Examples include railroads, aluminum, steel, automobile manufacturing, airlines, telephones, television and radio, and electric power. Second, many markets exhibit increasing returns to scale at the relevant level of output: any industry subject to significant scale economies will almost by definition exhibit increasing returns (local telephone service and electric power transfer). Third, products and industries where the addition of an incremental user enhances utility for other users are not restricted to the new economy. Old economy examples include the telephone, fax machine, and VHS VCRs, to name a few. Fourth, the speed of change is a subjective matter.

4. New Economy Challenges for Competition Policy

New features of dynamic competition for the market (i.e., competition between different systems to become the standard in a new market based on new technology) raise new challenges for policymakers. Do we need to rewrite competition laws to suit the new economy? Do we need to rethink the principles applied in antitrust case law?

There are at least two types of attitudes on this issue. The antitrust agencies have sometimes viewed new economy industries as particularly susceptible to breakdowns in competition and thus deserving of particularly close antitrust scrutiny (e.g., Klein 2000; Pitofsky 1999; Baer and Balto 1999; and Rubinfeld 1998). Some – in particular Microsoft's advisors in the *U.S. v. Microsoft* antitrust case – have expressed doubt as to whether there is any substantial role for antitrust to play in the new economy (e.g., Ahlborn et al., 2001; Breshanan 1999, 2000; Evans and Schmalensee, 2001).

Network Effects and Antitrust Analysis

Traditional analysis assumes that a product's intrinsic value is the main source of benefit to consumers. Network products create value by integrating products, businesses, and consumers into networks. In those networks, a single product or service has little or no value in isolation, but generates value when combined with others. This tends to create dominance; to "tip" the market to the direction of the firm that is the first to reach significant early success. Further, when a product in a network industry achieves dominance, producers of complementary products (such as software firms that write programs for a dominant operating

system) overwhelmingly tailor their products so that they can be used only with the dominant system.

Markets with substantial network externalities are rather different from more traditional markets. Most importantly, compatible standards are essential for integrating the complementary products. However, the introduction of a new standard has to overcome at least three impediments. First, consumers have to coordinate their decisions about which standard to adopt. Second, suppliers of complementary products have to coordinate a particular standard design and have to find ways to overcome the chicken-and-egg problem of introducing the standard in the market. For example, videocassettes and VCRs are strong complements and are subject to network externalities. To market the VCR, consumers have to be convinced about the availability of cassettes in the future. Integration is one way to overcome this coordination problem; an example is Nintendo selling an entire system of a machine and proprietary games. Third, the adoption of a new standard is often associated with considerable up-front investments, which creates lock-in and the fear of being orphaned in a losing technology.

Network externalities and first-mover advantages pose special risks that markets will "tip" very quickly in favor of a dominant incumbent, and entry of new and superior technology may be hard to achieve, as users of the established standard are reluctant to incur the costs of switching to the new technology. As a result, the market success of a competitor's product will depend not only on its inherent attributes (such as price and ease of use) but also on its ability to interface seamlessly with the dominant product design (Röller and Wey, 2001). Competition agencies may need to pay particular attention to questions related to open architecture – the freedom of potential competitors to utilize the dominant network or standard – and contestability – basically, barriers to entry.

The nature of competition in network-intense industries differs substantially from old economy types of industry, where the law of diminishing returns of scale prevents an industry from being driven permanently into complete monopolization. While market power in the old economy is usually attributed to the degree of concentration and entry barriers, market power in the new economy depends crucially on the intensity of network effects, the size of the installed base, users' switching costs, and the degree and ease of compatibility granted to competitors. In old economy, when several product designs compete, theory proposes a stable outcome in which typically many brands are supplied. With network externalities, however, the typical outcome is for one good to take over the entire market (Shapiro and Varian, 1999).

The public good character of networks gives a convincing efficiency rationale for arrangements that secure the appropriation of rents from investments into establishing a standard technology in the marketplace. In particular, mergers and strategic alliances can help to solve coordination and up-front investment problems, and hence, may unfold substantial efficiency enhancing effects. For example, a monopolistic sponsor of a network technology may have strong incentives to make the necessary investments to overcome critical mass and chicken-and-egg problems, while in a competitive market environment free-rider behavior may eliminate those incentives. Concentration of supply also reduces the users' concern of investing into the "wrong" system that might not be used in the future when a new system enters the market. Finally, concentration and barriers to entry due to installed base effects also reduce the likelihood of socially inefficient price wars between suppliers of incompatible products; an issue of particular concern in a winner-takes-it-all market. (Röller and Wey, 2001.)

Monopolization, however, gives also rise to negative welfare effects. Single sponsorship may lower consumers' willingness to adopt the monopolistically controlled standard as a monopoly may raise prices after consumers are locked-in. The dominant supplier of the industry standard has strong incentives to keep competing systems incompatible.

Above we have argued that there maybe benefits to market power in network industries, due to network externalities, supply-side economies of scale, the need for coordination, and chicken-and-egg problems. There may be several factors that render an industry closer to a natural oligopoly or monopoly, since traditional economies of scale on the cost side are complemented by economies of size on the demand side. In that sense, competition policy in the new econ-

omy is becoming more complicated, as authorities have to balance the increasing economies of size with the problems of dominant position. Authorities also need to consider whether firms can achieve these economies by alternative means that are less restraining on competition, such as licensing, second souring, or reputation building to introduce network externalities. Horizontal cooperation within strategic alliances or standardization committees may also help to overcome coordination and incentive problems. (See also Röller and Wey, 2001.)

Antitrust agencies may also have rather imprecise or contradictory information regarding emerging technologies. Because of the nature of competition in network industries, the informational and time constraints, antitrust authorities face a delicate problem when deciding about a merger.

Moreover, there may be several controversial issues where antitrust authorities could disagree over in an international context. First, there could be genuine disagreement over how to balance the natural oligopoly factors with problems of dominant position in merger or exemption cases. Second, the nature of competition in network industries is about standard setting and does involve some form of market power. Then national interests may come to play when domestic firms attempt to create an international standard. Since antitrust decisions in markets with network properties affect the setting of national and global standards with long-lasting effects, the role of international competition policy coordination becomes more prominent. (Röller and Wey, 2001.)

Static and Dynamic Competition in Antitrust Analysis

Schumpeter described dynamic competition that centers on drastic innovation as the "perennial gale of creative destruction" sweeps away the old economic order. He noted the importance for consumer welfare of "competition from the new commodity, the new technology which strikes not at the margins of the profits of the existing firms but at their foundations and their very lives". Recently, this has been taken seriously and formally modeled, e.g., by modern growth theory (e.g., Aghion and Howitt 1997a,b).

In contrast, most economics texts and antitrust casebooks treat perfect competition as the welfare-maximizing market structure and treat departures from this structure as problematic. Antitrust analysis has historically taken departures from textbook perfect competition as signs of possible competitive problems that may call for intervention. In practice, almost all antitrust analysis has been based on the structure-conduct-performance –-paradigm that seeks to determine the extent to which an industry lies between the extremes of perfect competition and monopoly. Antitrust analysis has paid particular attention to high market shares, since a large number of relatively small firms is a key feature of perfect competition. Static, perfectly competitive market structure cannot persist in many new economy industries. Similarly, leaders in many new economy industries generally set prices well above marginal cost and enjoy high ex post rates of return even when R&D competition is intense.

The current method of analyzing market power begins with definition of relevant markets. A relevant market comprises all those goods and services which the customer regards interchangeable or substitutable. A general rule is that if a large amount of demand is diverted from good A to B when the price of good A is permanently increased by 5–10 %, only then do A and B belong to the same market (there are few exemptions: also the goods substitutable by the producers may belong to the same market). By focusing on static demand-side substitution, competition authorities may fail to recognize a main competitive constrain for a new economy firm: new superior products resulting from uncertain innovations.

In some high-tech industries, network and other positive feedback effects make competition between different systems/networks fierce in dynamic sense. Signs of relaxed competition in the static measures – high concentration ratio, high price-cost margin, etc. – might hide vigorous competition in the dynamic sense. Further, by focusing on static measures such as market share, strong market power is seen by authorities, even if dynamic competition is healthy and static market power is controlled by dynamic competition. Equating high market share with dominance can then be potentially dangerous on innovation. (Ahlborn et al., 2001) The minimum the authorities should also be concerned

with is the possibility of entry and other potential competition, i.e., contestability of the markets.

For a firm with an established position in a high-tech industry, competition in the long run may come from firms selling complements in the present; e.g., Windows OS may be challenged by web browser and java. The complementor, knowing his partner's business and technology, is a potential entrant, and by cooperating also with partner's rivals, may act to reduce barriers to entry. The complementor's products may take on some of the functions of the partner's products, engaging in "partial entry". Whenever new technical progress consists of the invention of new functionalities, there can be dynamic rivalry, even if there is complementarity in the present. Finally, a strong present complementor may be able to gain widespread distribution where a direct present competitor would not. This can make establishment of the strong complementary position a key first step in the entry process.

The importance of future competition from current complementors then lies in four points, which all are related to the network effects. First, competition from complementors can end locked-in positions by weakening entry barriers. Second, if a complementor gains widespread distribution, it can be the beginning of leapfrog competition that takes the market to new technological bases. Third, competition set off by a complementor can take root quickly, while the other available entry routes are slow. Fourth, the choices opened up by rivalry between current partners offer opportunities for customers to influence the direction of technical progress. The important issues for competition policy in high tech industries may be more in enabling opportunities to lower entry barriers to allow leapfrog competition and rivalry over the long run than in concern about literal cooperation among existing horizontal competitors.

There are three major implications for competition policy analysis. First, the expectation of significant market power for some period of time is a necessary condition for dynamic competition. If dynamic competition is healthy, the presence of short-run market power is not an indication of competition problem, but a consequence of network effects and other new economy characteristics. Second, one expects leading firms in new economy industries to earn high profits. It is natural for successful firms to have high ex post rates of return, even after adjusting for risks, as discussed above. Third, although static price competition is rarely vigorous in new economy industries, the key determinant of the performance of these industries is the dynamic competition (Evans and Schmalensee, 2001).

Innovation Markets

One vehicle to take the dynamic competition aspects into account was the invention of the concept of "innovation market" by Gilbert and Sunshine (1995a,b). An "innovation market" is defined as "the research and development directed to particular new or improved goods or processes." The aim of this approach is to introduce dynamic considerations into antitrust analysis, to recognize the importance of innovation as a means of non-price competition and a source of welfare gains, and to prevent mergers that would reduce competition in innovation. Since 1994, the DoJ and the FTC have challenged several mergers in high-technology fields on the basis of innovation-market theory. To my knowledge, none of these cases has gone to trial.

While innovation market approach pays some attention to sources of innovation, its implementation has been heavily criticized (e.g., Hay 1995, Rapp 1995, and Hoerner 1995), for good reasons. For instance, what are close substitutes for a "product" on an innovation market; the connection between concentration and output on innovation market is problematic, as discussed above; there is a lack of connection between R&D inputs and innovation; and the capacity to innovate is hard to monopolize. In EU case law, the innovation market idea has not been used, but rather the effects on innovation are analyzed in an *ad hoc* manner, e.g., using the notion of potential competition.

However, the need for antitrust enforcement will remain important as firms may try to use anti-competitive practices to forestall competition from new entrants, have opportunities to exploit their market power to the detriment of competition, or engage in other anti-competitive activities.

Do We Need Special Competition Policy Treatment for New Economy?

As discussed above, many observers have made arguments about network effects, persistence of competitive advantages and market power. Regulation-oriented people tend to emphasize the lock-in aspects of persistent dominant positions, while laissez faire minded emphasize the increasing returns elements and the related efficiencies. There are seed of mistakes in both. A part of the mistake is to know what the "right" market outcome is and how to use antitrust policy that leads to it. On former, this takes the form of "knowing" that there is a tendency to wrong market outcomes; on the latter, it takes the form of "knowing" that the markets will have found the right structure even if that is highly concentrated and persistent (Jacobson, 2001).

Both of these arguments err in assessing the difficulty of figuring out the right market outcome in high tech industries. Both also miss the proper role of competition policy: to ensure that market processes are unencumbered by the activities, which prevent the best available market experiment from being conducted. Competition policy should be concerned with actions that impair the competitive process, rather than with deciding what the right market outcome should be.

The issue of lock-in and the possibility of an inferior technology winning are used as something of a "red herring" by both sides, as argued by Jacobson (2001). On the laissez faire side, people point out that there is actually supply of some things subject to network externalities, e.g., fax machines, and adduce this as evidence that we should not worry about lock in at all. On the regulation-minded side, people suggest that the existence of dynamic network effects raises the dangerous likelihood of bad market outcomes, and that this somehow is the clue to the analysis. Both of these arguments are confused for two reasons. First, for antitrust intervention, one needs is that the lock-in is something of an entry barrier, but not a totally insurmountable entry barrier. When that is true, it is possible that existing firms are protecting themselves from competition and entry. Second, one should not confuse market outcomes with market process – the gaining or maintaining of market power by anti-competitive acts. When network effects contribute to market power, the question of whether that market power is by the "wrong" technology or the "wrong" firm is not part of antitrust analysis. If the firm with market power prevents competition by entrants or reduces competition, one should look whether the new competition thus evaded is valuable for consumers, not whether the old situation was bad for them.

A part of the argument against vigorous competition policy in new economy is that antitrust rules may discourage innovation by diminishing the rewards from their inventions, and that a market may rapidly change with entry of firms using entirely new technologies. This is an old argument, too. Calls for a new economy exception to antitrust are almost as old as the antitrust laws themselves. The very first Sherman Act case decided on the merits by the Supreme Court, Trans-Missouri Freight Association in 1897, was defended on the basis that the high fixed costs in the railroad industry would lead to ruinous competition that the defendants had a right to prevent (Jacobson, 2001). In the more recent version of this argument, high tech monopolies will be eroded over time by new innovations, and monopolies tend to innovate more vigorously due to scale economies in R&D and a greater opportunity to exploit the value of the innovations made. This Schumpeterian view has been challenged, as discussed above. On an empirical basis, the arguments of the new economy proponents have relatively meager support. There certainly is no consensus that application of ordinary antitrust rules retards innovation generally, and a substantial body of data suggests that unchecked market power impairs rather than enhances long-run innovation (Baker, 1995; Gilbert and Sunshine, 1995b).

It has become routine for both USA and European authorities to challenge mergers in which the market has not yet emerged but where its emergence is foreseeable. The view of the agencies is that competition in future markets is well within the scope of legitimate antitrust protection, which is clearly sound competition policy. Any "new economy exception" requires a stronger argument than a fear that application of basic antitrust concepts will diminish some unspecified incentive to innovate.

5. Conclusions

Is today's new economy really that different from the past new economies? Probably not. Even if new economy really is somewhat different, do we need to rethink competition laws or policy? In other words, Is the new economy so different to allow practices that restrict output, create or enhance monopoly power, or raise artificial barriers to new competition? The obvious conclusion is "No."

Competition policy can play an important role in ensuring that consumers gain the benefits of new technologies and protect against those who might seek to suppress the development to protect their traditional advantages or alternatively use technology to engage in anti-competitive conduct. The laws in Western world are flexible enough to deal with new economy issues, and the basic idea behind the competition policy – to protect economic freedom and opportunity by promoting competition in the marketplace – is a sound and flexible enough policy goal for competition authorities to follow.

Are there problems in dealing with new economy competition cases? Yes. Some of the problems are more specific to new economy issues, while some are fairly common to all casework. Many of the challenges are practical in nature: authorities receive only limited and contradictory information, they must conduct forward-looking analysis, they must decide when intensive competition is predatory and when innocuous, etc. Some of the challenges are more acute in new economy. In any event, antitrust, especially in the context of merger enforcement, has already been involved with predictions of future effects. The more uncertain the future may be, the greater the need for caution rather than intervention. Consequently, the more dynamic the market, the more certainty should be required before intervention. In this essay we have not dealt with questions related to conducts such as bundling, price discrimination, or predation in new economy. Many rules of thumb that have evolved in old economy might need to be revised, but not the basic idea behind competition policy.

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