Chapter 11

Antitrust Issues in Dynamic Markets

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I INTRODUCTION

Many high-tech sectors are characterized by extreme dynamism in the strategic choices and entry choices of the firms. In these markets it is important to invest appropriately in R&D and to prepare new products, or to enter or exit from the market at the right moment and to foresee and react to the endogenous entry threats in the right way. This is somewhat different from traditional static sectors where the strategies for the existing products are crucial and entry is a slow phenomenon that can be often regarded as exogenous. Different markets require also different policies. A recent field of industrial organization has proposed a new approach to antitrust issues that is based on the analysis of endogenous market structures (EMSs) and that is particularly relevant for the modern dynamic markets.[1] The term 'endogenous' referring to a phenomenon taking place within an economic system, means that this phenomenon is caused and explained by factors inside the system. Accordingly, the endogenous entry approach clarifies which factors are inducing firms to enter into a market, rather than keeping entry as an exogenous phenomenon. Therefore, the size and the composition of the market are determined

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1. For a survey, see F. Etro, *Competition, Innovation, and Antitrust* (New York and Berlin: Springer, 2007).

Ioannis Lianos and Ioannis Kokkoris (eds), *The Reform of EC Competition Law: New Challenges*, pp. 327–341.

by technological constraints and demand conditions where both the strategies of the firms and their entry decisions are the fruit of profit maximizing decisions. Of course, when entry is endogenous, all the strategies of the firms are affected in non-trivial ways, and the behaviour of market leaders, the decision to merge, and the price-fixing agreements can be studied under a different light. The important aspect for antitrust issues is that the EMS approach has reached conclusions that are in the same spirit as the Chicago school, which has been traditionally associated with laissez faire ideals, and against the so-called post-Chicago approach, which has been dominant among policymakers in the last two decades and typically has been in favour of a more pervasive role of antitrust policy.[2] In this article I will review this recent literature and propose a critical view of the post-Chicago approach to antitrust policy. While my focus will be mainly on abuse of dominance, in the next section I will first overview the general implications of the EMS approach for general antitrust policy. In the following sections I will draw policy implications for a reform of EU competition policy with particular reference to predatory pricing and innovation policy. Finally I will apply some of the arguments to understand a specific dynamic market, that of online advertising, and will conclude.

II ENDOGENOUS MARKET STRUCTURES AND COMPETITION POLICY

Let us start with the implications for abuse of dominance issues, which require an understanding of the behaviour of leaders under different market conditions. The EMS approach has shown that whether entry in a market is exogenous or endogenous greatly influences the way leaders behave. In markets where entry is independent from the profitability conditions (i.e., entry is exogenous), market leaders can adopt accommodating strategies aimed at increasing prices or aggressive strategies aimed at reducing prices in order to exclude rivals. Both of these choices can harm consumers. When entry is endogenously dependent on profitability conditions in the market, leaders always adopt aggressive strategies which typically do not harm consumers, precisely because this is the optimal way to react to (endogenous) entry.[3] For instance, a firm competing with a single rival could engage in accommodating pricing to increase mark-ups, or could engage in

2. For Chicago school, see R. Bork, *The Antitrust Paradox. A Policy at War with Itself* (New York: The Free Press, 1993) and R. Posner, *Antitrust Law* (Chicago: University of Chicago Press, 2001).
3. F. Etro, 'Stackelberg Competition with Endogenous Entry', *The Economic Journal* April (2008). For recent theoretical contributions see P. Bertoletti, E. Fumagalli & C. Poletti, 'On Price-Increasing Monopolistic Competition', Bocconi University (2008); A. Gautier, K. Dam & M. Mitra, 'Efficient Access Pricing and Endogenous Market Structures', *mimeo*, Universitè de Liege, Belgium (2008); and A. Tesoriere, 'Stackelberg Equilibrium with Many Leaders, U-shaped Average Costs, and Endogenous Number of Followers', *mimeo*, University of Palermo (2008).

predatory pricing just to induce the exit of the rival, but a firm facing endogenous entry of competitors would ordinarily engage in aggressive pricing strategies without exclusionary purposes. Consider another example: a monopolist in a primary market competing with a single rival in a secondary market may bundle its goods to monopolize the secondary market as well, but when the secondary market is characterized by endogenous entry the only purpose of bundling can be the strengthening of price competition.[4] Finally, a firm facing a single rival could adopt vertical restraints on its retailers, or price discrimination strategies to soften price competition, but when the same firm faces endogenous entry of rivals these anti-competitive practices will not be in its interest. Of course, it should be noted that efficiency reasons can still motivate the adoption of bundling, vertical restraints, price discrimination or other strategies, as the old Chicago school pointed out.

The bottom line of this discussion on competition in the market is that in evaluating market structures and the behaviour of market leaders we should be especially careful to consider the entry conditions. Standard results on aggressive price and non-price strategies with exclusionary purposes emerging for markets with an incumbent and an entrant can change in radical ways when we take in consideration the possibility of endogenous entry by other firms. After all, antitrust policy in an uncertain world should derive from a comparison of the expected losses from incorrectly challenging a practice that benefits consumers (a Type I error) versus the expected losses from incorrectly failing to challenge a practice that harms consumers (a Type II error).[5] We believe that while the Chicago school has been extremely biased to reduce the first kind of loss (because it largely ignored strategic interactions and imperfect competition), the post-Chicago approach has been excessively biased in the opposite sense (because it systematically neglected endogenous entry).

Related results emerge in case competition is not in the market but for the market, that is it takes place by investing in R&D to create new products (this is typical of the pharmaceutical sector and many high-tech sectors). Also in such a case market leaders tend to invest a lot and therefore to remain leaders when pressured by endogenous entry in this form of competition, and they tend to invest less when they are not under such a pressure: this implies that persistent dominance can be the fruit of high competitive forces rather than the fruit of market power and abuse of intellectual property rights (IPRs).[6] Of course, we do not want to give the message that persistent monopolies are necessarily the fruit of such an effective competition for the market, but rather that they can be the fruit of effective

4. F. Etro, 'Market Leaders, Antitrust Policy and the Software Market', *Icfai Journal of Industrial Economics* 5, no. 1 (2008): 7–30.
5. See G. Immordino & M. Polo, 'Judicial Errors and Innovative Activity', *mimeo*, Bocconi University (2008), for an interesting law and economics analysis on the point for innovative sectors.
6. F. Etro, 'Innovation by Leaders', *The Economic Journal* 114, no. 4 (2004): 495, 281–303. For recent empirical evidence see J. D. Adams & J. R. Clemmons, 'Invention and Discovery In Science-Based Firms', *mimeo*, University of Florida (2008); and D. Czarnitzki, F. Etro & K. Kraft, 'Who does Invest in Innovation? Theory and Evidence', *mimeo*, Intertic (2008).

competition. What we would like to emphasize is the importance of entry conditions in the market for innovations. This is in line with an old Chicago-style position associated with Demsetz, who pointed out that:

> [U]nder the pressure of competitive rivalry, and in the apparent absence of effective barriers to entry, it would seem that the concentration of an industry's output in a few firms could only derive from their superiority in producing and marketing products . . . an industry will become more concentrated under competitive conditions only if a differential advantage in expanding output develops in some firms . . . The cost advantage that gives rise to increased concentration may be reflected in scale economies or in downward shifts in positively sloped marginal cost curves, or it may be reflected in better products which satisfy demand at a lower cost.[7]

Consequently, industrial policy, including antitrust policy, should primarily promote, and possibly subsidize, investment in R&D, while it should be less relevant whether the incumbent monopolist or newcomers invest in R&D and innovate once entry is free. On the other side, the protection of IPRs should be established at a legislative level (possibly even coordinated at an international level) because its stability is essential to foster investments, while the discretionary activity of antitrust authorities should not affect the basic principles of IPR protection.

The endogenous entry approach shows a related outcome in relation to horizontal mergers. It is well known, even in the absence of cost efficiencies, that these mergers are often profitable when entry is exogenous because they allow the merged entity to increase prices or restrict production so as to enhance profitability. These effects are counterproductive when entry is endogenous because any accommodating strategy attracts entry. Therefore, the only rationale for mergers in EMSs must be a cost efficiency large enough to (more than) compensate the strategic disadvantages associated with the merger.[8] In these cases, mergers are welfare improving, a result which is complementary to that of the old Chicago school. Finally, a related result applies to price-fixing agreements. These are ineffective whenever entry in the market is endogenous, unless the cartels act as leaders. In this case, cartels coordinate aggressive strategies aimed at increasing the market shares of their members through low prices, and their implementation is always sustainable and does not harm consumers. Of course, when entry is not free or when all firms engage in the cartel, collusion increases the prices and hurts consumers.

It is clear that the relevance of the EMS approach for policy purposes depends on the reliability of the hypothesis that entry is endogenous. One may argue that entry can be regarded as endogenous in the medium and long run, but not necessarily in the short run. If this is the case, and if antitrust policy is aimed at correcting

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7. H. Demstez, 'Industry Structure, Market Rivalry, and Public Policy', *Journal of Law & Economics* 16, no. 1 (1973): 1–9.
8. For recent empirical evidence see X. Zhou, 'Estimation of the Impact of Mergers in the Banking Industry', *mimeo*, Yale University (2008).

distortions in the medium and long run (as opposed to short run distortions), then these results are potentially relevant for many dynamic markets.

III TOWARD A REFORM OF ANTITRUST POLICY FOR DYNAMIC MARKETS

In the last few years there has been a lot of academic and political debate on how to reform the EU approach to antitrust, and in particular on issues concerning abuse of dominance, moving toward an economic-based approach more similar to the US approach. The European Commission has proposed a new approach to exclusionary abuses under Article 82 that is the subject of an open debate and gives an important indication as to how the Commission may approach antitrust cases of abuse of dominance in the future.[9] We will comment on this debate focusing on the general principles of EU antitrust policy, but our discussion tries to provide principles for antitrust policy that could be applied to any national antitrust authority.

The EU approach appears to move toward a purpose of competition policy associated with the protection of competition in the market as a means of enhancing consumer welfare and of ensuring an efficient allocation of resources. This implies that antitrust should protect competition and not competitors, and be based on an economic analysis aimed at the maximization of consumer welfare and allocative efficiency rather than based on a legalistic analysis, a new direction which appears much more in line with the consolidated US approach. While the aim is to enhance consumer welfare and to protect competition and not competitors, we have some concern that these principles are not fully carried through into certain aspects of the current EU competition policy and of the proposal of the European Commission (2005). As a matter of fact, until now the approach of the European Commission has been often in line with outdated views, for instance when stressing an excessive reliance on market shares in determining dominance and ignoring the peculiarities of dynamic innovative sectors. The analysis of whether an undertaking has engaged in abusive conduct under Article 82 should ultimately turn on the conduct's actual effects on efficiency and consumer welfare. Thus, we believe that, if the pro-consumer benefits of a dominant undertaking's conduct are significant, it should be immune from liability even if it disadvantages certain competitors. Inventing better products or more efficient methods of distribution, reducing prices or offering better terms of trade, and more quickly adapting to changes in the market can disadvantage rivals and maybe even cause them to exit the market. Yet, these forms of conduct often also enhance efficiency and consumer welfare.

The focus on the effects for consumers is particularly important with respect to fast-moving markets such as the pharmaceutical sector or New Economy industries, which are often characterized by massive R&D investments, strong reliance on IPRs and other intangible assets, high sunk costs, and low marginal costs. As we

9. European Commission, DG Competition, *Discussion Paper on the Application of Article 82 of the Treaty to Exclusionary Abuses* (Brussels: Commission of the European Communities, 2005).

already noticed, under competition for the market, leading firms might enjoy high market shares yet be subject to massive competitive pressure to constantly create better products at lower prices due to threats from innovative competitors and potential entrants. Undertakings that hold a significant share of the market at any given point in time may see this share decrease rapidly and significantly following the development and supply of a new and more attractive product by an actual or potential competitor. Nevertheless, the current EU approach is still characterized by a close association between market shares and market dominance, without any reference to the kind of market that is under consideration. In this section I will focus on two main issues in the field of abuse of dominance for dynamic markets: predatory pricing and IPRs policy.

IV PREDATORY PRICING

Predatory pricing is defined by European Commission (2005) as:

> [T]he practice where a dominant company lowers its prices and thereby deliberately incurs losses or foregoes profits in the short run so as to eliminate or discipline one or more rivals or to prevent entry by one or more potential rivals thereby hindering the maintenance or the degree of competition still existing in the market or the growth of that competition.

The standard antitrust approach uses a number of cost benchmarks in order to assess whether 'predatory pricing' by a dominant undertaking has actually taken place, and in particular it sets a cut-off such that pricing below this cut-off gives rise to a rebuttable presumption that the pricing is predatory. This strategy is supported by the traditional idea that pricing below marginal cost should have an exclusionary purpose in standard markets, while pricing above marginal cost should not. It is highly questionable that the marginal cost should be the right theoretical cut-off below which predation can be presumed, and we do believe that a rule of reason should be applied also in this case, because different sectors and different cost and demand structures require different approaches to the definition of predatory pricing. Anyway, since it is quite difficult to measure the marginal cost, many antitrust scholars, notably Areeda and Turner, have proposed to substitute it with the average variable cost (AVC):

> [T]he incremental cost of making and selling the last unit cannot readily be inferred from conventional business accounts, which typically go no further than showing observed average variable cost. Consequently it may well be necessary to use the latter as an indicator of marginal cost.[10]

The Areeda-Turner rule has influenced antitrust policy worldwide, but one should always keep in mind that there are (demand and technological) conditions under

10. P. Areeda & D. Turner, 'Predatory Pricing and Related Practices under Section 2 of the Sherman Act', *Harvard Law Review* 88 (1975): 637–733.

which its premise, the marginal cost as a cut-off below which pricing is predatory, is not valid: for instance, this is exactly what happens in dynamic markets characterized by network effects. Moreover, as we have noticed before, one cannot judge the pricing behaviour of a market leader in a correct way without taking the entry conditions into account. When entry is endogenous, in the practical sense that entry is driven by profitable opportunities and it is rapid, no firm can manipulate the market at its will. As McGee noticed in his pioneering work on predatory pricing, a necessary condition for the success, and therefore the viability, of a predatory strategy is that entry must be exogenously blocked:

> [O]bstacles to entry are necessary conditions for success. Entry is the nemesis of monopoly. It is foolish to monopolize an area or market into which entry is quick and easy. Moreover, monopolization that produces a firm of greater than optimum size is in for trouble if entry can occur even over a longer period. In general, monopolization will not pay if there is no special qualification for entry, or no relatively long gestation period for the facilities that must be committed for successful entry.[11]

Only when further entry is not feasible (even when it could be profitable), can a leader hope to induce the exit of the current rivals and monopolize the market.

On the basis of the EMSs approach, we propose the following rule for predatory pricing based on two steps:

(a) The Antitrust Authority should evaluate whether the undertaking is effectively constrained by endogenous entry of competitors in his strategic choices: if entry is endogenous dismiss the case, otherwise proceed.
(b) The Antitrust Authority should evaluate the relation between price, average total cost (ATC) and AVC:
    (i) a price above ATC should be lawful without exceptions;
    (ii) a price below ATC but above AVC should be presumed lawful with the burden of proving the contrary on the Antitrust Authority, and on the basis of the consequences on consumers and allocative efficiency;
    (iii) a price below AVC should be presumed unlawful with the burden of proving the contrary on the undertaking, through an efficiency defence or proving that demand or technological conditions reduce the relevant cut-off below the AVC.

Notice that the first step we propose is different from the traditional one, which simply evaluates whether there is a dominant position in the relevant market. The traditional step is based on the idea that after excluding the rivals, a dominant firm can monopolize the market and recoup its initial losses with higher prices. But, this is impossible when entry in the competition in the market is endogenous (there is no way to recoup losses by increasing future prices if a price increase attracts entry), and it is extremely unlikely when entry in the competition for the market

11. J. McGee, 'Predatory Price Cutting: the Standard Oil (N.J.) Case', *Journal of Law and Economics* 1 (1958): 137–69.

is endogenous (there is a low probability to recoup losses by increasing future prices of goods that may be soon replaced by innovations of other firms). The traditional definition of dominance (associated with the market share and the related indexes of concentration) should not be the relevant element to establish the likelihood of recoupment, particularly in high-tech markets. We believe that the focus should not be on the market leader in the first step of an antitrust investigation for abuse of dominance, but on the followers and on the chances that these followers have to exploit profitable opportunities in the market.

Concerning the second step in the evaluation of predatory strategies, EU antitrust has also adopted a similar approach. However, the recent proposal by the European Commission (2005) has suggested to substitute the AVC with an average avoidable cost (AAC), the average of the costs that could have been avoided if the undertaking had not produced a discrete amount of extra output (this extra output is usually the amount allegedly subject to abusive conduct), a sort of average marginal (or incremental) cost of the extra output to serve the predatory sales. Unfortunately, the AAC can be quite higher than the right theoretical concept whenever it accounts for fixed costs. Moreover, the AAC can be much more difficult to measure than the AVC, since it is almost always impossible to precisely define which costs are sustained for a given output and isolate the extra output (supposedly the predatory output) from the total one. Finally, there are well-known conditions, as in the presence of network externalities and multi-sided markets, under which extremely aggressive pricing is a normal competitive strategy for a market leader. For instance, it is a standard practice for multi-sided markets to charge less to one side of the market (such as readers for a newspaper or end-users for video game consoles) and more to the other side (advertisers and game developers in these examples), without an exclusionary purpose but only to create network effects and increase the value of the interactions between the two sides. Often, the price on one side is not only below cost, but even below zero (the sale is subsidized with free adds, for example), and nevertheless even such a strategy is not necessarily predatory. For these reasons, we believe that the traditional AVC remains a better reference than the AAC.

V INTELLECTUAL PROPERTY RIGHTS POLICY

In this section, we want to look at the relationship between antitrust and the protection of IPRs. While we noticed that the latter should be the focus of legislation and not of the discretionary behaviour of antitrust authorities, the current EU approach deals with IPRs in the discipline on refusals to supply, that is, situations where a dominant company denies a buyer access to an input in order to exclude that buyer from participating in an economic activity. In general, four conditions have to be fulfilled in order to find a refusal to supply to be abusive: (i) the behaviour must be properly characterized as a termination of a previous supply arrangement; (ii) the refusing undertaking must be dominant; (iii) the refusal must be likely to have a negative effect on competition; and (iv) the refusal must not be

justified objectively or by efficiencies. Only when the dominant supplier has not previously supplied the input to a potential buyer, as for IPRs, an additional criterion is added: (v) the input must be 'indispensable' to carry on normal economic activity in the downstream market (a so-called 'essential facility').

Nevertheless, the European Commission (2005) correctly points out that:

> [T]o maintain incentives to invest and innovate, the dominant firm must not be unduly restricted in the exploitation of valuable results of the investment. For these reasons the dominant firm should normally be free to seek compensation for successful projects that is sufficient to maintain investment incentives, taking the risk of failed projects into account. To achieve such compensation, it may be necessary for the dominant firm to exclude others from access to the input for a certain period of time.[12]

The proposal clearly states the priority of IPR protection, saying that

> [I]mposing on the holder of the rights the obligation to grant to third parties a licence for the supply of products incorporating the IPR, even in return for a reasonable royalty, would lead to the holder being deprived of the substance of the exclusive right.

Therefore, another more restrictive criterion is added in the case of a refusal to license IPRs: the undertaking which requests the license should intend to produce new goods or services not offered by the owner of the IPRs and for which there is a potential consumer demand. This additional criterion is in line with established case law, but an exception to this criterion is introduced by the European Commission (2005). This states that a refusal to license IPR-protected technology which is indispensable for follow-on innovation may be abusive even if the license is not sought to directly incorporate the technology in clearly identifiable new goods and services, since the refusal to license an IPR-protected technology 'should not impair consumers' ability to benefit from innovation brought about by the dominant undertaking's competitors'. This exception is inconsistent with economic analysis. There are no clear economic arguments supporting the view that weakening IPRs could ever strengthen innovation in the long run, even when innovation is sequential. As a matter of fact, the opposite is true: the protection of IPRs for sequential innovations is more important to promote innovation and growth because it creates a multiplicative effect on the incentives to innovate and it fosters technological progress and growth.[13] This view finds empirical support in recent research, for instance by Czarnitzki, Etro, and Kraft, who provide an empirical investigation based on a unique dataset on the German manufacturing sector (Mannheim Innovation Panel, 2005) showing that IPRs protection is a main determinant of R&D spending, and that incumbent leaders invest more than other firms in R&D when they are pressured by a

12. Paragraph 240 of the Discussion Paper (DG Competition discussion paper on the application of Art. 82 of the Treaty to exclusionary abuses), <http://ec.europa.eu/competition/antitrust/art82/discpaper2005.pdf>.
13. See n. 6, above, (Etro, 2004).

strong threat of entry.[14] Moreover, this appears to be exactly the situation in the two cases we referred to, the sectors of the information and communication technology sector and the pharmaceutical sector.

Finally, concerning the refusal to supply information needed for interoperability, the proposal in European Commission (2005) states that leveraging market power from one market to another may be an abuse of a dominant position and it may not be appropriate to apply the same high standards for intervention even if such information may be considered a trade secret. The framework for assessing how such leveraging may occur or when trade secrets do not deserve the same high standards for protection has not been developed yet. Again, such a broad policy intervention could have chilling effects on the incentives to invest and innovate and could ultimately end up protecting inefficient competitors that may free-ride on the risks and investments of the dominant undertaking, therefore in contradiction with the objective of protecting competition on the merits. Nevertheless, in the *Microsoft* case the EU Commission has exactly taken this dangerous direction, asking Microsoft to disclose a wide amount of technologies.[15] At the beginning of 2007 (Statement of Objections of 1 March), the Commission has asked to make them available royalty free unless they have an innovative nature (meaning that they involve an inventive and novel step compared to the prior art). Afterward, it has started questioning the same innovative nature (and with it the license pricing) of most technologies that Microsoft was forced to disclose, technologies which are also covered by many patents approved by US and EU patent offices. This created an even stronger contradiction between patent law and antitrust policy in the EU, and also a substantial divergence between the US approach to IPRs and the EU approach, with the former much more careful in protecting IPRs and promoting R&D. Unfortunately, the Court of First Instance (CFI) ruling of 17 September 2007, has substantially approved the Commission approach, creating a dangerous precedent for the protection of innovation in Europe, not only in the New Economy

14. See n. 6 above (Czarnitzki, Etro and Kraft, 2008). The authors use data from the Mannheim Innovation Panel (MIP) from the year 2005. This innovation survey has been conducted by the Centre for European Economic Research (ZEW), Mannheim, and covers a representative sample of the German manufacturing sector as well as business related services. They focus on the manufacturing sector. The 2005 spell of the MIP included some unique questions allowing to model entry threats and to identify leaders/incumbents. The database has a cross-sectional structure, but the questionnaire collects information generally for the years 2002 to 2004. The quantitative variables, such as R&D investment, capital, employment, sales etc., are surveyed for a certain year. For instance, R&D investment is only collected for the year 2004. Other information that is used as controls is, however, collected for the two years 2003 and 2004, so that one can make use of lagged controls to avoid direct simultaneity bias in the regressions. Qualitative information, such as the competitive situation in a firm's main market, the firm's competitive position, etc., are collected through one question each referring to the time period 2002–2004. The authors use the qualitative information to construct variables on incumbency and entry threats during this period, and argue that the situation between 2002 and 2004 will have an impact on strategic investment behaviour in 2004.

15. See Y. Katsoulacos, 'Refusals to Supply IP: Are we closer to an optimal legal standard after Microsoft vs Commission?', *mimeo*, Athens University (2008), on the case.

but also in other sectors, such as the pharmaceutical sector, where the innovation process is at the source of competition and progress.

It is important to understand that in high-tech sectors, patents and trade secrets often cover fundamental inventions, and protecting those inventions amounts to promoting innovations that today are the main engine of growth. In some fields, however, there may be, at least apparently, a trade-off between trade secret protection and 'interoperability' between products; broadly speaking, this is the ability of heterogeneous information technology systems, components, and services to exchange and use information and data, especially in networks. The problems arise when interoperability is confused with 'interchangeability' or with a right to clone the innovations of the competitors. Any forced disclosure of similar trade secrets represents an expropriation of legitimate investments and establishes inappropriate legal standards with perverse effects on the incentives to innovate.

Fortunately, giving up the precious role of IPRs in promoting innovations is not the only way to solve interoperability challenges. The market can do it much better: valuable ideas can be selectively commercialized on a voluntary basis through licenses, for instance under RAND (reasonable and non-discriminatory) terms, a type of licensing typically used during standardization processes to promote the rapid adoption of standards and new technologies and to encourage entry. The RAND terms include a definition of reasonable royalties, and can include further restrictions as field-of-use clauses (which allow licensees to utilize a patented technology in a use that is directly related to the implementation of the standard), reciprocity clauses, or limits to sublicensing. The Nobel prize winner Ronald Coase has clarified that whenever there is social value to generate, the market will properly allocate all the property rights.[16] This is also true for IPRs: the market mechanism can allocate them efficiently, insure the accessibility of the information that fuels interoperability, and acknowledge legitimate ownership rights of the innovators, so as to enhance R&D investments. In conclusion, also in this field, markets can properly balance the short run and long run interests of consumers better than policymakers: promote innovation, enable an efficient degree of interoperability and select the best standards. It would have been better to leave the ruling of IPRs and of its limits to the legislative level rather than creating an important precedent for which antitrust authorities could force firms to reveal their IPRs, as recently happened in the *Microsoft* case. The consequence for the incentives to innovate in high-tech sectors could be heavily negative.

VI AN APPLICATION: THE DYNAMIC MARKET FOR ONLINE ADVERTISING

An interesting case study concerning a dynamic market where antitrust issues play a crucial role is the market for online advertising, and in this section we will try to

16. R. Coase, 'The Problem of Social Cost', *Journal of Law and Economics* 3 (1960): 1–44.

examine it in light of our previous theoretical considerations. The battle for this market between Google, Yahoo!, and Microsoft, respectively number one, two and three, is at a crucial point. Important mergers and alliances are reshaping its market structure, but the consequences for consumers and the economy are uncertain. After the recent acquisition by Google of DoubleClick has strengthened the dominance of Google, Microsoft is trying to buy Yahoo! to create a viable competitor. At the time of writing (April 2008) Yahoo!'s board of directors is exploring strategic alternatives to maximize stockholder value, including exploration of potential commercial deals with Google, as witnessed by the announcement that it will begin a limited test of Google's product for search service, which will deliver relevant Google advertisements alongside Yahoo!'s own search results. Apart from what will be the ultimate outcome of this battle, it is interesting to examine in further depth because many mechanisms typical of dynamic markets and of related antitrust issues emerge here.

It is calculated that worldwide spending on advertising is currently above USD 600 billion, of which at least USD 40 billion is spent in the online field, less than 10%. Since 1994, when HotWire sold the first banner for advertising, and 1995, when Infoseek introduced search-based advertising, online advertisements have been constantly growing in all of their different forms (search advertising associated with search engines, display advertising, classified listings on web sites and email advertising). The market is destined to increase its share in the advertising market for the following reasons: (a) the Internet is rapidly growing and the large majority of websites generate revenues from advertising (with the notable exception of transaction websites such as eBay); (b) other devices such as mobile phones and televisions will be always more often connected to the Internet; (c) software innovation allows more efficient mechanisms to reach targeted consumers on the basis of the characteristics of search (keyword bidding system) and of the websites (contextual advertising) today, on the basis of the characteristics of the Internet users in the near future.

To analyse the strategies of the main companies of this market, let us first review the conditions under which an agreement or a merger involving a market leader and another firm hurt consumers according to the EMS approach, which considers both strategic effects and entry effects. A pre-condition for abusiveness is that the deal relaxes competition between two firms and leads them to increase prices. Two further requirements are needed. First, the merger doesn't create efficiency gains. Second, it doesn't attract endogenous entry of new firms. Of course, the extent to which a merger leads to price increases depends on multiple factors. First, high substitutability between the products of the merging firms brings higher incentives to increase post-merger prices (after all, firms producing unrelated goods would have no reason to increase their prices). Second, when price-cost margins are high, it is more profitable to increase prices. Third, when the firms operate in a multi-sided market (such as a software platform that charges both publishers and advertisers), a price change can optimize network effects between sides leading to higher profitability.

A merger between Microsoft and Yahoo! would create synergies in R&D efforts without consequences on the prices of the main products of Microsoft

(its operating system and Office) and Yahoo! (Internet services), which are complements and not substitutes, and it would allow these companies to join their forces and develop search engine capabilities and online advertising services able to represent a competitive alternative to Google, whose dominance in pay-per-click Internet advertising is now combined with DoubleClick's dominance in ad serving services.

On the contrary, a Google/Yahoo! combination would radically reduce competition. The implementation of an agreement that would ultimately lead to combining the paid search operations of Yahoo! and Google would eliminate meaningful competition to Google in the areas it dominates, while generating no significant efficiencies. As a matter of fact, any combination would violate the antitrust laws. Both a merger or the implementation of an 'outsourcing agreement', which would be a 'naked' agreement to pay off Yahoo! to quit the ad platform business in favour of its dominant rival. An outsourcing deal would sideline Yahoo! as a competitor and allocate approximately 90% of search to Google, ending prospects for competition. Even more significantly from the perspective of antitrust regulators, locking Yahoo!'s search query share and online traffic into Google's ad platform would ensure that no one could reach the scale necessary to mount a credible competitive alternative to Google. In contrast, a Microsoft-Yahoo! deal would enhance choice for content creators, advertisers, and consumers, creating a viable competitor to Google in both search and non-search advertising.

Let us look at the dominant firm of the market, Google. As well known, Google is the leading search engine in the world, with 53% of search traffic in the US at the beginning of 2008, against 17% for Yahoo!, 7% for Microsoft's Live, 6% for AOL and 3% for Ask, but with even higher market shares in other parts of the world (with the exception of Japan, where Yahoo! is the leader, and China, where Baidu is the leader). Notice that Yahoo! has been the leader in the US until 2002. Unitil 2000 it was followed by Altavista, in 2001 by Microsoft, and in 2002 by Google, which subsequently obtained the lead. Notice that competition for the market is crucial since access to search engines is free and simple (even if most PCs come with a search toolbar preinstalled, in most of the cases Google, has programmed a toolbar that is difficult for users to substitute), and most users employ the search engine that is regarded as the most valuable. Of course, network effects are crucial here and, in the absence of substantial product differentiation, lead to a single dominant player. Today, Google reached this position. Beyond this, Google dominates the lucrative business of placing text advertisements next to search engine result. Google AdWords (launched in 2000) accounts for about 70% of search advertising revenue worldwide. DoubleClick leads the industry in directly placing banner advertisements on third-party publishers, accounting for more than 75% of the direct (or reserved) channel, that is the valuable ad inventory that large web publishers directly negotiate with the advertisers (through their direct sales forces). Of course, a lot of the advertising space available on large websites and all of the space available on medium size and small websites cannot be sold in direct negotiations. Therefore, most of online advertising is typically sold through

indirect intermediaries that buy the so-called 'remnant' ad inventory from publishers and sell it to advertisers. This can be seen as a separate market from the market for the direct channel.

Google and DoubleClick play a major role in the market for intermediation services for remnant ad inventory. Google provides a vertically integrated intermediation platform between online web publishers and advertisers: Google's AdSense reaches more than 80% of the ad revenue in the indirect channel with integrated ad networks. The Google platform targets advertising to the relevant websites (so-called 'contextual advertising') and pays the web publishers with a percentage of its revenues. Meanwhile advertisers buy inventories from the platform through Vickrey auctions on the keywords that match the content of the webpages and lead Internet users to click on their advertisement: charges are typically for each click on the ad (CPC, cost per click), and the highest bid for each keyword association wins, but the price is given by the second highest bid. DoubleClick offers an ad serving and ad management product, DART, for publishers (DFP) and advertisers (DFA). Such a publisher tool manages the inventory of a website, receives the advertisements from ad networks and delivers them in the relevant inventory (according to the behavioural history of Internet users), usually at a fixed cost per thousand impressions (so-called CPM) which is a small percentage of the price that the web publisher charges the advertisers. The market share of ad revenue served by DoubleClick's DFP in the indirect channel with non-integrated ad networks is around 75%. Since almost 60% of online advertising taking place through the indirect channel adopts integrated intermediation, before the merger Google was controlling about half of the market and DoubleClick about a third of it. After the merger, they control at least 80% of the worldwide market for online advertising.

The two intermediation services offered by Google and DoubleClick are highly substitutable and, as a matter of fact, many web publishers use both for different inventories in their websites and in different moments. Needless to say, for these publishers the two services are interchangeable: they can easily recode some space on the website served by one channel to be served by the other channel. Adoption of the publisher tool provided by DoubleClick, or switching to a different one, involves high sunk costs in terms of substantial investments in software, training the staff, coding all of the publisher's web pages, creating novel datasets, transferring ad campaigns to the system, and so on, with all the associated business risk. For the same reason, multi-homing (with multiple, non-integrated ad networks) is highly inefficient in this case. Notice that the high switching costs, together with the difficulty of building alternative high quality intermediation services, represent a substantial barrier to entry of new firms in the short and medium run, which is the relevant time frame in such a rapidly evolving market. Finally, notice that this merger could create efficiencies in R&D spending, but could not create efficiencies reducing marginal costs of production for the simple reason that marginal costs in the software market are already close to zero. Consequently, any increase in mark-ups after the merger would lead to an increase in prices.

The bottom line of this story is quite simple. Before the merger, competitive forces kept online advertising prices under control: DoubleClick could not increase

prices because many consumers would have quickly switched toward AdSense, and Google could not increase prices because many customers would have switched immediately to DoubleClick's products. After the merger, these competitive constraints are destined to disappear: Google is about to increase the price of DFP services being sure that most of the lost customers would simply switch to AdSense (the direct channel would be unavailable and more expensive, and other publisher tools would be penalized by the high switching costs). Given the high margins and the network effects that Google could enjoy by increasing its market share, the profitability of the price increase would be further enhanced.

Needless to say, an alliance between the number one of online advertising, Google, and the number two, Yahoo!, would increase exponentially these problems, leading to absolute dominance by a single company. At this point, the outcome of the attempt of Microsoft to buy Yahoo! is crucial for the destiny of the market for online advertising: the merger could create the conditions to compete effectively with the dominant force of Google in online advertising. Such a merger would create the strong competitive pressure on Google in the competition for the market (and in the market as well) that is necessary to increase efficiency and innovativeness in the whole sector.

VII CONCLUSIONS

In this article we reviewed some recent results of the theory of EMSs and its applications to antitrust issues for dynamic innovative sectors, with particular reference to abuse of dominance and mergers. In conclusion, we simply remember the main suggestion coming from this line of research. Whether competition is in the market or for the market, whether the issue under consideration concerns predatory pricing, other abuses of dominance, or mergers, a crucial aspect to be evaluated is given by the entry conditions. When entry is endogenous, it typically leads to pro-competitive behaviour of the incumbent firms in terms of pricing strategies, innovative efforts, or merger tendencies. When entry can be regarded as exogenous in the short or medium run, then the behaviour of the market leaders can be (not necessarily, of course) abusive, and the strategic consequences of their actions must be evaluated case by case.

Dynamic innovative markets are often characterized by a strong competitive and innovative pressure of the entrants that brings their leaders to adopt aggressive pricing strategies and high investments in R&D whose consequences are large market shares and persistent leaderships. Antitrust authorities should be careful to distinguish these pro-competitive results from the abusive behaviour emerging in the absence of those entry forces.