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The Endogenous Entry Approach to Antitrust



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Introduction

Recent research in industrial organisation has proposed a new approach to antitrust issues that is based on the analysis of endogenous market structures. 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 by technological constraints and demand conditions: 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, decision to merge, and price fixing agreements can be studied under a different light. The important aspect for antitrust issues is that the endogenous entry approach has reached conclusions that are in the same spirit as the Chicago approach, 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.

In this work I will review this recent literature and propose a critical view of the post-Chicago approach to antitrust policy, emphasising that the latter has often disregarded the consequences of the endogeneity of market structures. The main implications concern the behaviour of market leaders and, consequently, the antitrust approach to abuse of dominance (or monopolisation), but I will also derive implications for the antitrust approach to mergers and collusion.

Let us start with the implications for abuse of dominance issues, which require an understanding of the behaviour of leaders in different market conditions. The endogenous entry approach has shown that whether entry in a market is exogenous or endogenous greatly influences the way leaders behave.¹ 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, market leaders always adopt aggressive strategies which typically do not harm consumers, precisely because this is the optimal way to react to (endogenous) entry.

For instance, a firm competing with a single rival could engage in accommodating pricing to increase mark-ups, or could engage in predatory pricing just to induce the exit of the rival, but a firm facing endogenous entry of competitors will 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 monopolise the secondary market as well, but when the secondary market is characterised by endogenous entry the only purpose of bundling can be the strengthening of price competition. 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

¹ For a comprehensive review of the theoretical literature see Etro, Federico; *Competition, Innovation, and Antitrust*; Springer-Verlag; New York and Berlin; 2007.

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 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 counter-productive when entry is endogenous because any accommodating strategy attracts entry. Therefore, the only rationale for mergers in endogenous market structures must be a cost efficiency large enough to (more than) compensate the strategic disadvantages associated with the merger. 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 endogenous entry 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 distortions in the medium and long run (as opposed to short run distortions), then these results are potentially relevant for many markets. The rest of this essay discusses them in further detail.

Chicago and post-Chicago schools

The so-called pre-Chicago approach to antitrust was mostly based on the simplistic insights of the early studies on imperfect competition, which associated monopolistic behaviour and abusive conduct with firms having large market shares. Such a naïve view has been challenged since the 1950s and 1960s by what we now call the 'Chicago school', led by Aaron Director and other exponents of the Law School of the University of Chicago, whose main merit has been to introduce a systematic economic approach to antitrust. While the Chicago school seriously attacked collusive agreements as conducive to large welfare losses, it was less critical of mergers and exclusionary practices. Many scholars were (and still are) convinced that, when there are potential entrants in a given sector, mergers are mostly aimed at creating beneficial cost efficiencies, while aggressive strategies such as bundling, price discrimination and exclusive dealing, are not necessarily anti-competitive but may instead have a strong efficiency rationale behind them. For instance, bundling is typically used for price discrimination purposes and not for exclusionary purposes. Moreover, according to a widespread view in the Chicago school, there is no such a thing as predatory pricing, which is reducing prices below costs to induce exit by competitors and compensating the initial losses with future monopolistic profits. The main reason is that, if the predator can sustain such initial losses, also any other prey can sustain the induced losses (which are smaller since its output is lower) for as long as credit markets are working properly, suggesting therefore that predatory pricing would not be effective.²

² McGee, John; Predatory Price Cutting: the Standard Oil (N.J.) Case; *Journal of Law and Economics*; 1; 1958; pp 137-169.

More recently, Posner has taken a less extreme position, claiming that "there is an economic basis for concern with at least some exclusionary practices, in at least some circumstances; and a few practices that are not exclusionary (though so classified in the law), like persistent price discrimination, may still be undesirable on strictly economic grounds".³ Accordingly, Posner proposes a moderate standard for judging practices claimed to be exclusionary: "in every case in which such a practice is alleged, the plaintiff must prove first that the defendant has monopoly power and second that the challenged practice is likely in the circumstances to exclude from the defendant's market an equally or more efficient competitor. The defendant can rebut by proving that although it is a monopolist and the challenged practice exclusionary, the practice is, on balance, efficient".⁴ This efficiency defence is at the basis of the rule of reason approach, for which a business practice is not *per se* illegal, but can be justified if it does not harm consumers or create efficiencies.

The Chicago school provided fundamental insights into many antitrust issues, but it limited most of its analysis to the understanding of monopolistic and perfectly competitive markets, and in a few cases it focused on markets characterised by a monopolist facing a competitive fringe of potential entrants. Dismissing the useful progress in the applications of game theory (the modern mathematical tool of economists dealing with strategies), the Chicago school ignored the important role of the strategic interactions between incumbents and entrants. The consequence was that its approach to exclusionary practices has been often biased toward a competitive role of the incumbents without an updated theoretical supporting argument.

In the 1980s, while the Chicago school succeeded in reducing the enforcement attitudes of US antitrust law, especially under the Reagan administration, the so called post-Chicago approach started to expand its influence among economists and, in the following decade, also among antitrust scholars. This approach introduced new tools based on game theory in order to study complex market structures and derive sound normative implications. With reference to exclusionary practices, the post-Chicago approach has shown that in the presence of strategic commitments to undertake preliminary investments, of asymmetric information between firms, of credit market imperfections or in the presence of limited forms of irrationality, predatory pricing or bundling can be equilibrium strategies for the incumbent, can deter entry and can harm consumers. Similarly, it has shown that mergers can facilitate accommodating strategies and hurt consumers, and it has studied in detail the conditions needed to sustain collusion through price fixing agreements.

One should keep in mind that many of the results of the post-Chicago approach concerning exclusionary strategies (summarised in the early but still unsurpassed work of Tirole) are somewhat weak, and they largely depend on a number of restrictive assumptions.⁵ For example, predatory pricing has been shown to be exclusionary under extreme circumstances, including forms of irrational behaviour (in reputation models) or pervasive market imperfections, and, even when exclusion emerges under more plausible conditions, it is not necessarily associated with pricing below cost or even with reductions in consumer welfare (in signalling models), which is what should matter in drawing antitrust implications. Nevertheless, the intellectual achievements of the post-Chicago approach,

³ Posner, Richard; *Antitrust Law*; University of Chicago Press; Chicago; 2001; p4.

⁴ *Ibid*; pp. 194-5.

⁵ Tirole, Jean.; *The Theory of Industrial Organization*; The MIT Press; Cambridge; 1988.

especially the introduction of game theory as the ultimate tool of industrial organisation and the proof of the possibility of profitable exclusionary strategies, are remarkable.

My critique of the post-Chicago approach is not centred on its foundation in game theory or on its specific results, but on the general applicability of these results for policy purposes. In most cases, the modern game theoretic literature in industrial organisation has studied the behaviour of incumbent monopolists facing a single potential entrant. To cite the most known theoretical works with strong relevance for antitrust issues, this was the case of the Dixit model of entry deterrence, of the models by Kreps-Wilson and Milgrom-Roberts of predatory pricing, by Fudenberg-Tirole and by Bulow-Genakoplos-Klemperer on strategic investment, by Bonanno-Vickers on vertical restraints, by Whinston on bundling for entry deterrence purposes, and many other subsequent works based on analysis of duopolies with an incumbent and an entrant. Also most of the standard results on the behaviour of incumbents in terms of pricing, R&D investments, mergers, quality choices and vertical and horizontal differentiation are derived in duopolistic models, where the incumbent chooses its own strategies in competition with a single entrant. While this analysis simplifies the interaction between incumbents and competitors, it can be highly misleading, since it assumes away the possibility of endogenous entry, and hence limits its relevance to situations where the incumbent already has an exogenous amount of market power. It is not surprising that the results of the post-Chicago approach have been often biased toward an anti-competitive role of the incumbents.

The fallacy of this line of thought, in my view, derives from a simple fact: it is based on a partial theory of oligopoly limited to the analysis of duopolies which does not take into account that, at least in most cases, entry by competitors is not an exogenous fact, but an endogenous choice. Whether entry is more or less costly, it is typically the fruit of an endogenous decision by the potential competitors. Of course, entry can be regarded as an exogenous phenomenon in the case of a natural monopoly or when there are legal barriers to entry, but these cases should not be a subject of antitrust analysis, but of regulatory analysis. When entry can be regarded as an endogenous element which depends on the technological conditions that constraint the profitability of the firms, we need a complete understanding of endogenous market structures to examine the behaviour of leaders, and the effects of mergers and cartels within these markets.

The role of endogenous entry

The endogenous entry approach clarifies the role of market leaders and of the entry conditions in a game-theoretic framework that is more general than most analysis within the post-Chicago approach. In this section I will review its results and compare its implications for antitrust with those of the traditional approaches, but before doing that, I need to clarify a few concepts concerning the determinants of entry in a market.

Industrial organisation literature has emphasised different kinds of constraints on entry. The definition of barriers to entry has been thoroughly debated. Bain associated them with the situation in which established firms can elevate their selling prices above minimal average costs of production without inducing entry in the long run. Broadly speaking, such a situation corresponds to what we defined as competition between an exogenous number of firms: even if profits can be obtained in the market, entry is not possible. Stigler has proposed a different definition of barriers to entry, associating them with costs of production which must be borne by firms seeking to enter an industry but not borne by the incumbents; a similar approach has prevailed more recently, so that we can talk of

barriers to entry as sunk costs of entry for the competitors which are above the corresponding costs of the incumbent (or already have been paid by the incumbent). According to this definition, sunk costs can be binding on the entry decision of the followers, therefore, they can be a crucial determinant of the endogeneity of entry in a market. A final category is that of the fixed costs of entry: these are equally faced by the incumbent and the followers to produce in the market, but they can also represent a binding constraint on entry. While there is a fundamental difference in the concepts of sunk costs and fixed costs of entry, their role in endogenising entry is virtually the same, and we will not stress the difference in what follows.

Another important aspect is the source of these barriers and costs. As we noticed before, they can constitute a source of antitrust examination if they have been artificially created or enlarged by the incumbent; they cannot if their source is purely technological. Nevertheless, it is hard to imagine how artificial barriers could be erected under normal circumstances. The Chicago school is quite clear on this point, as we can conclude from Bork: "If everything that makes entry more difficult is viewed as a barrier, and if barriers are bad, then efficiency is evil. That conclusion is inconsistent with consumer-oriented policy. What must be proved to exist, therefore, is a class of barriers that do not reflect superior efficiency and can be erected by firms to inhibit rivals. I think it clear that no such class of artificial barriers exists."⁶

The main point emerging from our analysis of the behaviour of market leaders facing or not facing endogenous entry is that standard measures of the concentration of a market have no relation to the market power of the leaders of a market, and may lead to misleading welfare comparisons. In what follows, I will review the main applications for markets in which firms compete by choosing how much to produce (so called competition in quantities), markets where firms simply choose their prices (competition in prices), and for markets where firms undertake strategic commitments of different kinds before competing.

Competition in quantities

The irrelevance of market shares for the evaluation of the market power of leaders emerges quite clearly in the simplest environment, that of competition in quantities with homogenous goods, constant marginal costs and a fixed cost of production. Such a simple structure approximates the situation of many sectors where product differentiation is not very important but there are high costs to starting production or R&D costs (as in the market for operating systems or in many other high-tech sectors). In such markets the characterisation of the equilibrium structure is drastically different when entry conditions change. First of all, as long as the number of firms is exogenously given and the fixed costs of production are not too high, the leader is aggressive but leaves space for the followers to be active in the market. As external observers, we would look at this as a market characterised by an incumbent with a market share typically larger than its rivals, but with a certain number of competitors whose supply of goods reduces the equilibrium market price. The higher the number of these competitors, the lower the price will be: in such a case, lower concentration would be correctly associated with higher welfare.

Radical changes occur when entry in the market is endogenous, and is determined by the existence of profitable opportunities in the same market.⁷ In such a case the leader would expand production until no one of the potential

⁶ Bork, Robert; *The Antitrust Paradox. A Policy at War with Itself*; The Free Press; New York; 1993.

⁷ Etro, Federico; Stackelberg Competition with Endogenous Entry; *The Economic Journal*; 2008 (forthcoming).

entrants has incentives to supply its goods in the market. The intuition for this extremely aggressive behaviour of the market leader is simple. When entry is endogenous, the leader understands that a low production creates a large space for entry in the market while a high production reduces entry opportunities. More precisely, knowing how technological constraints govern the incentives to enter in the industry, the leader is aware that its output exactly crowds out the output of the competitors leaving unchanged the aggregate supply and hence the equilibrium price. However, taking this equilibrium price for the market as given, the leader can increase its profits by increasing its output and reducing the average costs of production. Here the fixed costs of production (associated with constant marginal costs) are crucial: on one side they constrain the profitability of entry, while on the other side they create scale economies in the production process that can be exploited by the leader through an expansion of its output. Actually, it is always optimal for the leader to produce enough to crowd out all output by the competitors: exploiting the economies of scale over the entire market allows the leader to enjoy positive profits even if no entrant could obtain positive profits in this market. As external observers, in this case, we would simply see a single firm obtaining positive profits in a market where no one else enters, and, following traditional paradigms, we would associate this situation with a monopolistic environment, or at least with a dominant position derived by some barriers to entry. But this association is not correct, since entry is indeed free in this market: it is the competitive pressure of the potential entrants that induces the leader to produce so much to drive down the equilibrium price until no other firm can enter.⁸ Finally, this equilibrium with only the leader in the market is associated with a higher welfare than the free entry equilibrium without a leadership - which would involve many firms active in the market earning zero profits, and would imply large duplication of fixed costs.

Let us consider now a related situation with a different cost pattern for the firms. When marginal costs are increasing at the production level (at least beyond a certain production level) or, more generally, when the average costs have a U-shape, a market leader facing endogenous entry of competitors may not have incentives to deter entry, but would still behave in an aggressive way. In such a case, given the strategy of the leader, all the entrants maximise their own profits and therefore they price above the marginal cost. However, endogenous entry reduces the equilibrium price at a level that is just high enough to cover the fixed costs of production.⁹ Also in this case, the leader takes into account these elements and, in particular, takes as given the equilibrium price emerging from the endogenous entry of the competitors. Accordingly, the leader finds it optimal to produce enough to equate its marginal cost to the price.¹⁰ Since marginal costs are increasing for such a high production level, the leader is pricing above its average cost, and therefore obtains positive profits. In this case the strategy of the leader does not even affect the market price, which is fully determined by endogenous entry of firms. Nevertheless, the leader obtains a larger market share than its rivals as well as positive profits. Moreover, I have shown that the aggressive behaviour of the leader, who adopts a price equal to the marginal cost, improves the allocation of resources compared to the same market with free entry and no leadership.¹¹ A similar situation emerges when goods are not homogeneous but they are differentiated.

⁸ Notice that we are talking of firms that are as efficient as the leader (since we assumed identical cost technologies).

⁹ Notice that this equilibrium generates a production below the efficient scale (which should equate marginal and average costs).

¹⁰ This requires a production above the efficient scale.

¹¹ Etro (2008); *op. cit.*

The crucial lesson from this analysis is that we should be careful in drawing any conclusion from indexes of concentration or from market shares: large market shares of the leader can be associated with competitive behaviours induced by competitive entry pressure.¹²

Competition in prices

Another important implication of the endogenous entry approach emerges under competition in prices. In this typical situation, the traditional analysis shows that dominant firms are either accommodating (setting high prices) or trying to exclude rivals by setting low enough prices: the first case happens when the fixed costs of entry are small (and predation would be too costly), the second when they are high enough. Such an outcome implies the risk of erroneously associating an aggressive price strategy with an entry deterring strategy in a systematic fashion. When we endogenise entry in the market, leaders never adopt accommodating pricing strategies while they are always aggressive. Again, in equilibrium with endogenous entry, leaders increase their market shares and obtain positive profits. Of course an aggressive pricing strategy will still reduce entry, even if it will not exclude all rivals. Nevertheless, we must be more careful in associating aggressive pricing with predatory purposes. The reason why predatory strategies are anti-competitive is that they exclude competition in the future allowing the dominant firm to behave in a monopolistic fashion once competitors are out of the market. Clearly, if an aggressive pricing strategy is aimed at excluding some but not all competitors, this anti-competitive element is more limited.

Strategic commitments, bundling, vertical restraints and abuse of dominance

In general, the spirit of our result on the aggressive behaviour of leaders applies when leaders cannot commit to output or price strategies, but can undertake preliminary investments that change their incentives in the market. For instance, a market leader facing an exogenous number of competitors may want to underinvest or overinvest strategically in cost reducing R&D according to the kind of competition (in prices or in quantities), because it may want to commit through these investments to adopt an accommodating or an aggressive strategy in the market: in particular, underinvesting is optimal before price competition, while overinvesting is optimal before quantity competition. However, this ambiguity collapses if the leader is facing endogenous entry of competitors. In such a case, it is always optimal to adopt the strategy that allows one to be aggressive in the market: strategic overinvestment in cost reducing R&D is optimal when independent from the form of competition, because it allows one to be aggressive against competitors.

Both effective and potential competition is crucial here. On this point, we are close to the early informal insights of the Chicago school. For instance, Posner notices that “notions of potential competition cannot and should not be banished entirely from antitrust law... a monopolist who creates excess capacity in order to reduce his marginal cost, so that entrants (who have to be able to cover their average total cost if they are to make a go of entry) are deterred, is reacting to potential competition.”¹³

¹² Of course, an abusive behaviour can be still associated with aggressive strategies aimed at foreclosure and with negative consequences on consumers. This can be the case under two circumstances: 1) when these strategies are implemented by leaders with genuine market power which is not constrained by effective entry, and 2) when the same leader has built barriers to artificially constrain entry and without efficiency reasons.

¹³ Posner; *op. cit.*; p 145

An interesting situation for antitrust purposes emerges when demand is characterised by *network effects*. In such a case, market leaders tend to underprice their products initially to attract customers in the future. As known, these strategies may induce pricing below marginal cost without entry deterrence purposes. Moreover, leaders facing endogenous entry may have further strategic incentives to reduce initial prices (or expand initial production): by doing so, they enhance network externalities and are able to reduce their prices also in the future. Therefore, antitrust authorities should be careful in evaluating aggressive pricing in the presence of network effects. Finally, this point applies in particular to multi-sided markets, where network effects take place between different kinds of customers, and firms can charge their different customers differently. In such an environment market leaders tend to price quite one of the sides aggressively, but again without exclusionary purposes.

The same care in judging aggressive strategies is needed in cases of complementary strategies that virtually induce aggressive behaviour. One of these is *bundling*. In an influential article, Whinston has studied bundling in a market with two goods. The primary good is monopolised by one firm, which competes with a single rival in the market for the secondary good. Under price competition in the secondary market, the monopolist becomes more aggressive in its price choice in case of bundling of its two goods. Since a more aggressive strategy leads to lower prices for both firms as long as both are producing, the only reason why the monopolist may want to bundle its two goods is to deter entry of the rival in the secondary market. This conclusion can be highly misleading because it neglects the possibility of further entry in the market. If the secondary market is characterised by endogenous entry, the monopolist would always like to be aggressive in this market and bundling may be the right way to commit to an aggressive strategy. Bundling would not necessarily deter entry in this case, especially if there is a high degree of product differentiation in the secondary market, but may increase competition in this market and reduce prices with positive effects on the consumers.

With Windows Media Player, an application to download and play audio and video, a clear example of this situation is given by the bundling strategy of Microsoft, which has bundled its main product, the operating system Windows. The European Commission has punished Microsoft for abuse of dominance, and the Court of First Instance has recently confirmed that decision. Nevertheless, the picture emerging from the software market is quite different: in the last few years many different media players have appeared, most of them have been freely distributed, and most consumers have used and keep using more than one, typically for different purposes. Moreover, the dominant media player is not Windows Media Player by Microsoft, but Flash by Adobe, which is employed, for instance, to view YouTube videos. In this scenario, it appears that the bundling strategy of the leading firm has strengthened competition and reduced prices rather than the opposite.¹⁴ In light of these results, we believe that similar interferences of the antitrust authorities on the improvements of innovative firms may limit competition and jeopardise innovation.

Finally, another application of the endogenous entry approach concerns *vertical restraints* affecting inter-brand competition. Also in this case, the behaviour of the market leader can be anticompetitive depending on the entry conditions. In particular, under price competition, a contract delegating distribution to a downstream firm tends to soften price competition when entry in the market is exogenous (because the upstream firm imposes high prices through direct or indirect contractual restraints), but it strengthens price competition when entry is endogenous (in

¹⁴ Moreover, demand for the unbundled version of Windows has been virtually zero, a clear sign that consumers were not damaged by the bundling of Windows with Windows Media Player.

which case the upstream firm can only gain by inducing an aggressive behaviour of the downstream firm): the consequences on consumers tend to be negative in the former case and positive in the latter case.

Predatory pricing

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 approach 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.

The endogenous entry approach emphasises some limits of this way of thinking: pricing at or below marginal cost by the market leader does not need to exclude (equally efficient) competitors and it does not even need to induce short run losses for the same leader. To see why, let us remember that a leader in a standard market with quantity competition and endogenous entry can generally choose between two alternative strategies. The first one is to price below the rivals and allow their entry with a price equal to their average cost but above the marginal cost. The second strategy is to choose a limit price such that entry is not profitable for any firm. The former strategy is optimal when marginal costs are increasing enough in the production level and/or products are differentiated, while the latter strategy is optimal in the case of decreasing or constant marginal costs and/or homogenous goods.

Let us focus on the first situation. When goods are homogenous, the equilibrium strategy of the leader is simply to price at marginal cost, and its profits are positive because production is in the region where average total costs are increasing. When goods are differentiated, the equilibrium price of the leader is above its marginal cost, and profits are again positive. As we have seen, in this equilibrium entry occurs, and is not deterred. Moreover, if the leader can obtain positive profits in equilibrium by pricing at marginal cost, positive profits could be preserved even by pricing slightly below marginal cost as long as the scale of production is large enough.

Let us focus on the second situation now. The leader can deter entry when marginal costs are constant or decreasing and/or goods are homogenous, and this happens with a price of the leader above the marginal cost. Nevertheless, when entry is endogenous this is a normal competitive strategy of a firm able to exploit scale economies and reduce average costs of production.

Finally, we saw that in dynamic (and multi-sided) markets where demand is characterised by network externalities, leaders may want to price below the marginal cost without an entry deterrence purpose. The actual purpose would be to develop network effects or decrease costs for the future and to be more aggressive in future competition: pricing low today to price low tomorrow as well! In conclusion, it is 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 also be applied in this case, because different sectors and different cost and demand structures require different approaches to the definition of predatory pricing.

On the basis of our theoretical discussion, we can now try to draw our conclusions on the proper approach to predatory pricing. As we have noticed, one can not 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: "Obstacles to entry are necessary conditions for success. Entry is the nemesis of monopoly. It is foolish to monopolise an area or market into which entry is quick and easy. Moreover, monopolisation that produces a firm of greater than optimum size is in for trouble if entry can occur even over a longer period. In general, monopolisation 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."¹⁵

Only when entry is not feasible (even when it could be profitable), a leader can hope to exclude the current rivals and monopolise the market. On the basis of these considerations, we propose the following modification of the famous Areeda-Turner rule for the determination of predatory pricing based on two steps:

1) 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.

2) the Antitrust Authority should evaluate the relation between price, average total cost (ATC) and average variable cost (AVC):

a) a price above ATC should be lawful without exceptions;

b) 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;

c) a price below AVC should be presumed unlawful with the burden of proving the contrary on the undertaking, through an efficiency defense or proving that demand or technological conditions (as the presence of network effects or multi-sided demand) reduce the relevant cut-off below the AVC.¹⁶

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 monopolise the market and recoup its initial losses with higher prices. But, this is impossible when entry to competition in the market is endogenous (there is no way to recoup losses by increasing future prices if a price increase attracts entry). Such recoupment is also extremely unlikely when entry to competition for the market 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. 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.

¹⁵ McGee; *op. cit.*

¹⁶ Areeda, Phillip and Donald Turner; Predatory Pricing and Related Practices under Section 2 of the Sherman Act, *Harvard Law Review Issue 88*; 637-733; 1975.

Mergers and Cartels

In this section, we want to point out some implications concerning the other two main fields of antitrust policy: mergers and collusion.

The endogenous entry approach delivers a related and strong result on horizontal mergers. As is well known, even in the absence of cost efficiencies, 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. For the same principles derived in our discussions on the behaviour of market leaders and on strategic commitments (a merger can be seen as a commitment to accommodating behaviour), the effects induced by a merger are counterproductive for the merging firms whenever entry is endogenous. Once again this is due to the fact that under endogenous entry any accommodating strategy attracts new entry and reduces profits.¹⁷ Therefore, the only rationale for mergers in markets with endogenous entry must be a cost efficiency large enough to (more than) compensate the strategic disadvantages associated with the merger. In these cases, mergers are welfare improving. Clearly this conclusion is once again in line with the Chicago school.¹⁸

The endogenous entry approach can be also useful for understanding the conditions under which price fixing agreements harm consumers. Cartels always lead to higher prices and lower welfare when the number of firms in the market is exogenous. However, as long as entry in the market is endogenous, collusive cartels are ineffective for the usual motivation: they induce accommodating behaviour which simply attracts new entry. Therefore, any price fixing agreement between all the market participants can be seen as collusive and harmful, while greater care is needed when the alleged agreement is limited to a subset of the firms active in the market: entry conditions must be evaluated in such a case.

Conclusions

We have reviewed the results of the recent literature on the endogenous entry approach to antitrust. The main insight of this literature, in line with the old but sometimes forgotten contributions of the Chicago approach, is that the entry conditions should play a major role in any antitrust investigation. Whenever entry into a market can be regarded as endogenous, spontaneous market forces can guarantee efficiency better than generous policy intervention.

¹⁷ Motta points out that "the firms' ability to raise prices after a merger is also limited by the existence of potential entrants. Firms which would find it unprofitable to enter the industry at pre-merger prices might decide to enter if the merger brings about higher prices or lower quantities. By anticipating this effect, post-merger prices might not rise at all". Motta, Massimo; *Competition Policy. Theory and Practice*; Cambridge University Press; Cambridge; 2004. On the endogenous entry approach to mergers see also Erkal, Nisvan and Piccinin, Daniel; *Horizontal Mergers with Free Entry in Differentiated Oligopolies*; mimeo; University of Melbourne; 2007.

¹⁸ See Bork and Posner, both *op. cit.*