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ECONOMIC FOUNDATIONS OF ANTITRUST LAW: AN INTRODUCTORY OVERVIEW*

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Summary

Introduction

Monopolies are bad for consumers individually, and for society as a whole.

We shall provide in the next chapter a formal proof of this, but it is intuitive that a monopolist, in order to increase prices, will reduce the quantity of the product he sells. Therefore, purchasers of the product will lose out as they will be able to buy less, but at higher prices. Thus, the first negative effect of a monopoly, is to transfer some income from the purchasers to the monopolist. This is commonly known as the private loss from monopoly.

Some other consumers will be discouraged from buying the product which is sold by the monopolist. Some transactions that would have taken place without the monopolist, do not take place because the price is too high. As it is reasonable to assume that the good sold by the monopolist provided some utility to its purchasers (otherwise there would have been no purchaser), society as a whole will lose some utility. Thus, the second negative effect of a monopoly is to deprive society as a whole of some utility that it would otherwise have gained. This effect is commonly known as the welfare loss from monopoly.

Monopoly however generates three further losses to society:

- As Stigler, a famous economist, pointed out "the best of monopoly profits is quiet life": in other words, a company enjoying a monopoly will not have particular incentives to make better products and to provide a better service to consumers (think of the Italian railways). Typically a monopolist will not be very keen at cutting prices, as it can pass on its higher costs to consumers. Therefore, monopolies are very often inefficient, and provide low-quality goods. This is another component of the social cost of monopoly.
- A monopolist will also be willing to fight against other firms trying to enter its market, in order to preserve his monopoly position. From the point of view of the monopolist, this is a rational policy. From the point of view of society, however, the resources that the monopolist will spend in doing so are totally wasted, as they are used to try to avoid a re-distribution of profits from the monopolist to its competitors. This is another component of the social cost of monopoly.
- Finally, there is convincing evidence that a monopoly will be slow in adopting technical progress, in the form of better production processes, or better products. Intuitively, if a firm in a competitive market is successful in adopting an innovation that cuts its production costs, it will be able to lower its prices, having a higher

profits and higher sales volume. On the other hand, a monopolist that adopts the innovation will only have higher profits, but not the higher sales volume, as it already has the whole market for itself. This is a further, very important, source of the costs that a monopoly imposes to society as a whole.

So we have several reasons to try to avoid monopolies in any market, and this is the fundamental rationale for antitrust policy.

Before we proceed, it is important to point out that antitrust policies are not limited to monopolies, but more broadly to firms enjoying a "dominant position": as we shall discuss later, the basic reason for this is that the higher the market power that the firm enjoys, the more likely it is that it will behave as a monopolist.

Therefore, antitrust policies seek to:

1. Avoid that firms coordinate their behaviour, forming "cartels", so that they are able to cease competing among themselves, and behave like a monopolist. This is the logic behind article 101 of the TFEU, and of the very tough policy decisions that lead to impose enormous fines upon cartels, and in some jurisdictions, notably in the United States, criminal sanctions against managers who organize cartels.
2. Avoid that monopolies or dominant firms are created through mergers and acquisitions. This is the logic behind the EC Regulation that sets out the necessary provisions in order to control what are generally termed "concentrations".
3. Avoid that companies enjoying a monopoly or a dominant position exclude rivals, or potential rivals, from the market by utilizing competitive instruments that it would be irrational to utilize if not in order to exclude competitors. This is the logic behind article 102 of the TFEU.

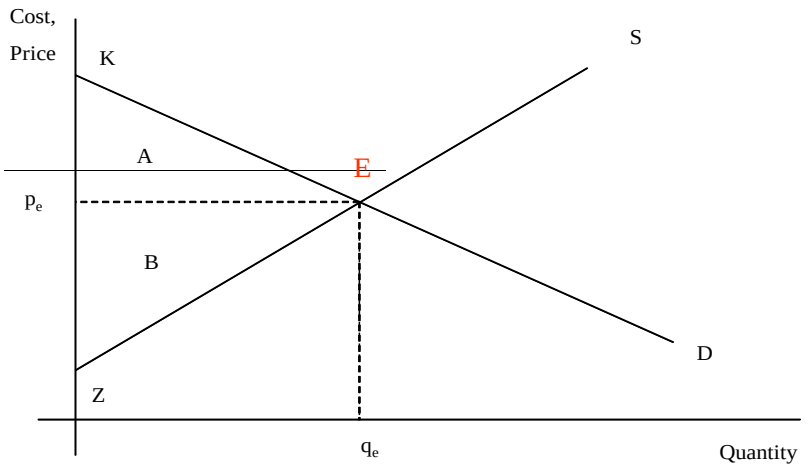
An important point to remember is that it would be irrational to forbid a company from reaching a monopoly position by providing new, better or cheaper products to consumers: Microsoft has reached its dominant position in the operating systems for personal computers by being the first to introduce several innovations. If the antitrust laws forbade or punished dominant position by themselves, they would thus discourage innovation, and this is certainly not in the interest of society.

This is the economic reason why the antitrust laws do not sanction a dominant position, but try to avoid its creation whenever this is economically rational, by controlling concentrations and limiting the exercise of market power of dominant firms.

The above discussion therefore provides us with the basic rationale for the antitrust laws. As we shall see below, these are however quite sophisticated, and a number of technical points will have to be considered.

On the other hand, the antitrust laws seek to cover some other cases that are not encompassed by the simple scheme that we used in this introduction, such as vertical agreements or the effects of concentrations upon innovative activity. Public policy problems in these cases may arise for the same reason we discussed above, i.e. the exercise of market power through agreements, or by dominant firms. However, these problems will necessitate some specific discussion.

Having summarized the rationale for the antitrust laws, let us now move to a more technical analysis. In the next chapter, we will briefly review some microeconomic concepts that we will need going ahead, and provide a more technical discussion of the costs of monopoly to consumers and society as a whole.



If any product is traded at price p_e consumers who would be willing to pay a higher price than the equilibrium price (which, therefore, express the demand between point K and the point E of the demand curve) will record a surplus (or welfare) equal to the difference between the price paid and what they were willing to pay (called the reserve price). Conversely, producers who would be willing to sell at a price lower than p_e (those between points Z and E of the supply curve) will record a producer surplus (or welfare), given by the difference between the price actually received and that to which they would be willing to sell (this is also a reserve price). Only consumers who wanted to buy exactly at p_e and producers who wanted to sell exactly at p_e would not get any surplus.

In light of the discussion, it is evident that the triangle A in the figure will measure the consumer surplus, i.e. the surplus of all consumers, and that of

the triangle B the producer surplus. The sum of the two triangles represent the benefit or social welfare, that the community of sellers and buyers would get from the exchange.

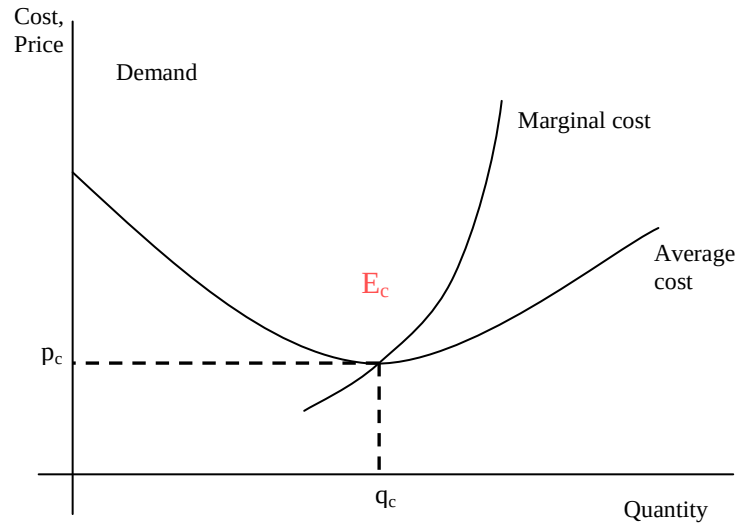
1.2 Perfect Competition

The perfect competition model is an abstraction and in reality only a few markets (like those of certain commodities) have similar characteristics. In economics, however, it has a central role, because it helps show how, under some conditions, markets can maximize social welfare. By contrast, the model allows also to understand what are the costs to the community imposed by a monopoly. It is therefore very important for understanding the economic foundations of *antitrust* action.

Consider a market in which a homogeneous product is traded, and there is a plurality of consumers and producers, which all employ the same technology. The characteristics of the product are known to all market participants, none of which is large enough to influence, through their purchasing and selling decisions, the market price (in other words, competition is *atomistic).* Suppose further that any company can freely enter the market and, decided to get out, would not have to bear any sunk costs. In other words, we assume that this market is perfectly contestable.

Supply and demand will determine, as we have just seen, an equilibrium price in this market. If we look at it (Figure 1.2) considering the cost curves of a generic company operating in this market, we get three very interesting results.

Figure 1.2 *Equilibrium of the firm in perfect competition*



In equilibrium, price (p_c) is equal to marginal cost. In fact, if price is above marginal cost, the company will expand its *output*, and will reduce it if the price is lower than the cost. In equilibrium, therefore, the firm chooses to produce that level of output at which marginal cost equals the market price. Therefore, in perfect competition an 'allocative efficiency' is achieved, in the sense that the good is sold when the price that consumers are willing to pay for an additional unit is exactly equal to the cost that the company incurs to produce it.

Price is also equal to average cost. If it were higher, the company would record a profit. But, since companies can freely enter the market, many of them would do it to enjoy of that profit. This would increase supply and drive down the price, reducing profit itself. Conversely, if the price were lower than average cost, companies would exit the market, supply would decrease and the price would rise. That's why, in equilibrium, price will have to match exactly the average cost. Since then, as we have just seen, marginal cost is equal to price, we will also notice that average cost and marginal cost are equal. As we have seen above, however, this equality can only occur at the minimum average cost curve. We conclude that, in equilibrium, production takes place at the lowest possible average cost: in perfect competition we achieve also production efficiency.

In the model of perfect competition no company can then enjoy a positive economic profit. This result may seem surprising considering that companies aim is to maximize profits. In fact, this conclusion depends on the definition of production cost, which in economics is broader than that normally used in accounting and includes - in addition to items we normally consider as costs (materials, labor, depreciation, etc.) - also the remuneration of invested capital, at an average market rate[1]. We therefore should say more precisely that, in equilibrium, in the perfect competition model, no company can make a super-profit or a profit at a rate higher than the average market price.

1.3 Monopoly and its costs

Figure 1.3 presents the equilibrium in a monopolistic market, where there is only one manufacturer and the entry of other firms is impossible because of very high barriers to entry, which may be of various kinds: technical (at least until a few years ago, Microsoft had, thanks to its technology, a virtual

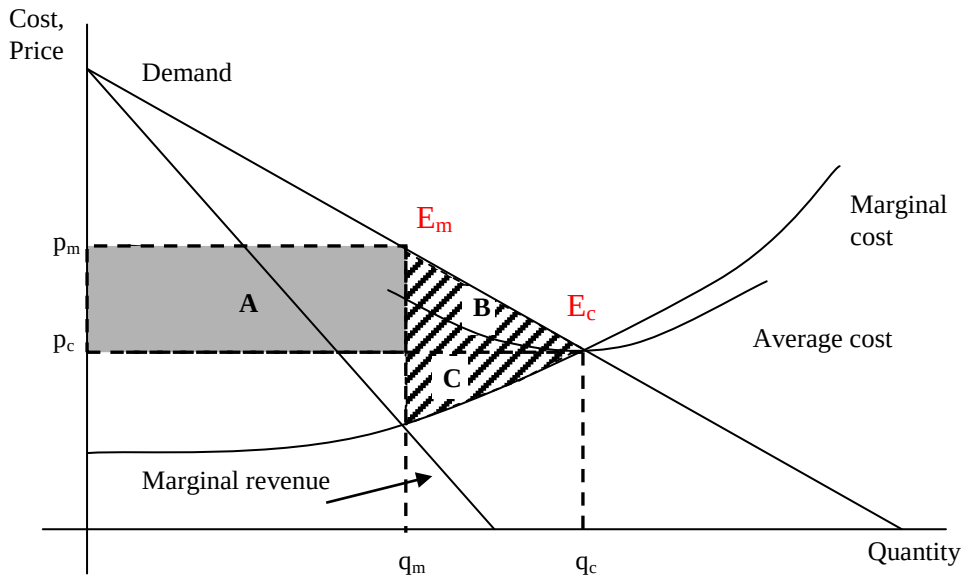
[1]This definition follows naturally from the notion of opportunity cost: given that investors may invest their money elsewhere in the economy, if they choose to employ them in one particular firm, they should receive a remuneration at least equal to that, on average, would get by investing elsewhere. This return is therefore a cost that the company has to bear in order to attract investors.

monopoly in PC operating systems), economic (as we have seen, a network of gas transmission implies fixed costs of such significance as to constitute a natural monopoly) or legal (Italian law subject lotteries to the State control, which shall grant concessions to the companies chosen from time to time).

This market is very different from the perfectly competitive one discussed in the previous paragraph: there is only one company and, therefore, not only its supply curve coincides with the market supply curve, but the demand curve the monopolist faces is the market demand curve that slopes downwards.

This fact has an important consequence. Unlike companies that work in a competitive environment, the monopolist doesn't decides how much to produce on the basis of the rule marginal cost = price. In competition, the revenue that a company derives from an additional unit sold (or marginal revenue) is equal to the market price, as the additional unit is too small to influence the market equilibrium price. On the contrary, a monopolist, in order to sell one additional unit, must slightly lower the price since the market demand curve is negative inclined. Therefore the monopolist decides how much to produce on the basis of the rule: marginal cost = marginal revenue, and it will then sell the quantity q_m at the price the market will be willing to pay for that level of production, and this is the price p_m.

Figure 1.3 – Monopoly firm in equilibrium



If the market had not been monopolized, the quantity sold would have been q_c, that corresponds to a price equal to marginal cost, and the price would have been p_c. As we can see, market monopolization reduces the quantity sold (from q_c to q_m) and increases the price paid by consumers (from p_c to p_m). Monopoly, therefore, is neither efficient in the allocative sense (the product is sold at a price higher than its average production cost), nor in the sense of production (since the production does not occur at the lowest possible cost: the monopolist produces too little output). The monopolist gets a monopoly profit (which sometimes is referred to as monopoly rent).

The monopolist is inefficient, and therefore the shaded areas B and C measure the resources destroyed by the existence of the monopoly, i.e. purchases (area B) and sales (area C) that would have taken place if the market price had been equal to the competitive price p_c, but do not take place at the monopoly price. This is often called the deadweight loss arising from the existence of the monopoly.

Area A represents a portion of consumer surplus that is appropriated by the monopolist, that can enjoy an extra-profit. Unlike the deadweight loss, these resources are not destroyed, but are transferred from consumers to the monopolist: it is sometimes argued in the U.S. that their existence should not be a particular antitrust issue. However, the traditional point of view of competition authorities in Europe is very different: our approach to antitrust seems to prevent not only the destruction of resources (areas B and C), but also the transfer of income from consumers to the monopolist (the rectangle A). Such a deadweight loss can be very large: the most recent estimates - referred to the entire economic systems – put it for the United States at between 4 and 13% of GDP and, for France, to 7,4% of national GDP. These costs are therefore very high, as each percentage point of U.S. GDP is about 120 billion dollars, and every point of French GDP about 20 billion euro.

There are several other social inefficiencies created by monopolies.

It is very likely that the monopolist, that does not face any competitor, is not committed to contain its production costs, since he can pass them on to consumers. It is therefore likely that monopolist's costs are higher than necessary (this cost of monopoly, from a famous Henry Leibenstein’s study is known as X-inefficiency).

Monopoly also creates other types of cost to the community which, unlike those considered here, have a dynamic nature.

First, the monopolist will be willing to spend considerable resources just to maintain its monopoly position. These will be at least equal to rectangle A in figure 1.3, since this is the excess profits enjoyed by the monopolist. As

these resources are used to maintain an inefficient position, they are certainly wasted from a social perspective.

Secondly, it is likely that a monopolist, other conditions being equal, is less inclined to introduce process innovations than a company in competition: the latter, if it manages to lower its costs below those of its competitors, can hope to conquer the entire market. Instead, the monopolist already has the entire market, and thus its expected increase in profits is lower.

Thirdly, it seems likely (at least according to the experience offered by the most technologically innovative sectors) that a monopolist is also slower to introduce product innovations. In fact, the monopolist does not have any particular incentive to beat the competition by offering consumers products that incorporate more advanced technology. Indeed, if the plants that produce the old product are not fully amortized, the monopolist has a strong interest not to introduce an innovative product.

Finally, further negative effects of monopoly may arise from the fact that the community cannot enjoy of the benefit of investments that could be made by new entrants in the sector.

Monopolies thus impose significant costs - both static and dynamic - to the community. For this reason, antitrust law is dedicated to prevent their creation, and to make difficult their perpetuation.

1.4 Oligopoly

A market in which there is a small number of companies is called oligopolistic.

The presence of a few firms may be the result of several factors: technology (the construction of large civil aircrafts is an activity in which the high research costs generate economies of scale so important that there are only two manufacturers in the world); regulation (in each European country only a few mobile operators have been licensed to operate by their governments), or other market characteristics (where advertising is very important, as for soft drinks, the level of advertising investment is high enough to generate economies of scale). So, there is nothing particularly sinister in an oligopolistic market, and there are both highly concentrated oligopolies (the production of large civil aircraft), and oligopolies with a much lower concentration (such as, for example, some markets insurance).

From an economic point of view, the main feature of such markets is not so much the small number of firms, but rather the interdependence that binds the companies that compete on them. Whereas in perfect competition each firm is too small compared to the market, so its choices are not relevant to the choices of other firms, in an oligopoly the opposite occurs: thus, for

example, when a European car manufacturer has to fix the price of a new model, it will consider not only its own costs and other manufacturers' prices but it needs also to form some expectation about their probable reactions to the launch of its new model.

The study of oligopolies is very complicated, and uses complex mathematical tools, such as game theory. For our purposes, however, it is sufficient a simplified summary, examining the two major strategies that the members of an oligopoly can choose (collude or compete) and discuss how an oligopolistic market can reach equilibrium. To simplify the discussion, we refer to the simplest type of oligopoly, duopoly, and assume that products are homogeneous.

1.4.1 Collusive oligopoly

When two duopoly firms collude by coordinating their choices of quantities produced and prices charged, they give life to a *perfect cartel*, in the sense that they behave like a monopolist, and are therefore able to obtain monopoly profits. Is this enough to conclude that in an oligopoly firms will tend to collude rather than compete?

The answer to this question is negative, as can be seen considering the Figure 1.4. This indicates the level of profit that the two duopolists can expect, for example, when they are both about to introduce the same new product, and each needs to decide whether to set a high price, or a low price. Of course, the profit of each company will depend both on its choice, and on the competitor's choice, as consumers will respond to the choices of both. So, if both companies chose - colluding - to charge high prices, the profit of each would be, in the example, 100.

Figure 1.4 - C*ollude or compete?*

		B chooses a price: High	B chooses a price: Low
A chooses a price	High	100,100	0,150
	Low	150,0	50,50

However, if Company A decides to set a high price, it should also take into account that B, rather than collude and make a profit of 100, may decide to set a low price, to try to conquer the whole market and achieve a profit (say) equal to 150, and therefore higher than the profit it would gain colluding with B: in other words, B has a rational incentive not to collude, because - in so doing – it could achieve an even higher profit than it would achieve choosing to collude. But if A expects that B is going to choose a low price, so capturing the entire market, A will also be obliged to choose a low price: if it chooses instead a high price, it would not sell anything. Since Company B also will do the same reasoning, market equilibrium will be achieved at a low price for both companies. In this situation, each of them will gain 50, which is much less than profit they would have earned if they could collude without fear of cheating by the other. The collusive solution (100,100) is therefore desirable, but would not be stable because, as we have seen, each of the two companies would have a rational incentive to cheat the collusive agreement[2].

So, it is rational not to collude, but collusion (as the antitrust agencies well know) is widespread. According to a recent study, which reviewed over 600 cases, cartels raise prices by a minimum of 43% to a maximum of 72%: there must be some factors that facilitate collusion, and this will be discussed in detail in Chapter 3 below.

1.4.2 Non-collusive oligopolies

A non-collusive oligopoly, also called competitive oligopoly, is therefore quite possible even in a highly concentrated market as a duopoly. Boeing and Airbus, Coca-Cola and Pepsi, are duopolists which compete fiercely. Such a market may reach different types of equilibrium, depending on the characteristics of demand and, in particular, on how the firms are competing.

If in fact we tend to instinctively identify the notion of competition with that of price competition, firms may compete in other ways: for example, when decisions concerning the quantity that will be sold are made long before decisions concerning prices (consider Air France that announces it will add one flight per day between Milan and Paris from next year), companies can compete by offering higher or lower amounts of product (i.e. a big plane or a small plane).

[2] The solution (50.50) is rather stable, since for each of the two companies adopting this strategy is optimal, assuming (as it is rational to do) that the other firm also pursues an optimal strategy: this is an example of Nash equilibrium.

Business strategies and results, in terms of quantities, prices, and profits are likely to be somewhat different when firms compete on prices or on volumes.

Firms may also compete by offering differentiated products (think of corn flakes)[3]. Also, one firm may be recognized as the leader, and the others will adjust their price and output decision to the leader's decisions.

Thus, the economics analysis of oligopolies is very complicated, but we do not need to study it in this course.

What we need, is only one of its more intuitive results: no matter how an oligopoly competes, in most cases it will generate higher prices than in perfect competition, but lower prices than in a monopoly. Social welfare is thus lower than in perfect competition, but is higher than in an oligopolistic market if the firms, rather than compete, collude.

This is interesting from a policy point of view: oligopolists should be pushed to compete against each other. This will never make consumers as better off as they would be under competition, but it is a lot better than cartels, which produce prices and quantities similar to those of monopolies, and are thus very bad for social welfare.

1.5 Competition Policy

The above discussion explains why we need competition policies, in order to:

1. Avoid that firms coordinate their behaviour, forming "cartels", so that they are able to cease competing among themselves, and behave like a monopolist. This is the logic behind article 101 of the TFEU, and of the very tough policy decisions that lead to impose enormous fines upon cartels, and in some jurisdictions, notably in the United States, criminal sanctions against managers who organize cartels.
2. Avoid that monopolies or dominant firms are created through mergers and acquisitions. This is the logic behind the EC Regulation that sets out the necessary provisions in order to control what are generally termed "concentrations".
3. Avoid that companies enjoying a monopoly or a dominant position exclude rivals, or potential rivals, from the market by utilizing competitive instruments that it would be irrational to utilize if not in order to exclude competitors. This is the logic behind article 102 of the TFEU.

[3] We will discuss differentiated products in the next Chapter.

But are we really sure that we need to take cartels and monopolies [or, to be more precise, *dominant firms*] so seriously as to build a rather complex body of public policy to deal with them?

For cartels, the answer is clearly positive in the light of our discussion above. It is true that cartels are unstable, but they may be made to be stable through the sharing of information among cartel members, and [we shall discuss this in more detail in the coming chapters] by adopting policies that enforce cartel rules vis-à-vis cartel members. Cartels are also extremely damaging to consumers and society, and therefore even if instability were to prevail sooner or later, public welfare could suffer substantial losses in the intervening period. For all this, we certainly need a policy against cartels.

However, there are contrasting views on dominant firms, and two reasons are frequently given in order to advocate a more *laissez faire* policy: in several cases, even a true monopolist may actually behave as a competitive firm; secondly, all monopolies are temporary, and – sooner or later – competitors will enter the monopolist's market, and competition will prevail. Thus, we should not bother limiting the market power of dominant firms: the market will take care of itself.

This view is historically very important, as it has led to weak competition policies in the U.S., especially during the Reagan and the Bush years. It is not correct, but it holds interesting grains of truth, and should be considered.

If a monopolist was operating in the market where there are no barriers to entry, i.e. where new competitors could begin operating in a reasonably short time, it would not be rational for it to behave as economic theory would predict, decreasing output than increasing prices. If it did so, the monopolist would enjoy high profits, but such profits would attract entry by new competitors who would void the basic strategy of the monopolist: decreasing output would fail to increase prices, as actually output will not fall in such a *perfectly contestable* market.

This theory tells us an important truth: pricing decisions find a limit in the threat of entry by competitors. As we shall see, when we analyze the relevant market, we will have to take into account the probability of entry by new competitors. On the other hand, perfectly contestable markets are really very rare, as barriers to entry are created by exogenous factors such as technology [in many industrial sectors it is impossible to build a plant below a certain productive capacity], or by endogenous factors, being actually built by dominant companies [advertising is a typical example]. So, this observation is not sufficient to convince us to relinquish all antitrust weapons against monopolies.

On the other hand, it is true that dominant positions are often eroded. Microsoft was the first company to produce an effective operating system

for personal computers, and enjoy it for a long time a quasi-monopoly, but Apple, and operating systems based on Linux, have been substantially eroding its market position, so that probably Microsoft is not anymore a dominant company in operating systems for personal computers. Geographical monopolies are also eroded: for many decades, the market for cement in Sardinia was highly concentrated, and prices diverged from the those in the rest of Italy. Gradually, infrastructures were built in ports that allowed the unloading of cement. The Sardinian market for cement became contestable, and prices fell. Even legal monopolies such as patents are eroded : the first generation of mobile phones that came out in the early 1980s was protected by a number of patents, which were quickly made irrelevant by technical progress.

So is this a valid reason to adopt a lenient stance towards dominant firms?

No. The first obvious reason for this is the above argument we developed for cartels: the welfare cost that society bears in the period, which may be very long, before the monopoly is dissolved by competition, can be substantial.

There is however a different argument : in some special, but very relevant, cases, a monopoly may be irreversible, or at least persist for a long time.

In basic microeconomic theory we usually assume that consumers can switch from one product to another without incurring any adjustment costs. But this is obviously a highly simplifying hypothesis: if I want to stop using my Blackberry and switch to an iPhone, I need to spend a few hours getting familiar with the new telephone, moving my contacts and my e-mails from one to the other and so on. This is a simple example of switching costs for consumers. Switching costs exist also for manufacturers, and they can be substantial [think of the equipment changes that would be induced in car production from using plastic instead of steel in a particular component]. If switching costs are relevant, a company establishing a dominant position in the market will enjoy it for a very long time, even if it is faced by many competitors, as these competitors will have to offer products which are so much better, or so much cheaper, than the monopolist's, as to make it reasonable for customers to bear the switching costs. In the presence of switching costs, dominant positions are more difficult to erode.

Other effects which may produce a permanent monopoly position are "network effects". A consumer of a normal good [e.g. ice cream] derives an increase in utility from increasing quantities of ice cream, at least up to a certain point: this is why he would be willing to pay a higher price for a bigger ice cream. This is true also of telephone calls to one’s friends: I am ready to pay more if I talk more. But this is not the full story, as my utility as a telephone subscriber depends on the number of people who subscribe to the same network: this is true of physical networks [telephones] but also of

logical networks, such as Facebook, Twitter; or Microsoft Office [try interoperating in different brands of spreadsheets, and you will find out]. It may also be the case for search engines such as Google, VOIP services such as Skype, and so on. In these cases, once a network operator reaches a critical mass of subscribers or users, it is very difficult for another firm to compete with it. This may or may not be a sufficient reason for aggressive antitrust actions towards these companies, but we do not need to pursue the matter any further: the economics of networks is a complicated issue, and what we briefly said so far should be enough to clarify that where network effects are relevant, dominant positions may be permanent, or at least very long-lasting. Thus, in the presence of network effects, dominant positions are more difficult to erode.

Thus, we should conclude that there is indeed scope for competition policies, and we turn now to a more technical discussions of how they are implemented.

2. Market definition

2.1 Introduction

In any antitrust case, the vital first step is to define the relevant market. As the European Commission states *"Market definition is a tool to identify and define the boundaries of competition between firms. …The main purpose of market definition is to identify in a systematic way the competitive constraints that the undertakings involved*"[4].

The criteria for defining markets, as we shall see below, are economic criteria, which have been efficiently cast in legal terms in order to provide a structured assessment of the competitive effects of mergers by competition authorities, and later applied to cartel and abusive conduct cases.

In practice, market definition serves different purposes when addressing different competition issues: in mergers, it allows to identify the competitive constraints that the merged entity, and its competitors, will face, and so to anticipate their future behaviour; in abusive conduct cases, it allows first to assess if a firm should be considered as dominant, and secondly to evaluate the consequences of its actions upon customers and possibly competitors; in cartel cases it makes it possible to evaluate if the agreement should be considered as horizontal or otherwise, and again to evaluate its consequences.

To define correctly the relevant market, we must necessarily take into account three types of substitution, namely: (a) substitution on the demand side, i.e. the existence of goods that consumers may be willing to substitute to the good we are considering; (b) supply-side substitutability, i.e. the existence of producers than can replace in a reasonable time, with their offer, the undertaking concerned by the antitrust case, and (c) potential competition, i.e. the possibility that, again in a reasonable time, new firms may enter the market by offering products that consumers consider as substitutes.

The relevant market definition based on the analysis of substitution can lead to very different conclusions from other definitions, such as those commonly used in strategy or marketing, which may reflect company organization, the areas it works in, or other factors, but that has nothing to do with the existence of substitutability in demand or supply: in the market of air transport, each route represents – from an antitrust point of view - a distinct relevant market, because passengers cannot substitute a Milan to Seville trip with a Milan to Madrid trip.

[4] Commission Notice on the definition of the relevant market for the purposes of Community competition law, Official Journal C 372 on 9 December 1997, par. 2.

This is not how an airline executive would probably see the market (he would probably think of the Italy-to-Spain market): relevant market definition for *antitrust* purposes is essentially instrumental, as it is aimed at evaluating a specific case.

Thus, market definition may depend on the nature of the analysis carried out by the competition authorities: in case of agreements or abusive behaviors authorities will look at the market as it was when the relevant behavior took place. In merger control, they will assess the effects of the merger on the basis of how the market will be in the future.

2.2 The relevant product market

The typical steps in the analysis of the relevant market are basically three:

- On the demand side: evaluate the degree of substitutability of product A with other existing products, from the point of view of demand. This is usually done by applying an 'hypothetical monopolist' test, i.e. trying to gather how consumers of (say) pears will react to a SSNIP, that is to a Small but Significant, Non-transitory, Increase in Prices, usually taken to be of 5-10%: if they switch to apples, pears and apples belong to the same relevant market, if (most) consumers keep buying pears, pears alone form a relevant market (demand substitutability).
- On the supply side: assess the likelihood that existing suppliers of other products will readily begin offering substitutes to A (supply substitutability).
- Again on the supply side: assess the likelihood that new suppliers will begin offering substitutes to A in a reasonably short time period (potential supply substitutability).

Usually, demand substitutability is taken as the fundamental criterion, and supply substitutability as the secondary criterion. But "*potential competition, is not taken into account when defining markets, since the conditions under which potential competition will actually represent an effective competitive constraint depend on the analysis of specific factors and circumstances related to the conditions of entry. If required, this analysis is only carried out at a subsequent stage, in general once the position of the companies involved in the relevant market has already been ascertained, and such position is indicative of concerns from a competition point of view*"[5]

From the economists' point of view, such a hierarchy is however questionable: it is not always the case that customers can switch their

[5] *Ibidem*, par. 24.

demand more quickly, and bearing lower adjustment costs, than competitors may switch supply: on the one hand, consumers may be handicapped by switching costs, and on the other, in several types of economic activities, entry can be very fast, through trade, use of existing delivery channels, or electronic channels, and thus potential entrants should often be included in the relevant market. Their traditional exclusion in EC competition rules probably reflects a sort of 'manufacturing bias', i.e. the view that, in order to enter a market, large investments in productive facilities are necessary: but of course this is not always the case.

In practice, such a two-stage analysis may lead to underestimating the role of potential suppliers. In any case, the speed of entry by new suppliers may matter much less than the expectation that entry may occur: if the rational producer of A expects that, if it practiced a SSNIP, producers of B would start producing A in three years, it will never increase prices. A threat of entry tomorrow has a disciplinary effect today: A and B already pertain to the same relevant market.

Thus, in most cases, it is probably better to consider together the competitive pressure arising from actual and potential supply substitutes at the same time in which competitive constraints arising from demand and existing suppliers is considered.

Let us review in some detail each of these steps.

2.2.1 Demand-side substitutability

Demand-side substitution is considered the most "*immediate and effective disciplinary force on the suppliers of a given product, in particular in relation to their pricing decisions*"[6]: if consumers are able to easily switch to other products, a company will not be able to increase its prices.

To check for this, we usually utilise a Hypothetical Monopolist Test or SSNIP test. SSNIP stands for 'Small but significant and Non-transitory Increase in Price'. This test, originally introduced in the U.S. Horizontal Merger Guidelines is based on examination of the available evidence, in order to predict the likely behavior of consumers faced with a small, but permanent, price increase of 5% or 10% If, following the rise, consumers would immediately switch to other products, and the decrease in sales would be such that the price increase proves to be unprofitable, then the relevant market, for antitrust purposes, should include also other products. If following an increase of 5% -10% of the sea bass price, consumers respond by consuming more sardines, to the point that the bass price increase is not profitable for fishermen, then the relevant product market in

[6] Commission Notice, § 13.

the antitrust sense should include both bass and sardines. Of course, this conclusion does not require that all consumers perceive sea bass and sardines as easily replaceable. These products should however be perceived as such by a number of consumers large enough so to make unprofitable the increase in the price of sea bass.

How then to define the relevant market in this case? Obviously, you must repeat the test, analyzing the consequences of a 5-10% increase of both sea bass and sardines prices. If consumers respond by buying more anchovies, it is evident that sea bass, sardines and anchovies belong to the same relevant market. This process continues until a set of products will be identified (in our case, probably, 'fish') that consumers can not easily replace with other products (meat). Only this set of products would be, in our example, a relevant product market, as it contains all the goods that are perceived by consumers as easily replaceable to each other, and excludes those which are not. In the 'fish market' an "hypothetical monopolist" could then profitably raise the prices of all fish, but would be unable to profitably increase the price of sea bass alone.

Of course, for practical purposes, the SSNIP test is applied in practice only considering a small number of possible alternative markets: in our case, it would most likely be applied only to the market for sea bass and for fish in general.

How do we use the SSNIP approach in practice?

If we have abundant data on consumer behavior, we can try to estimate demand elasticities.

The elasticity of demand for a product can be defined as the percentage change in demand following an increase of 1% in price: if the reduction in demand is greater than 1% , then we say that the demand for that product is elastic, while if the reduction is lower, it is said that the demand is inelastic, or rigid. If the demand for a product is inelastic, consumers cannot easily substitute the product with other products, and it is likely that a price increase made by the "hypothetical monopolist" would be profitable.

In practice, in order to estimate the elasticity of demand for a product, we can use econometric techniques, that are particularly useful in cases where there is a wide availability of data that allow the monitoring of the consumption habits of individuals (for example supermarkets have wide data set on their customers)[7]. However, assessing the validity of an econometric model can be very difficult, and thus such models are perhaps

[7] An ambitious undertaking would be to build an econometric model in order to directly estimate demand cross-elasticities (if the demand for apples increases substantially with an increase of the price of pears, then apples and pears most likely belong to the same relevant market).

able to provide useful evidence in front of (specialised) antitrust authorities, or when the Court is able to rely upon a competent econometric expert.

Happily, we can often avoid econometric models, and use simpler approaches, such as correlation: the prices of two products which are easily replaceable should have a high correlation over time[8]. If they have a low correlation, it is likely that the two products are not easily substitutable, and therefore do not belong to the same relevant market.

Another method widely used in practice to analyse the substitutability from the demand side is to refer to consumer preferences, considering their loyalty to a product through market research. As the Commission points out[9], market studies carried out by companies in the past may provide useful information for defining the relevant product market. In some cases, ad-hoc surveys[10] may also be used.

SSNIP test can be however misleading for cartels: while the standard SSNIP test asks what would happen if an undertaking increased prices by 5 or 10%, there is abundant evidence that cartels increase prices by much more, 20 – 30% being a reasonable estimate[11]. Thus, standard SSNIP tests are likely to define markets which are too small: consumer may not switch to apples if pears' prices rose by 10% (hence they would seem to be in different relevant markets), but may behave very differently if prices rose by 30%: apples and pears may be in the same market, after all.

As already discussed, the relevant product market definition is based primarily on an analysis of substitutability on the demand side. There is a further case where a mechanical use of the SSNIP test can lead to biased results, leading to define too wide a relevant market: the so-called "cellophane fallacy".

The SSNIP test requires, as we saw, to measure consumers' behavior following a 5% -10% hypothetical increase of the product price. However, the substitutability of products is not independent of the level of prices: in a competitive fish market, sardines (easy to catch) are cheaper then lobsters (hard to catch); let's assume that lobsters are four times more expensive than sardines. Consumers will consider, to some extent, the two fishes as

[8] This technique is frequently used in antitrust. Among the cases in which the Commission has used correlation test to identify the relevant market price of the product, we can mention: the case M.315, decision of 31 January 1994, *Mannesmann / Vallourec / Ilva,* the case M.190, decision 22 July 1997, *Nestlé / Perrier,* in OJEC [1992] L 356 / 1, M.619 the case, decision of April 24, 1996, *Gencor / Lonrho,* case M.938, decision of 15 October 1997, *Guinness / Grand Metropolitan,* OJ [1998] L 288/24.

[9] Commission Notice, § 41.

[10] See, for example, case M.68, Commission decision of July 19, 1991, *Tetra Pak / Alfa-Laval,* in OJEC [1991] L 290/35.

[11] Connor J.M., 2005, *Price–fixing overcharges: Legal and economic evidence,* Purdue University Staff Paper

substitute goods, but it would be necessary a remarkable increase in the price of sardines in order to convince a considerable number of consumers to switch from sardines to lobsters. Antitrust authority would conclude that, on the basis of a SSNIP test, sardines and lobsters do not belong to the same relevant market because their elasticity of substitution is low.

But if, suddenly, the sardine market became a monopoly, and the price of sardines approached that of lobsters, there would be a greater number of consumers who, facing a strong increase in the price of sardines, will switch to lobsters. A SSNIP test would therefore suggest that the two products belong to the same relevant market, but this conclusion is incorrect, because the high substitution degree is the consequence of the sardines market monopolization.

To avoid drawing improper consequences from a SSNIP test, an antitrust authority should therefore consider that the price of products considered is not too far from its (theoretical) competitive level. If it is, it would be necessary to assess how customers would behave if the price was not artificially raised by a cartel or a dominant firm.

2.2.2 Supply-side substitutability and potential competition

There is supply-side substitutability if, following a price increase of a certain good, other companies that produce it react by increasing production, thereby reducing (or even voiding) the success of the price increase. Thus, there is supply-side substitutability when - in response to small, permanent changes in prices - suppliers are able, in a reasonably short time, to modify their production process in order to place on the market larger quantities of the product the price of which is increased, without incurring significant additional costs.

Competitors' reaction occurs naturally in most cases, but its effectiveness is not always comparable to the consumers' reaction: these can frequently and quickly alter their consumption choices, but firms need time to change production processes and the distribution chain. For this reason, in defining relevant market, the Commission has considered substitution on the supply side as the relevant criterion to define the relevant market only in a small number of cases, in which alternative producers were deemed able to change their processes rapidly, and without incur excessive adjustment costs, as additional investments or complex strategic decisions were not required.

In some cases, increase in prices, in addition to consumers and competitors' reactions, could give rise to entry processes in the relevant market, prompting companies that produce something else, to enter the market. In this situation, a "hypothetical monopolist" would not be able to profitably

raise the price, since the entry of new firms would lead to an increased supply and lower prices. The competitive pressures generated by potential competition are not immediate, because the decisions of entry into new markets are typically complex choices, which depend on a variety of factors, and therefore can hardly be determined solely by the increase in price by the "hypothetical monopolist".

Potential competition is therefore only rarely considered to be relevant to the definition of the relevant market. However, as we discussed, expecting a rival to entry the market may effectively dissuade a firm from increasing its prices.

2.3 The relevant geographic market

A relevant geographic market is, by definition, an area in which the conditions of competition for a product are *"sufficiently homogeneous"* [12]. Of course, this homogeneity also depends on the existence of substitutability phenomena: there is substitutability in a geographical sense if, as a result of the increase of the price of a good in a given area, consumers are willing to travel to other areas to buy the product in question, or producers in other areas are willing to sell their products in that area.

For example, suppose that the price of a given brand of beer in Milan increases by 5%-10%. If, following this price increase, consumers are willing to travel as far as Pavia to buy the beer, or it is profitable for beer wholesalers to travel to Milan from Pavia to sell the beer, it is possible to conclude that Milan and Pavia belong to the same relevant geographical market for beer.

This test is analogous to the SSNIP test used for the relevant product market. If there is substitutability between the two areas, then both are part of the same relevant geographic market, because Milan wholesalers would not be able to exercise their market power by raising the prices of beer, as they are exposed to competitive pressures, both by consumers and by wholesalers located in contiguous areas.

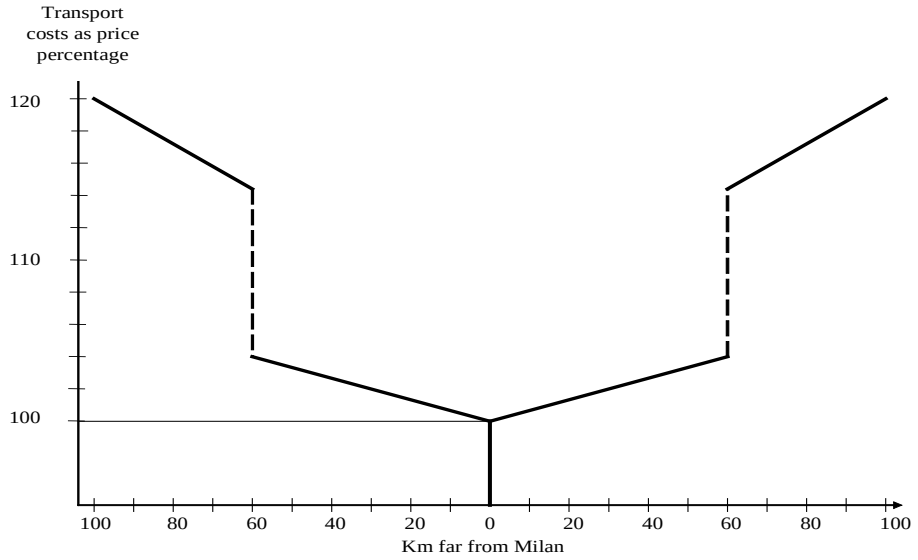
As can be seen from the example, the relevant geographic market extension depends not only on the elasticity of supply and demand, but also on the product transport costs. Beer wholesalers of Pavia will travel to Milan only if the price in Milan is high enough to cover their transport costs: otherwise, they fail to obtain reasonable profit margins from the sale of beer, thus they would better stay in Pavia.

In general, the higher is the importance of transportation costs vis à vis the product price, the smaller will be the relevant geographical market.

[12]Commission Notice, § 8.

Figure 2.1 shows the hypothetical variation of transport costs as a percentage of beer price in Milan: up to a radius of about 60 km from Milan, these account for a very low percentage. As the distance increases, the incidence of transport costs grows rapidly (for example, because larger vehicles are needed, and because, beyond a certain distance, a truck can make a single daily delivery). Therefore, wholesalers with warehouses located within 60 km from Milan (that are, among others, those in Pavia) could profitably react to an increase of 10% in the price of beer, as within this distance transport costs are "covered" by the price increase imposed by wholesalers of beer in Milan. On the contrary, entry would not be profitable for the wholesalers located more than 60 km far from Milan. In our example, the relevant geographic market for beer would be limited to an area with a radius of 60 km around Milan.

Figure 2.1 - *Analysis of transport costs for beer wholesalers* [13]



In addition to the analysis of transportation costs, there are other characteristics of the market that can provide useful information on the relevant geographic market.

A first characteristic is the existence of differences between regional or national product markets: the existence of different distribution networks, of barriers to entry that may hinder appreciably the entry of competitors

[13] Source: adapted from Viscusi WK-JE-Harrington JM Vernon [1996], chap. 7.

coming from a different area, thus limiting the extension of the relevant geographic market. For example, TV-markets are national for obvious linguistic reasons, insurance market may be national due to the existence of regulatory (and linguistic) barriers, and specialized distribution networks.

2.4 Specific problems in defining the relevant market

Some markets present special problems: let us briefly review them.

2.4.1 Differentiated products

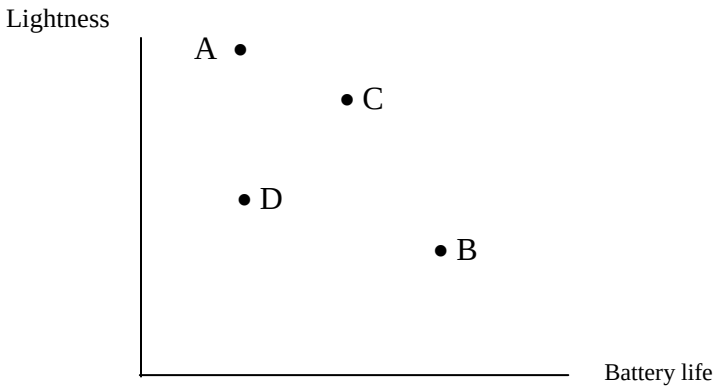
The existence of differentiated products does not pose special problems in defining the relevant market, since we can again use the various *tests of substitution* discussed above.

Before clarifying this point, it is necessary a closer examination of the economics of differentiated products. It is reasonable to assume that, especially for complex goods that consumers perceive as different from others, consumers express a demand for *features*. Thus, according to this approach, there is not, for example, a demand for mobile phones, but a demand for devices with a bundle of characteristics: enabling mobile voice communications, providing SMS and MMS services, having a certain battery life, a certain weight and other features. Now, if all equipment must have the first characteristic, some consumers will like MMS services, but others will not. Some may appreciate long-lasting batteries, others a very light device, and so on.

Figure 2.2 shows how two mobile phones, A and B, can be identified on such a basis, considering for simplicity only two characteristics: light weight and battery life. Phone A is very light but its batteries run out quickly (and will likely be preferred by young students), while the opposite is true for B (which is therefore preferred by old professors). These products are *horizontally differentiated*, as none of them is arguably "better" than the other, but each meets different needs (as it meets the demand for a different bundle of characteristic).

Which of the two phones competes with device C? As shown in the graph, C will be competing more with A than with B. In other words, a small change in the price of A will be enough to convince many consumers – that would have purchased A – to buy C; whereas a remarkable change in the price of B would be necessary to convince many consumers – that would have purchased B – to buy C.

Figure 2.2 Mobile phones characteristics



Phone D is different from the others too, but - as its batteries last less than phone A batteries and its weight is much greater - D is unquestionably worse than A, and will be chosen only by consumers who can not afford A. Products of this type are defined as *vertically differentiated*.

Let's now consider the definition of the relevant market where products are differentiated by referring to a classic case by the Italian Competition Authority which investigated whether there exists a 'milk market', including fresh milk and UHT (long-life) milk. Consumers may have different preferences: some prefer fresh milk because they use it as a beverage, others prefer long-life milk because they use it together with other foods or need to store it. Fresh milk and UHT milk are therefore horizontally differentiated products, but this does not necessarily mean that they belong to different relevant markets: to decide about this, it is necessary to evaluate consumers' behavior, following an increase in the price of one of them (of course this is a SSNIP test).

If fresh milk price increased, some consumers (also called marginal consumers) could be induced to switch to UHT milk consumption as a beverage. In order to ascertain if fresh milk and UHT milk belong to a single relevant market, it is therefore necessary to assess whether the number of marginal consumers willing to change their consumption preferences is enough to make the increase in the price of fresh milk unprofitable. The percentage of consumers switching to a different product is indicated as the *diversion ratio*. In practice, the analysis conducted on the milk market in Italy showed that fresh milk and UHT milk belong to two separate relevant markets, since the diversion ratio is low.

The same analytical framework is used for products that are characterized by vertical differentiation. Consider again, for convenience, the fresh milk market, where in addition to “fresh milk” there is also “high-quality fresh milk”, produced in selected farms and with particular organoleptic qualities. To ascertain if the normal fresh milk and the "high quality" one belong to the same relevant market, it would be necessary to carry on a demand-side substitutability analysis. Following an increase in high-quality milk price, it is necessary to analyze the share of consumers willing to replace high-quality milk with the normal one, and if this switching is sufficient to nullify the profitability of the price increase .

In case of vertically differentiated products, it may be important, in some circumstances, to ascertain whether consumer behavior is symmetric: if high-quality milk price increases, it is likely that few consumers will switch to lower quality milk , thus indicating the existence of two separate relevant markets. On the contrary, if the price of normal fresh milk increases, it is very likely that a greater number of consumers will switch to the consumption of higher quality milk, thus pointing out the existence of a single relevant market.

Therefore, the relevant product market may be defined differently in the two cases.

2.4.2 Primary markets and secondary markets

Another problem in defining relevant markets can be encountered when the product in question requires secondary products or services. For example, a dishwasher (the primary product), also need after-sales services (the secondary products).

In cases like this, the primary and the secondary product are complementary, and may belong to a single market, or to different markets.

This problem is quite relevant, as there are many companies that engage in what is called "Xerox pricing”, after the company started selling photocopying machines at cheap prices, and spares and supply materials at very high prices.

The first case is likely when consumers engage in "whole life costing", as they would do before buying a new car checking in a specialized magazine what is the likely maintenance cost for the car over its reasonable life. In such cases, if the car producer increased the price of spare parts, presumably consumers would switch to a different brand, that has lower spare parts prices: the car and the spares clearly belong to a single market. In other cases, such as laser printers and toner cartridges, the markets are likely to be separate, as, having bought a printer, a consumer can buy a cartridge from several other suppliers. Thus, if the printer producer increased the toner

prices, consumers just would go away, and in this case the primary and the secondary products belong to different markets.

2.4.3 Two-sided markets

When defining markets, it is also useful to consider in some cases a (relatively) recent microeconomic result: markets may have two sides.

Consider the printed media industry, where there is a large number of antitrust decisions by Competition Authorities that define markets in a very narrow way, on the basis of frequency, content, and geographic area, because they (correctly) assume that there is very little demand substitution because different media appeal to different groups of readers.

But very few media executive would subscribe to this view. Printed media sells both copies to customers, and space to advertisers. Thus if I increase the price of my local newspaper, relatively few readers will switch to the national press. But the loss in readers might be sufficient to trigger a loss in advertising revenues.

Thus, a printed media company operates in two highly related markets or (as economists put it) in a two-sided market: in order to stay in business it must sell copies to readers (say, at a price P), and space to advertisers (say, at a price S).

A fundamental characteristic of two-sided markets is that no inference about market power or abusive behaviour may be made considering only one of the two prices: P may be high or low (it is zero for the 'free dailies'), S may be high or low (it is zero for publications containing only classified ads): what really matters is not price levels, but rather price structures i.e. both P and S.

In particular, SSNIP tests applied only to one of the two sides of these markets will often generate incorrect results: a newspaper may seem to be a market to itself from the perspective of the people who buy its copies, but is probably in a much broader market when we consider that it draws its revenue also from advertisers.

If we omit to consider this basic feature of such a market, several errors may result: relevant markets may be too small; dominance may be found, where none actually exists, and price abuses may be found, where none really exists. (e.g. price discrimination concerning only one side of the market).

3 Market power

3.1 Introduction

Once the antitrust authorities have defined the relevant market, the next step is evaluating the ability of a cartel to raise prices, the existence of a dominant position, or to predict the effects of a merger, requires an assessment of the market power of the firm or firms concerned.

In general, market power can be defined as the ability to raise prices above the level that would prevail in a competitive market. If a firm has market power, it is able to reduce production, sell at a higher price, and achieve higher profits than in a competitive situation.

This definition is theoretically clear, but not directly applicable, since it is very difficult to know what the price in a competitive market would be. Also, the above definition is reasonable for homogeneous products, but is too simple for differentiated products, where prices will reflect the demand for characteristics, which we cannot observe directly.

Thus, we need to analyse market power from an empirical point of view, typically considering four factors: the market share of the firm; the number of its competitors and their market shares; barriers to entry; the countervailing power of customers.

3.2 Market share and market power

The analysis of market shares is in practice the main factor used to determine whether a firm has market power or not. As the ECJ has established, *"The existence of a dominant position may derive from several factors which, taken separately, are not necessarily determinative but among these factors a highly important one is the existence of very large market shares."*[14]. According to the Commission, *" market definition makes it possible inter alia to calculate market shares that would convey meaningful information regarding market power for the purposes of assessing dominance*"[15].

Such a legal tradition has a reasonable economic basis.

A monopolist has maximum market power, and a market share of 100%. A firm in a perfectly competitive market has no market power and its share is small enough as to make it irrelevant in determine the price. So market power must be related to market shares, although we cannot say if the

[14] See Judgement of the ECJ of 13 February 1979, Case 85/76, *Hoffmann-La Roche,* ECR [1979] p. 461, § 39.
[15] See Commission Notice on the relevant market, cited above., § 2.

relationship is linear or otherwise, what size the market share needs to be for market power to exist, and if there are other systematic factors. As the ECJ has wisely pointed out, *"A substantial market share as evidence of the existence of a dominant position is not a constant factor and its importance varies from market to market according to the structure of these markets, especially as far as production, supply and demand are concerned* "[16].

In practice, a high market share is a necessary, but not sufficient condition, to prove the existence of market power, and the Commission and the ECJ have gradually built a system of rebuttable presumptions: if a company holds a market share of 50%, it is presumed that it enjoys a dominant position, as it is likely that "the size factor" outweighs the other factors. Thus, it will bear the burden of proving that it is not dominant. On the other hand, a market share below 25% is generally considered as insufficient to prove a dominant position[17] and a market share lower than 10% indicates the absence of dominance[18]. Between 25% and 50% there is no presumption, and antitrust authorities should take in account additional factors besides market share. The presumption of market power can be strengthened by the stability of the shares over time, as companies that have high and stable market shares are more likely to enjoy market power than companies whose market shares fluctuate: the latter is what we would expect to see in a competitive market, where firms' fortunes change frequently.

Market shares can be calculated using both volume (number of units sold), and value (turnover)[19]. These methods can lead to different results for the same company[20]: in practice, value market shares are preferable as they reflect the price the company is able to get. In some cases, however, also volume market shares[21] or other criteria can be useful[22].

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[16] Judgement of the ECJ of 13 February 1979, Case 85/76, *Hoffmann-La Roche,* ECR [1979] p. *461,* § 40.

[17] See in this regard, Regulation No 139/2004 of 20 January 2004 on the control of concentrations between undertakings, in OJEC [2004] L 24 / 1, Recital 32.

[18] Judgement of 22 October 1986, Case 75/84, *Metro,* in ECR [1986] p. 3021, § 85.

[19] See Commission Notice on the relevant market, cited above, § 55.

[20] For example, if products are differentiated, the best known brand-name product can have a higher price: in this case, the market share of that company, in value, will be greater than that calculated according to sales volume.

[21] The European Commission has used this criterion, for example, *Procter & Gamble / Schickedanz,* Commission Decision of 21 June 1994, OJ [1994] L 354/32, § 118, when evaluating the parties' position in the market for products feminine hygiene.

[22] In special cases, the Commission has used the production capacity (see, for example, the case M.986, Decision of 11 February 1998, *Agfa Gevaert / DuPont,* in OJEC [1998] L 211/22, § 59) , the capacity of the fleet (in the air transport market), orders received in the markets in which companies generally work by contract, as the aviation industry and railways (see, for example, Case M.2220, Decision of 3 July 2001, *General Electric / Honeywell,* in OJEC [2004] L 48 / 1, § 38), advertising revenue for pay TV (see, for

3.3 Market structure

The market power of a firm is not independent of the market power of its competitors. In order to assess this, we need to consider both the size and the number of the competitors, as having one competitor with a 30% share will presumably be different from having ten competitors with a 3% share each. Consider the following example. In the market for a certain product there are 10 companies, each with a 10% share. If a company tried to cut production to raise the price, consumers would turn to the nine other companies, and the price increase would fail, because, in total, production would not fall. But if that company had the 80% of the market, its price increases could be more easily profitable, as the other firms would not be able to increase their production enough to compensate the decrease by the leading firm.

An effective way to account both for size and numerosity of competitors is to look at market concentration, using concentration ratios or the 'Herfindahl-Hirschman Index (HHI).

Concentration ratios measure the sum of market shares of the first *n* firms. For example, the index CR_2 measures the sum of market shares of the two largest companies, while CR_4 the sum of the top four. The latter is the concentration ratio more widely used in practice, although in many cases different ratios have been used. In practice, a market is defined as highly concentrated if its CR_4 is higher than 75%.

However, the use of concentration ratios has two significant weaknesses. First, they do not consider the relative size of the undertakings concerned: a market where the top four companies have a share of 20% each will have a CR_4 of 80%, like a market in which the first four companies have market shares of 55%, 20%, 4% and 1%. However, it is likely that competition will be less effective in the latter market. Secondly, concentration ratios do not consider the market shares of smaller companies: these may be important where these can quickly increase production, in response to a price increase by a larger rival.

Market share provides thus in practice a necessary condition for market power, although not a sufficient condition.

In some cases, antitrust authorities may seek directly to find a sufficient condition for assessing the existence of market power, by observing past behaviour: if the company being analysed was able to pass-on to customers an exogenous increase in input prices, and/or to increase - over a substantial period of time - its price relative to that of some *prima facie* substitutes, and/or to enjoy a profit rate (i.e. compared to capital invested) permanently

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example, case M.553, decision of 17 July 1996, *RTL / Veronica / Endemol ('HMG')*, § § 30 and 69).

above that of comparable firms, possibly in other geographical markets, and there are no other reasonable explanations for such stylised facts, then dominance may be inferred.

HHI is thus the preferred index, as it considers all firms, and is calculated by summing the squares of each firm's market share: if a company has a market share of 40% and the two other companies on the market have an equal share of 30%, the HHI is equal to $40^2 + 30^2 + 30^2 = 3{,}400$[23]. HHI can then vary from a minimum of 0 (in case of an atomistic market) to 10,000 (in the case of a monopoly).

The Commission has identified some significant thresholds for HHI index. For example, in the context of merger control, a market is defined as concentrated if the index is greater than 2,000, and is defined not concentrated if it is less than 1,000. Similar thresholds are applied in practice to cartels and abusive conduct.

It should be noted that, given the methodology for its calculation, HHI gives proportionately a greater weight to larger players in the market. Let's consider two markets. In the first there are four companies with a market share of 20% each, CR_4 equals 80%, and HHI is equal to $20^2 + 20^2 + 20^2 + 20^2 = 1{,}600$. In the second market – where market shares are respectively 55%, 20%, 4% and 1% - CR4 would still be equal 80%, but HHI would be more than twice as high, and equal to $55^2 + 20^2 + 4^2 + 1^2 = 3{,}442$.

Therefore, in practice, HHI is generally preferable to concentration ratios such as CR_4, as it can more accurately summarise the main features of market structure. However, when we do not have market share for all firms, we cannot calculate HHI, and have to use concentration ratios.

3.4 Other factors

In measuring market power, we need to take into account at least two other relevant factors.

The first is the existence of barriers to entry. Even when a company has a high market share, it may not enjoy market power, if there are no barriers to entry, i.e. if the market is contestable. In such case, if the company rises its prices, new firms would enter the market in a short time, attracted by the high profits, but of course such an increase in supply would reduce prices. In such a market, a high market share is not an index of market power.

[23] This index was used for the first time in the analysis of U.S. *antitrust merger guidelines* from 1992 and was later also implemented in the practice of the European Commission (see in this regard, most recently, *guidelines on the assessment of horizontal mergers,* 2004 / C 31/03, § 16).

But this is of course an extreme case. In practice, some degree of barriers to entry will be present in most cases. These arise from several factors:

- scale economies arising from technology: if I want to start producing engines for cars, for technological reasons I need to make a plant with a capacity in excess of 1 million engines per year. A smaller plant will not enjoy sufficient economies of scale, will have higher costs, and will lose money. A new entrant therefore faces an entry barrier. It cannot start with a small plant and later enlarge it: it needs to start with a large plant;
- scale economies deriving from other factors. In Ireland everybody drinks Guinness, but Guinness has an enormous number of ads on television. If a new company wants to promote its new beer, it will have to have a very large advertising budget, otherwise it's ads would be drowned by Guinness's ads. Thus, advertising can be an important entry barrier. Similarly, research and development costs can be an important entry barrier in some industries, such as chemicals or pharmaceuticals[24];
- special cost advantages, due to the location of the plant, allowing easy access to raw materials or final markets that new entrants cannot match.

The description I just gave shows how entry barriers may derive from strictly exogenous factors [e.g. technology], but may also derive from endogenous factors, as advertising[25].

A further important source of endogenous entry barriers is product differentiation. In a famous case involving cornflakes, it was shown how Kellogg's - the leading American brand - was producing an increasingly large range of slightly different cornflakes, in order to build a barrier to entry. If there were only normal cornflakes or All-Bran cornflakes, a competitor might enter the market offering 30% bran cornflakes. But if Kellogg's start selling 30% bran cornflakes, besides 0% and 100% bran cornflakes, entry will be more difficult.

In any case, there are very few markets in which that are no barriers to entry, but it is rare to have markets where barriers to entry are so high as to

[24] Scale economies give a very often rise also to financial barriers arising from the very large capital requirements needed to enter the market. Such an entry barrier may however arise also from other factors.

[25] The description follows the classical analysis of barriers to entry provided by Joe Bain in 1956. Further relevant analysis was provided by Stigler, who restricted the notion of entry barriers to cost advantages that an incumbent firm enjoys compared to entrants. The notion of endogenous barriers to entry has been developed by Sutton.

effectively prevent entry [most often this is the case when legal monopolies exist].

In practice, therefore, what matters is to analyze how difficult would be entry by competitors in the given relevant market, and how long they would need to enter. This is the substantial question to ask, and this is why we must analyze entry barriers when assessing market power.

A second factor that may limit the company ability to charge prices higher than their competitive level is the market power of buyers, or countervailing buying power[26]. Customers have market power vis-à-vis the supplier if they can credibly threaten to go elsewhere. Other things being equal, credibility will be higher when:

- the buyer would face low switching costs if it chose another supplier;
- the seller is very important to the buyer, e.g. when it provides components for a just-in-time industrial process;
- the supplier does not have a special know-how, which might be difficult to replace.

On the other hand, when network effects are relevant, buyer's power will be lower: Coca-Cola is very large, but if it stopped using Microsoft Office products it could have problems in transactions with its suppliers and customers. Network effects decrease the bargaining power of Coca-Cola vis-à-vis Microsoft.

Thus, buyer's market power can weaken the seller's market power, although it is infrequent that buyers' power is large enough as to curtail in a significant measure seller's market power.

[26] See, for example, the case M.42, Commission decision of 12 April 1991, Alcatel / Telettra (which was an emphasis on the counter of Telefonica, then only one buyer of telecommunications equipment in Spain, where both parties were present, the case M.527, decision of December 2, 1994, Thomson / Deutsche Aerospace AG (in which the state was the only buyer of products for the defense) Case M.580, decision of 18 October 1995, ABB / Daimler-Benz (in which the merger between two manufacturers of railway vehicles has been permitted, albeit with conditions, in view of the fact that the only buyer was Deutsche Bahn). See also the case M.938, Commission decision of 15 October 1997, *Guinness / Grand Metropolitan* (where the Commission took note of the existence of a significant *countervailing power* in the hands of the biggest buyers of the large-scale distribution), Case M.1225, Decision of 25 November 1998, *Enso /Stora*, in OJEC [1999] L 254 / 9 (when it was approved a merger between two operators in the European market for carton packaging liquid, would have a market share well over 50%, considering the fact that the market was the main buyer of Tetra Pak, which bought more than 60% of the overall market).

In antitrust practice, countervailing buying power is particularly important in merger control. It may also be relevant in assessing dominance in art. 102 TFEU proceedings.

Finally, other specific factors may generate market power such as availability of superior technologies, a high vertical integration (which may occur, for example, if an important manufacturer also has an extensive commercial network), the reputation that a company has achieved (for example, through systematic and costly promotional and advertising campaigns), or ownership of intellectual property rights such as trademarks and patents.

4 Horizontal agreements

Firms may collude within a given relevant market, reaching what are called in legal terms "horizontal agreements" or in economic terms "cartels".

As we saw above, collusive agreements are inherently unstable, as any participant has a rational reason for entering into the agreement first, and betraying the agreement later: in doing so, it hopes to be able to conquer market shares from the other participants to the agreement.

On the other hand, agreements are very common, and every year the European Commission inflicts fines for hundreds of millions of euro to companies that have entered into horizontal agreements. So either our theory is wrong, are there are situations in which cartels can indeed be stable. Let us have a look.

4.1 Structural factors and cartel creation

Collusion is facilitated by certain characteristics of the market, or of the production process.

Barriers to entry are usually a necessary condition for an effective cartel. If some firms agree to cut production in order to raise prices and market entry is easy, new firms would enter attracted by the high prices, and this of course would reduce prices and undermine the agreement.

A second important feature is a high market concentration. If a few firms have a high combined market share, they can more easily coordinate and control each other (to discover whether there are price or quantity policies different from those decided) and thus impose a high price on the market.

The existence of structural links, direct or indirect, among firms may also facilitate cartels. There are many kind of links: cross shareholdings, joint control of other companies, or interlocking directorships (representatives of a company sits on the board of directors of another).

Firms characteristics can also be relevant.

Companies of similar size or having comparable production and cost structures will find it easier to collude, since each of them will be able to detect each other’s behavior quite easily.

In addition, if a firm has a marginal cost much lower than the cartel price, the incentive to cheat is greater: if the price is set at € 100, and the cost of producing an additional unit is equal to € 10, the decision to cheat the cartel

will provide a profit of € 90. But if the marginal cost is € 85, cheating will only bring € 15[27].

Collusion can also be facilitated by the characteristics of market demand. If it is stable or grows slowly, the cartel will find less difficult to agree on production quotas for each. If demand is rigid with respect to price, it will be easier to impose a price increase. Also, if customers are numerous, and therefore buyers' concentration is much lower than sellers' concentration, sellers will find less resistance against price increases. On the contrary, a very elastic demand can produce opposite effects: on the one hand, it increases the incentive for companies to lower prices and thus to deviate from the cartel, and on the other hand, it makes likelier remarkable punishments consisting of significant price reductions.

Of course, also demand predictability is important: if transactions are frequent, concern homogeneous products, which are sold in relatively constant quantities, it will be easier for a firm to know the prices of the other firms.

Structural factors above described can facilitate collusive behavior. However, as we have seen, agreements are unstable: thus, there is no mechanical relationship between these factors and the actual existence of cartels. In other words, the presence of one or more of these factors simply makes it more likely the organization of a cartel and its duration over time.

4.2 How to make cartels stable

But are cartels as unstable as our simple model in Chapter 1 would imply?

The model we used to show that collusion is unstable is too simple, as it assumes that cheating is very easy: the other firm is not aware that the cartel agreement is being broken, and it cannot do anything to discourage cheating. We also considered the choices of firms in a static framework, i.e. considering a case in which only one decision has to be taken.

In fact, firms compete day after day in the market, know each other, and remember each other's behavior: competitors interact repeatedly. So, if a firm cheats on a cartel agreement today, it must consider the risk that the other members will punish it for cheating in the future. A cheating behavior - for example, the offer of lower prices or the sale of higher quantities than those set by the cartel – can be typically punished by the other cartel members by a coordinated reduction in prices, through a coordinated

[27] This helps to explain why OPEC is often troubled: the marginal cost of extracting a barrel that can be sold on international markets for $ 50 is not much higher than $ 10 in many of its members.

increase in quantities. In doing so, they would sacrifice some of the extra profits that they would have earned sticking to the cartel price, and 'tolerating' deviant behavior: this sacrifice, however, may be a reasonable price to pay in order to restore the cartel rules, calling the cheating company to order, and enjoy higher prices.

The possibility of imposing an effective punishment depends on several factors. Companies must first be able to ascertain quickly the existence of a cheating, so that accurate and timely information on the behavior of others (we will deal with this aspect in the next paragraph) are necessary. In addition, firms must have a sufficient level of spare capacity to increase production significantly. Finally, the production increase must be large enough to reduce prices, and this may occur more easily when customers consider the products of the cartel members as homogeneous. Homogeneous products, information about other firms' behavoiur and spare capacity, then, are the three main variables that allow an effective punishment of cheating firms.

Of course, in order to punish cheating, we need to catch the cheater: thus, information is vital for cartels. Since each participant has a rational incentive to deviate from the agreement, it is essential, for each cartel member, to have information on quantities produced and prices charged by each of the other participants. Only in this case a cartel member can assess if an unexpected decline in its sales depends on the economic cycle or on the deviation of one of the other participants. For this reason, antitrust action against the information exchange among competitors is particularly vigorous, and prohibits the exchange of information of a confidential and strategic nature. These are, for example, data on quantities produced, prices, discounts and terms of sale, as their communication can lead competitors to change their behavior on the market. However, data which are not recent or relate to an aggregate of firms are not critical.

If data are not privately exchanged among competitors, but are made public, there may be contrasting effects. On the one hand, if consumers have detailed information about price and market conditions, there can be a positive effects on competition. Transparency may increase the elasticity of demand, lower prices and make the cartels less stable, because it increases the incentive to deviate from the common policy of the cartel. However, it may also deter potential deviations from the agreements, since it makes easier for the participants to punish the cheating company, lowering their price[28].

[28] The controversial effects of transparency on the stability of the cartels are illustrated in a particularly clear way in a recent decision of the Authority (see decision of 30 September 2004, *Ras-Generali/Iama Consulting*, in Bulletin No. 40/2004, § 166, then canceled by the Lazio Regional Administrative Court on April 28, 2005).

Another behavior that may facilitate collusion is the adoption of contractual clauses that encourage competitors to behave similarly, make the market more "transparent", thus making easier for each company to understand competitors' behavior.

They include *English clauses* (requiring the buyer to inform the seller about any better offer it may receive. If the seller matches this offer the buyer will be obliged to accept it) or *Most Favoured Client clauses* (requiring the supplier to grant the same discounts that its competitors are willing to grant to the buyer; thus the supplier has to assure the lowest price on the market). These provisions encourage uniformity of prices and discounts: in the first case, competitors will not tend to grant favorable terms, as they are aware that this is not enough to steal the customer from a competitor; in the second case, suppliers will tend not to grant favorable terms, otherwise they would be obliged to offer them to everyone. In addition, these clauses induce customers to acquire information about market prices and to communicate them to their suppliers, thus facilitating the detection of any deviant behavior. Other clauses may be relevant in specific sectors[29].

4.3 'Tacit collusion'

So, cartels may be formed, and an antitrust policy against cartels is certainly necessary.

But how exactly do we define a cartel? Companies in oligopoly will always find some sort of equilibrium: as we saw, each of them will take into account its competitors reactions whenever it takes a decision, e.g. regarding prices for a new product. As companies interact time after time, even if they do not create a cartel, they will certainly reach a sort of *modus vivendi*, and prices will not change much over time, unless demand changes or input prices change. Sometimes this is called "tacit collusion". Should the anti-trust law prohibit this? If it did, it would be unreasonable, as on the one hand companies cannot be forced to compete, and on the other, as the European court of justice has clarified, "each economic operator must determine independently the policy which he intends to adopt on the common market … Although it is correct to say that this requirement of independence does not deprive economic operators of the right to adapt themselves intelligently to the existing and anticipated conduct of their competitors, it does however strictly preclude any direct or indirect contact between such operators, the object or effect whereof is either to influence

[29] A classic example is the terms of *basic point pricing*, markets historically common in steel, automobiles, cement and sugar, with which the transport costs is determined by reference to a single point, regardless of its place of effective delivery of goods. In this way, the price component on the transport becomes more homogeneous and transparent.

the conduct on the market of an actual or potential competitor or to disclose to such a competitor the course of conduct which they themselves have decided to adopt or contemplate adopting on the market." [30]

The border between collusion and intelligent adaptation to competitors' expected behaviour which has been traced by the Court is a reasonable one from economic point of view. We will never be able to decide if companies whose prices are very similar and move in a similar way are part of an illegal collusive agreement, or are just reacting intelligently to market conditions and to each other's behaviour, and have found a licit equilibrium.

Thus, public policy has chosen a prudent approach, attributing a very high importance exactly to the factor that we saw is fundamental for cartel stability: exchanges of information. If information exchanges are actively discouraged by anti-trust policy, cartels will be more unstable. Of course, such a prudent standard will result in more cartels being able to escape detection. On the other hand, if we adopted a stricter standard we would certainly be prosecuting, at least in some cases, purely rational behaviour by the companies involved. It is certainly inefficient to discourage rational behaviour by firms.

On the other hand, over time, a second criterion has been adopted by the European court: if two or more companies exhibit a parallel behaviour, which cannot be justified rationally from an economic point of view, then it must be concluded that they are engaging in collusive behaviour.

This is a less-prudent legal rule, but again it sounds reasonable from an economic point of view, audit basically provides companies to compete against each other, as long as it is a rational to do so.

However, as we saw in the introductory chapter, an oligopoly that reaches out some form of tacit collusion will have higher prices and lower quantities then if it failed to reach such an equilibrium, and companies kept competing vigourously. This is why, in merger control, as we will see below, we try to account for the fact that the merger may encourage the firms to reach some sort of the tacit collusion equilibrium. We shall discuss this below.

4.4 Costs and benefits of participation in a cartel

From a purely economic point of view, "colluding" or "competing" is a rational decision.

[30] Judgement of the ECJ of 16 December 1975, Joined Cases 40 to 48, 50, 54 to 56, 111, 113 and 114/73 *Coöperatieve Vereniging Suiker Unie UA and others v Commission*, in ECR [1975] p. 1663, § § 173-4.

The expected benefits are equal to the extra-profits that the company will get thanks to the cartel, cumulated over the number of years in which the cartel can be reasonably expected to be operating.

The expected cost is made up of two main components: (i) the costs of organizing and maintaining the cartel and (ii) the expected punishment, if the agreement is detected and punished by the antitrust authorities. The latter component clearly depends on two factors, i.e. the probability that the cartel is discovered and the total amount of the fine.

This cost, in turn, depends on the fine, plus reputational damages the company may suffer, and civil damages.

The expected cost of a cartel will therefore depend on the antitrust law, and how vigorously it is enforced. In Europe, antitrust offenses are punishable with administrative sanctions essentially, damage proceedings against cartel members still are quite rare. In the United States, on the contrary, actions for damages filed by competitors and customers can generate higher costs than administrative fines imposed by antitrust authorities. Many offenses can also entail treble damages, and class actions (that enable competitors and consumers to join their claims – holding down costs – in a single high-value lawsuit) are common. In the United States criminal sanctions against managers involved in cartels are also very common.

In conclusion, the expected cost of a cartel is much higher in the United States than in Europe, although the progressive increase in Europe of antitrust damages actions could lead to a reduction of this difference between the two systems.

5 Vertical agreements

The assumption that horizontal agreements among competitors may have negative effects on competition is certainly reasonable, as it is reasonable the opposite assumption with reference to vertical agreements, ie. the agreements among companies that work at different levels of a production chain: in most cases, the efficiencies deriving from vertical agreements largely offset their possible negative effects.

Two companies that compete in the same market and offer substitutable products may have a rational incentive, as we have seen, to agree to raise the price. On the contrary, a manufacturer and a distributor offer complementary products (or services): thus, if the distributor (or the producer) rises its selling price, consumers will reduce their purchases, and this would also reduce producer's (or distributor's) sales. In conclusion, producers and distributors have a rational incentive to avoid that the other one raises its prices, rather than to collude to raise them.

Conflicting interests between parties may be very significant in vertical agreements, which typically include several clauses to manage them. Typically, those includes: clauses on selling prices and quantities, sales and after-sales services, geographic or product exclusive provisions, and others. These clauses usually govern the parties' conflicting interests and usually have no anticompetitive effects.

For this reason, from a strictly economic point of view, vertical distribution agreements should be relevant from an antitrust point of view only in two main cases: when they foster collusion among competitors in the upstream or downstream market (but, as we shall see this is an horizontal agreements problem), or when they enable a firm with market power to foreclose its competitors (and this is an abusive conduct problem).

Let us see how vertical agreements may solve two basic economic problems in a producer/distributor relationship: double mark-up, and externalities.

Let's suppose that a pharmaceutical company sells its patented drug through a pharmacy that enjoys a significant market power in a given area. If the drug price is freely set by the company, it will apply the rule of monopoly price, choosing the quantity to be produced in the light of its cost and marginal revenue, and charging the highest price that the market will bear. If the pharmacy has a monopoly in its area, it will apply the same rule, starting from a marginal cost that includes the drug purchasing cost. The final retail price of the drug will thus be very high, as it includes two monopoly profits, both the manufacturer's and the distributor's mark-ups. This will reduce consumers' demand, so the producer will not maximize its profit.

Therefore, the pharmaceutical company will impose on the pharmacy a maximum retail price for the drug, in order to sell the quantity of drug that actually maximizes its profits. This decision will not harm consumers, but rather benefit them. Thus this is a vertical restraint that does not pose particular antitrust problems.

Let us consider the externalities problem. Producer / distributor contracts are a typical example of what economics calls a principal-agent problem: the principal appoints the agent to act on its behalf, as the principal is not willing or able to carry out a certain activity on its own. This is a frequent type of contract. However, it presents interesting problems as, typically, (i) the agent's goals are different from those of the principal (for example, the latter wants the product to be sold at a low price to increase sales, while the distributor - having market power in a certain area - would like to sell less, but at a higher price), and (ii) the information available to the agent (eg on market conditions) are much more extensive and detailed than those available to the principal. To avoid the first problem, the principal typically tries to monitor strictly the agent's activity, but the second problem makes it difficult to carry out this monitoring.

Let's consider, for example, the activity of product promotion under a distribution agreement. The manufacturer will make a certain advertising investment, but it will ask distributors to promote the product in local market, for example by advertising in the local press, placing the product in the most visible point of the shop, or offering additional services to customers. These activities have of course a cost to the distributor, who might be tempted not to comply fully with these contractual obligations. As it will be expensive for the manufacturer to verify any breaches of such clauses, it will try to generate rational incentives for the distributor to act as the manufacturer would like him to do.

The obvious incentive is profit and therefore the manufacturer will offer incentive such as discounts related to the achievement of specific sales volume. These incentives may not be enough to discourage opportunistic behaviors. For example, with a typical free-rider action, the distributor may decide to save money on promotion costs - that it should bear under the contract - counting on the effects of the advertising campaigns that the producer runs nationwide, and upon other distributors' promotional efforts (e.g. advertising in neighbouring areas). He would be enjoying the externalities.

Other incentives may give an exclusive right to the distributor in terms of the territory or customers it is allowed to serve, or fix a minimum sales volume.

This kind of clauses undoubtedly limit intrabrand competition, i.e. competition between different distributors of the same brand, but they

usually increase inter-brand competition, i.e. competition between different brands: if a manufacturer is able to use successfully such restrictions to limit distributors' free riding, they will strongly promote their product and therefore competition among brands will increase. It is therefore difficult to argue that these vertical clauses reduce consumer welfare. Thus they usually do not pose particular antitrust problems.

The scenario is much different if the vertical restriction consists in fixing a minimum selling price, often called resale price maintenance. Although there may be reasonable grounds for such a clause (for example preventing damages to the product brand if the price is too low), and although it is reasonable to argue that a minimum price is another tool to discourage distributors' free-rider behavior, both in Europe and the United States this kind of clause is generally prohibited, as it may restrict inter-brand competition and thus harm consumers. In addition, if the manufacturer sets a minimum price, a collusion *among distributors* will be more likely*:* the latter are numerous and territorially dispersed so they would have trouble to engage in an horizontal agreement, that instead may indirectly be fostered by a minimum price set by the manufacturer.

On the other hand, maximum prices or reference prices setting is allowed, provided it does not limit the ability of distributors to grant discounts.

6 Dominance and abusive conduct

6.1 The concept of dominance

A dominant position is traditionally defined in the E.U. as *"a position of economic strengths enjoyed by an undertaking which enables it to prevent effective competition being maintained on the relevant market by giving it the power to behave to an appreciable extent independently of its competitors, customers and ultimately of its consumers.* "[31]

This definition raises some doubts, if interpreted literally, as no company is totally independent from its customers: even a monopolist will sell lower quantities if it raises its prices. In addition, only a monopolist can behave independently of its competitors (as it has none), and oligopolists obviously interact. Moreover, the other element set out by the ECJ - the ability *"to prevent effective competition"* - is of doubtful utility, as it is not clear how this capacity can be verified.

However, as we saw in Chapter 3, market power can be assessed on the basis of a firm's market share, those of its competitors, the analysis of entry barriers and customers' countervailing power, and other factors. If we interpret more broadly the Court's definition it is indeed sensible. Literally, it can be applied only to a monopolist, but in practice it captures the characteristics of any dominant firm.

So, let us assume that a company is identified as dominant: when may its conduct be abusive on the basis of article 102 TFEU? The text of the article is not very helpful, as it contains a (purely) indicative list[32].

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[31] ECJ Judgement of 14 February 1978 in Case 27/76 *United Brands* in ECR [1978] page 207, § 65. A dominant position is usually held by one company (one-sided dominance); very rarely, it may be held by two or more undertakings (collective or joint dominance). The latter situation may occur when several companies, although legally and economically independent, present themselves or act on a given relevant market as a single entity.

[32] Article 102 TFEU: "Any abuse by one or more undertakings of a dominant position within the internal market or in a substantial part of it shall be prohibited as incompatible with the internal market in so far as it may affect trade between Member States. Such abuse may, in particular, consist in:
(a) directly or indirectly imposing unfair purchase or selling prices or other unfair trading conditions;
(b) limiting production, markets or technical development to the prejudice of consumers;
(c) applying dissimilar conditions to equivalent transactions with other trading parties, thereby placing them at a competitive disadvantage;
(d) making the conclusion of contracts subject to acceptance by the other parties of supplementary obligations which, by their nature or according to commercial usage, have no connection with the subject of such contracts."

The European Court of justice has somewhat clarified the issue by stating that the dominant company has a "special responsibility", but such a responsibility cannot be defined in general. From an economic point of view, several criteria have been proposed. We don't have time to discuss them here, but generally speaking it is useful to keep in mind that a behavior that would be irrational if it did not have the effect to eliminate one or more competitors would generally be considered to be abusive. The problem of course is how can we assess if a given behavior has such a characteristic, without waiting for the competitor to die. In practice, courts in some cases adopt a *per se* rule, whereby a given behavior from a dominant company is always forbidden [such as the adoption of English clauses or retroactive discounts: see below], and in some other cases adopt a rule of reason, trying to ascertain the practical effects of a behavior that may, or may not, be abusive.

It is useful to distinguish between two types of abusive conduct: actions that have a direct effect on consumers (exploitative abuses), and those that have an indirect effect on consumers, as the exclude competitors from the market (exclusionary abuses). The latter may be further distinguished in two groups: non-pricing-based and pricing-based abuses, as competitors may be excluded (or foreclosed) using aggressive pricing policies or by other means.

6.2 Exploitative Abuses

Considering that a dominant firm will always try to raise prices above costs, we could conclude that excessive pricing cases should be relatively frequent. This is not the case, for two reasons. It is not easy to find a suitable test to apply in practice the general formulation of art. 102 TFEU which prohibits *"unfair"* prices. On the other hand, prices can be much higher than costs for several reasons, that cannot constitute an abuse.

In theory, fairness may be ascertained by comparing price with cost (including a reasonable profit margin), but cost estimation may be extremely complex. Accounting theory does not offer a single best way to calculate costs: there are several methods, and their results can be very different, especially when a multi-product firm uses the same inputs to produce different products. Finally, also defining what constitutes a reasonable profit margin is rather difficult: typically, margins vary widely across sectors, and over time.

Again, on theoretical grounds, we could verify the existence of unfair prices by analyzing the dominant firm’s profitability and inferring the existence of excessive prices if it is permanently higher than average market

profitability. But even this solution is not simply applicable: first, dominant firms are often multi-product and in these cases establishing a connection between profitability and a specific product price is not easy; second, profitability is cyclical, and often varies from sector to sector; third, higher rates of return may reflect the existence of a "risk premium", that a company obtains legitimately by the market as a reward for the risky investments it has made Moreover, if the company has invested to develop either patentable inventions or highly appreciated brands, profitability will be high, but only because the profit includes the remuneration of the patent or of the brand.

Empirically, we may think to assess prices fairness referring to some "market prices", e.g. carrying out a comparison among prices across national markets (this was the approach taken by the Commission in the *United Brands* case[33]). In practice, this method is unreliable as economic conditions such as transport and distribution costs, or consumer demand, can vary greatly across markets. In any case, the ECJ has ruled in that case that prices can only be appreciated by referring to costs.

It is therefore not surprising that the Commission itself has concluded as *"In proceedings against abuse consisting of charging excessively high prices, it is difficult to tell whether in any given case an abusive price has been set for there is no objective way of establishing exactly what price covers costs plus a reasonable profit margin."*[34]

6.3 Non-pricing-based exclusionary behavior

A dominant firm can try preventing entry of new competitors, or forcing out existing competitors (both strategies are called foreclosure), through two main types of behavior: refusal to supply, particularly in cases where their input is essential (in some sense: see below), and / or adopting various forms of tying, which induce purchasers of good A, to buy also good B.

However, a refusal to supply may be justified by the need to recover investments made in the past, and tying makes often customers happy and it is often difficult to argue that it damages welfare. Therefore, the analysis of a dominant firm's conduct often requires an analysis of its economic effects.

[33] ECJ Judgement of 14 February 1978 in Case 27/76 *United Brands* in ECR [1978].
[34] European Commission *Report on Competition Policy V*, § 3.

6.3.1 Refusal to supply

An unreasonable refusal to supply by a dominant company may constitute an abuse if it drives a competitor out of the market, or prevents it from entering the market[35].

The refusal must be unreasonable, e.g. it is perfectly legitimate to refuse supplying a competitor which has unpaid bills, or because the dominant company stops producing altogether the product. *Prima facie* it will be easier to prove unreasonableness for a refusal to supply a good that was supplied in the past.

The refusal must also be exclusionary, i.e. the competitor must find it impossible, extremely difficult, and/or extremely expensive, to purchase the product elsewhere.

6.3.2 Refusal to supply an essential facility

The good sold by the dominant company is generally useful to competitor. But how can we decide when it is really essential?

These problems are particularly relevant when we consider networks, as a refusal to access a network can indeed foreclose competitors. On the other hand, opening networks to competition has been, from the 1980s, such an important policy objective in Europe, that the Commission and the Courts have gradually developed an (imperfect) essential facilities doctrine[36], whereby a company that operates a facility - the use of which is essential to compete in downstream markets e.g. ports, airports or telecommunications networks - cannot refuse access to it under fair and non-discriminatory conditions to its competitors, without an objective justification.

The "doctrine" seeks to strike a balance, under public policy consideration, between the opposite interests of the network owner, and the company seeking access. Infrastructures are developed by companies through risky investments. Mandating access to competitors is an obvious interference with the owner's property rights and could discourage new infrastructures construction or the upgrading and maintenance of the existing infrastructure. The infrastructure owner would not take full advantage of investments made, as it would be obliged to share these benefits with competitors who have not sustained the same risks and financial burdens. Furthermore, if

[35] Besides an outright refusal, also a constructive refusal may be abusive, e.g. when the dominant firm sets unacceptable commercial terms to the purchaser.

[36] The essential facility doctrine was applied for the first time in the early 90s with reference to a port infrastructure in the case of *Sea Containers / Stena Sealink*. Unlike the Commission and the Antitrust Authority, however, the ECJ has never explicitly referred to the *essential facilities* doctrine, although some of its rulings seem to apply it implicitly.

mandatory access is easily obtained, no competitor would develop its own infrastructure, as it could access someone else's infrastructure without incurring the corresponding developing risks and costs.

Thus, an indiscriminate access obligation, would increase competition in the downstream market in the short term, but would reduce it in the long run: only a specific analysis of the necessary conditions to apply the *essential facilities* doctrine can balance these conflicting needs.

In order to apply the doctrine, it is necessary, first, to ascertain that the infrastructure is a relevant market in the antitrust sense. It is reasonable to say that there is a market for the provision of (say) electricity transport services, which is separate from the provision of electricity to users (to see this, remember the SSNIP test). Thus, electricity transport is a relevant market, and the company that owns the transport infrastructure is dominant and cannot refuse access. The sale of books on the Internet, on the other hand, is probably not a relevant market (again, use the SSNIP), but a part of the overall book market. If it is so, then Amazon is not dominant, and can refuse access.

Next, it is necessary to check that the infrastructure is really essential in order to operate in the downstream markets (such as electricity transport in electricity supply). In order to distinguish cases where the infrastructure use would be convenient to the competitor [this happens of course very often] from cases where it would be truly essential, it would not be correct to refer to the competitor point of view: all new entrants are small, and infrastructure owners are very large. Thus, from the point of view of the competitor, it would be easy to show that its costs would be enormously higher than the costs of infrastructure owner if it had to build the facility. This would lead to generalized obligations to supply for infrastructure owners, and to a corresponding decrease of their propensity to invest in the infrastructure, as these would become less profitable.

In order to find some equilibrium between the conflicting economic interests, courts usually evaluate essentiality by referring to an hypothetical competitor having the size and the characteristics of the infrastructure's owner. In this way, the assessment of essentiality becomes objective. In practice, in order to prove essentiality it must be shown that duplication of infrastructure would not be economically viable even for a competitor of similar size as the owner of the existing infrastructure.

6.3.3 Intellectual property as an essential facility

Intellectual property rights confer a legal monopoly. Can this be seen as an essential facility and generate an obligation to supply?

Case law has proceeded here from ruling out the possibility of applying the principles governing refusal to supply to IPR, to recognizing that some ways of exercising intellectual property rights might constitute an abusive behavior.

Subsequent developments in case law have also substantially extended the applicability of the essential facility doctrine: the substantial rule is that "access" to an essential intellectual property right is granted only when the refusal on market A (that where the IPR owner enjoys a monopoly): (i) prevents the creation in market B of a new product for which there is an actual or potential demand, (ii) is not justified by objective considerations and (iii) entails the complete elimination of competition in the market for B[37].

6.3.4 Tying and bundling

Very often goods are sold together: shoes and shoe-laces, a new car and its tyres, and so on. When a company which is dominant in the market for good A does this, there is however the risk that it may be seeking to "transfer" to B its dominant position in the market for A.

In order to see when this might be the case, we must distinguish three different cases, in which the dominant company embarks in:

- (i) *strictu sensu* tying, or the sale of product B (the tied product) only to customers who also buy product A (the tying product), which can however, be purchased independently of B (e.g. shoes and laces);
- (ii) bundling, or the sale of A and B always together (they cannot be bought separately, such as left and right shoes), and
- (iii) mixed bundling, in which the buyer can buy only A, only B or both A and B, but in the latter case the price of A + B is less than the sum of the prices of the two products individually (e.g. coke and sandwich, in many cafés).

All these strategies may have valid justifications. Indeed, tying can be efficient: if strings were not sold along with shoes, tires along with new cars (two classic cases of tying), or left shoes with right shoes (an obvious case of bundling) buyers should purchase the two products separately, incurring significant transaction costs.

In other cases, tying can aim to increase the value of the good for the buyer:

[37] ECJ Judgment of 6 April 1995 in Joined Cases C-241/91 P and C-242/91 P, *RTE and ITP v. Commission*, in ECR [1995], p. 743. See also *IMS Health v. NDC Health*, ECJ Judgment of 29 April 2004, case C-418/01, in *Racc.* (2004), pp. I-5039.

a photo printer is usually sold along with the ink cartridges and photo paper that allow immediate use (this is of course still a case of tying); a sophisticated computer is sold only together with an operating system (this is bundling), which optimizes its operation. Tying, especially in the form of mixed bundling, then can increase sales with a positive effect on consumer welfare.

In some cases, bundling may have an anti-competitive motivation. The number of these cases, however, is more limited than we might expect, because the profit on the sale of the bundle can be higher than the profit on the sale on one of the goods only if the firm has market power for both products.

This conclusion is an interesting point of the Chicago school and may be explained intuitively as follows. Let's suppose that a firm is monopolist for product B, that is sold at a profit-maximizing price of € 100; the company now enters product A market, and decides to sell both product only in a bundle. Product A market is perfectly competitive and its price is € 1. If the bundle is sold at € 110, since there are many sellers who will continue to sell product A at its competitive price of € 1, consumers that will buy the bundle at € 110 are only those who would have bought B even at the high price of € 110 - € 1 = € 109. But this price does not maximize the monopolist's profits, which, as we said, are maximized at the price of € 100. Repeating this reasoning for all possible prices, we can conclude that the only bundle price that maximizes profits is € 101 and that therefore there is no extra profit from a bundled sale: in Bork's words (1978) *"there is only one monopoly profit to be made."*[38] Thus, the profit on the sale of the bundle may be higher than the profit on the sale of two single products only if the firm has market power for both products, so as not to have competitors who sell at lower prices on any of the two markets. There is no risk of transferring the firm's dominance from B to A.

This result, however, is true only in a static context, as it is evident considering Microsoft bundling strategies. One of the historical characteristic of this company's business strategy has been to provide application programs bundled with Windows operating system. The constancy of this strategic choice probably does not depend so much on short-term profit considerations (such as those involved in the above example) but on dynamic considerations.

[38] Bork, R. (1978), *The Antitrust Paradox: A Policy at War with Itself*, Basic Books, New York.

6.4 Pricing-based exclusionary behavior

6.4.1 Predatory pricing

Predatory behavior is two-step strategy put in place by a dominant company. In the first phase, it lowers prices to force its competitors out of the market. In the second, it raises prices at monopoly level, recovering any losses suffered in the first phase, and enjoying - from then on - monopoly profits.

Of course, it is not so easy to pursue a similar strategy. In the first phase, in order to force its rivals to exit the market, the company must reduce prices below average cost, and suffer losses which will be higher than those of its competitors: in order to decrease prices, it has to increase production substantially, and as its rivals will reduce or cease production (in order to lose less money), otherwise prices will increase. Thus, the predator will bear, in the first phase, very high losses. Thus, in practice, a predatory strategy may succeed only if dominant firm's costs are significantly lower than those of its competitors, as this will make initial losses lower, and if it has 'deep pockets', i.e. is rich enough to bear these losses. In any case, the market will need to be protected by entry barriers so that rivals that exit during the first phase, when prices fall, will not be able to re-enter during the second phase, when prices raise.

Of course, a dominant undertaking may have many legitimate reasons to cut prices: it may be reacting to competitors' discounts, stimulate demand, dispose of excess inventory, and so on. In order to identify the price reductions that may actually affect competition through predation, it is therefore often necessary to carry out an economic analysis.

The most common test (called the Areeda–Turner test) is based on elementary microeconomics, according to which a company will continue to produce even if it records a negative profit, until it is able to cover its variable costs[39]: as long as it is able to pay for the raw materials and labor necessary to produce an additional unit of product, it will remain active, hoping that a price increase will increase its profit margins. Only when prices fall below variable costs, it will be forced to cease production and exit the market. Therefore, a dominant firm will rationally continue to produce - if it is not able to cover its variable costs – only if it expects that it wil be able to raise significantly prices in the future, i.e. able to carry out a successful predation strategy. Therefore, prices below variable cost are usually considered a sufficient condition to show the existence of predatory behavior.

[39] Variable costs are those cost items that vary with the volume of production, typically related to labor and raw materials.

The Areeda-Turner test thus provides a 'floor' for a dominant company's prices. The ECJ has however added a further criterion: if prices are below average total costs - which include both variable and fixed costs – and above variable costs, the conduct may be considered as predatory if other elements show the existence of a broader strategy aimed at eliminating competition. In practice, only selling at prices above average total costs a dominant undertaking may be substantially protected from allegations of predatory politics.

The Areeda-Turner test is useful. However, it may be inaccurate for two main reasons.

First, many dominant firms are multi-product and, as we have seen, it may be difficult to assess accurately, in such cases, the costs related to a specific product.

Secondly, decisions to cease production of a particular item are taken by firms considering a wide range of variables, and not only costs and revenues related to the product. Thus, a company may continue the production of a certain good even if it fails to cover its variable costs, because it considers that it is important to have that item in its portfolio in order to maintain its presence in a particular customers' segment; to maintain a specific know-how in a sector that is likely to develop in the future; to keep open plants that may be easily converted to other productions in the future, and so on. In any case, in the real world, often companies do not decide to exit a market considering only short-run costs.

In any case, since the choice to embark on a predatory strategy produces an immediate cost to the firm (a loss), against a future uncertain profits stream, a decision to predate is essentially very similar to an investment decision, and it should be assessed by comparing the costs of an alleged predatory behavior to the present value of its future benefits.

6.4.2 Price Discrimination

Price discrimination in practice occurs when a company sells an identical good to different buyers at different prices, for reasons unrelated with production and delivery costs. If discrimination is carried out by a dominant company, it may be illegal. But when exactly is discrimination an antitrust offence? Let us see first when price discrimination may occur.

A dominant firm can discriminate among its customers only if it is able to accurately assess the willingness to pay of each customer or customer groups. In addition, it must be able to prevent arbitrage, which takes place when consumers who pay a lower price for a good resell it to consumers who are asked to pay a higher price.. Arbitration may be made impossible by the nature of the product or service, hampered by high transport or

transaction costs, or may be prevented or made difficult by special contract clauses that prohibit or invalidate the guarantee provided by the manufacturer in case of re-selling.

Discrimination may take different forms: differences in official prices (air fares may vary depending on the number of days between departure and return dates), discounts according to quantitative (purchasing volume) or qualitative factors (e.g. student tickets), the award of prizes in cash or in kind (which is economically equivalent to discounts), the application of non-linear prices (e.g. the price embodies a fixed part and a variable part, that is proportional to the number of units actually purchased, such as for electricity or fixed phone lines), and many others.

In practice there are two main types of price discrimination which are relevant to our discussion:

- firms may charge different prices to consumers having different characteristics (e.g. students);
- the company has enough information to segment customers into groups, and to offer to each of them a different pricing plan: for example, tourists who are able to plan in advance their trip may pay lower prices than business travelers that are willing to pay higher prices to ensure flexible departure and arrival times (so called "time sensitive" passengers). Note that in this case the firm does not need to have information about each customer's characteristics: consumers self-select, by assigning themselves to each pricing plan.

Price discrimination may be an antitrust offence only if it entails an exploitative or an exclusionary abuse. As we discussed above, exploitative abuses are very difficult to prove in the simple case of excessive prices, and thus they are even more difficult in price discrimination cases. In practice, exploitative abuses cannot be proved in these cases. This is not a great loss from an economic point of view, as it is in general unclear whether discrimination has positive or negative effects on welfare[40].

Furthermore, in network infrastructures, such as energy, transport or telecommunications, imposing higher prices to the customers which require access to the network during periods of its highest use is in general socially efficient. The network must have adequate capacity to meet demand at peak periods, and by such a "peak-load pricing", depreciation and investment costs for capacity needed at peak are paid by those who actually require it.

[40] For example, volume-discounts may increase demand, and production. In general, an increase of production will increase welfare, and thus these discounts may be positive. Cheap tickets for students are made possible by expensive tickets to professors, and so on.

On the other hand, price discrimination may be exclusionary, and this is indeed the line taken by art. 102, paragraph (c), which prohibits price discrimination only if it puts some of the dominant company's customers at a "competitive disadvantage" vis-à-vis other customers (this is called in the U.S. secondary-line price discrimination). Thus, price discrimination should be considered abusive only if (i) performed towards customers who are in competition with each other, and (ii) it is so severe as to have a material effect upon the competitive position of the customers involved.

However, competition authorities have often prohibited price discrimination, regardless of the actual existence of a competitive disadvantage in the downstream market, unless the dominant company can prove that there is some "objective" reason (typically, differences in cost)[41]. Thus, price discrimination is one of the areas in antitrust where there is a large difference of opinions between legal and economic thinking.

6.4.3 Loyalty-inducing discounts

Discounts are a form of price discrimination, which may result in either a distortion in competition among customers (discussed above) or in exclusionary effects towards competitors.

Exclusionary effects may be generated by discounts that are specifically engineered to dissuade customers from replacing the dominant firm with one of its competitors. On the other hand, discounts that reflect a saving obtained by the dominant firm because of the characteristics of the order received are not considered abusive: for example, a very large order that generate cost savings can certainly be accorded a discount.

The main types of discounts that are particularly likely to be considered illegal are: (a) discounts that force customers to satisfy all their demand from the dominant firm; (b) discounts related to the purchase of other products of the dominant firm; (c) discounts that are granted when the customer achieves certain purchase thresholds but are applied retroactively to all quantities that have already been purchased by the customer in a sufficiently long period of time[42]; (d) discounts granted if the customer increases its demand, if the increase is large enough to encourage the customer to purchase mainly from the dominant firm.

This essentially negative attitude towards loyalty-inducing discounts could be justified in the light of an antitrust policy aimed to making it difficult for

[41] See, for example, the CFI decision of 17 December 2003 in Case T-219/99 *British Airways plc v. Commission*, ECR [2003] p. II-5917.
[42] See Commission decisions of 14 July 1999, *British Airways*, in OJEC [2000] L 30 / 1 and June 20, 2001, *Michelin II*, OJ [2002] L 143 / 1.

dominant firms to maintain their market position, facilitating the growth of actual and potential competitors.

However, it should be stressed that European antitrust authorities and courts are probably too restrictive here, as it is quite frequent that discounts, granted for a variety of rational business reasons, may take one of the forms that are likely to be considered as an antitrust offense. Thus, we should conclude that jurisprudence here does not respect to the basic criterion we outlined at the beginning of this chapter, i.e. that a behavior should be considered to be an offence only if it cannot be given a business rationale, apart from the objective of eliminating a competitor.

In general, a detailed economic analysis of the characteristics of the discount is essential. Take the simplest case of a discount that is normally considered to be lawful by the antitrust authorities in Europe, i.e. a volume discount. In order to understand its business rationale, the reduction in price is usually compared with the reduction in average unit cost. But this is not correct, as the discount accorded for (say) an order of 1000 units should be compared with the additional cost of that the firm has to bear in order to produce 1000 unit. In most cases, such an incremental cost would be lower than the average unit cost, as typically the additional output increases the degree of utilization of the production plant. An antitrust authority that compares the discount to the reduction in average unit cost, would therefore tend to conclude that the discount is excessive, and therefore that illegal. This would be a mistake.

A further relevant issue here is the treatment of antitrust discounts, granted by dominant undertakings to contrast their competitors' offers (this is often called a "meeting competition defence").

Let's consider a firm dominant on the national market, selling a product at € 100 on the whole territory, that has to face a new competitor in a regional market, that sells the same good at € 90[43]. The dominant firm may react by reducing its prices across the country or by reducing prices only in the region where it need to fight the competitor. Assuming that the discounted price offered by the dominant undertaking is not lower than cost, what are the antitrust implications of the two strategies?

Unfortunately, there is no clear answer to this question. In practice, an overall price reduction would not be regarded as illegal, as it would be regarded as part of a natural competitive process. If the competitor is as efficient as the dominant undertaking, it will be able to remain on the

[43] Our discussion here follows, in part, the recent contributions of Slater and Waelbroek [2004].

market; if it is less efficient, following the dominant firm reaction, it will exit the market.

On the other hand, selective price reductions are a much more risky strategy from the antitrust point of view. Although they may be justified with a variety of business reasons, at the end of the day an antitrust authority will always suspect that their true aim is only to eliminate a competitor. Even if this does not amount, in practice, to a sort of a rebuttable presumption, dominant companies should be very careful before they engage in selective discounts.

6.4.4 Margin squeeze and price squeeze

We have already discussed the essential facilities problem from the point of view of refusal to deal, considering access. If there is no regulator fixing the price for access, as it actually exists in several network industries, an infrastructure owner (say, which owns the gas pipes) which also provides the service that is produced with the infrastructure (sells gas), could provide access to competitors, but engage in pricing policies aimed at eliminating them. In practice, it could:

a. fix a very high price for network access, so that the costs of its competitors would be high, and they would be unable to compete in gas sales: this is known as a *margin squeeze* policy;
b. alternatively, use the profits it makes by selling access to cut so much its prices in the downstream gas market that competitors are unable to meet them: this is known as a *price squeeze* policy.

Although we are referring here for simplicity to infrastructures, it is important to notice that squeeze policies may arise in any sector[44].

The actual existence of a squeeze strategy is hard to assess. When the downstream prices of dominant firm are lower than those of its competitors, the latter will argue that the dominant firm is engaging in a squeeze policy, e.g. as it requires its downstream activities to pay a lower price for access than that paid by competitors. On the other hand, the dominant firm will reply that access price is the same for everyone and that competitors do not achieve satisfactory profits only because of their inefficiency.

[44] The principal cases at EU level mainly concern different sectors, such as sugar (see Commission Decision of 18 July 1988, *Napier Brown / British Sugar,* in OJEC [1988] L 284/41) and metal (see Case CFI of 30 November 2000, *Industrie des Poudres sphériques SA v. Commission,* T-5/97, [2000] p. II-3755).

In order to ascertain the existence of margin (or price) squeeze, antitrust authorities usually apply a two-step test designed to assess whether the price charged by the dominant operator is (a) higher than its own costs and (b) replicable by an "equally efficient" competitor, i.e. a competitor that has exactly the same costs than the dominant firm. The first test verifies that the dominant firm is not engaged in predatory pricing. The second test verifies that the prices charged by the dominant firm in the downstream market could actually be replicated by an efficient competitor. The economic logic of these tests is sound. Antitrust policy should not subsidize inefficient competitors, it should punish behavior that is irrational from a business point of view, as it would surely be irrational for a dominant company to sell at prices that are lower than its costs (first test), or are higher than its own costs, but do not allow it to obtain a reasonable profit (second test).

7 Horizontal mergers

There are three major types of mergers: a banana plantation may buy another banana plantation, and this is a horizontal merger. The banana plantation may buy a shipping company specialising in banana shipments (or the other way round), and these would be both vertical mergers. A banana plantation may buy a palm oil plantation, and this would be a conglomerate merger. All three types of mergers may give rise to anti-trust issues. Horizontal mergers are however those that are more likely to do so, and we shall only discuss these.

Horizontal mergers may hinder effective competition in two ways, namely:

> (a) by eliminating important competitive constraints on one or more undertakings, thereby increasing their market power (unilateral or non-coordinated effects);
>
> (b) by changing the nature of competition among firms in such a way that is significantly more likely that they will coordinate their behavior, raising prices (coordinated effects).

In the previous chapters, we discussed how to define markets, how to assess the existence of market power, and cartels. As merger analysis utilizes exactly the same tools, our discussion here will be very brief.

7.1 Unilateral, or non-coordinated, effects

The most direct effect of a horizontal merger is the weakening of competitive constraints. Consider a market with three firms, A, B and C. Before the merger, if A had increased its prices, customers could turn to B or C. After the merger, if the combined entity raises prices, customers can only turn to C. Thus, any merger decreases competitive constraints upon the remaining companies, but obviously such a reduction depends on two factors: the share of the combined entity, and the share of the other companies.

We have already discussed the complex relationship between market shares and market power, and therefore we have all the necessary instruments to analyze market power of the combined entity.

Typically, we will run a straight SSNIP test, if the relevant market consists of homogeneous products.

If products are differentiated, a concentration must however be assessed differently, depending on whether the merging companies produce goods more or less directly substitutable from the point of view of consumers: if they are not perceived as close substitutes, a concentration is unlikely to have distorting effects, although the market shares of the companies may be

relevant; if they are close substitutes, the cumulative market share must be considered at its face value.

In practice, in order to assess the effects of the merger, antitrust authorities will analyse:

(i) market shares of the merging firms, possibly with some adjustment to take due account of possible future changes such as, for example, exit or entry of firms, or market growth;

(ii) the degree of concentration of the relevant market. The overall structure of the market is evaluated on the basis of the HHI concentration index. Normally, it is unlikely that the merger poses antitrust problems if, post-merger, the HHI level: (a) is less than 1000, (b) is between 1000 and 2000, but the increase of the index is less than 250, (c) is higher than 2000, but with an increase of less than 150 points[45].

These are of course rule-of-thumb criteria, and other considerations may be sometimes relevant, as when the merger involves, for example, the disappearance of a new entrant, or of a "maverick" company. In these cases, the distortion of competition may be greater than what market shares and concentration indices may suggest. Similarly, if the merger occurs in a market where there are structural relationships among companies such as cross-shareholdings, this will be taken into account.

7.2 Coordinated effects

In markets with few firms, the elimination of a competitor through a merger may, under certain circumstances, facilitate the coordination of the remaining firms, which could raise prices above the competitive level, or limit the introduction of new capacity.

Coordination could take many forms, from explicit collusion to tacit collusion. In the first case, collusive behavior would be punished on the basis of cartel legislation. But when coordination would be the result, simply, of a spontaneous parallel conduct of the oligopolists (in which case, as we saw, we speak of tacit collusion), facilitated by the concentration, cartels repression would be a weak and costly policy instrument.

This is why in merger control, where the number of companies in the market is limited, antitrust authorities devote the utmost attention to coordinated effects. Again, the instruments which are utilized for such an

[45] In the United States, the HHI index-threshold values (that is as level as the increment) are slightly more restrictive (see *Horizontal Merger Guidelines*, published jointly by the *U.S. Department of Justice* and the *Federal Trade Commission* April 2, 1992, available at website: http://www.usdoj.gov/atr/public/guidelines/hmg.htm # 14 Chapter 1.5).

analysis are exactly those that we reviewed when we discussed cartels: typically, antitrust authorities would check if the nature of the market makes information exchanges easy or difficult, and if it allows effective punishment mechanisms to be put in place. When both these conditions are fulfilled, it is very likely that the merger will be challenged.

7.3 Potential vertical effects

A horizontal merger may have significant vertical effects, to the extent that it creates or strengthens the market power of the merged entity as a buyer of inputs from suppliers, or it allows it to control, or to strengthen the control, of an essential facility.

7.4 The efficiency defence

Typically, in a merger, the company expects to increase efficiency, but this is usually a private effect, in the sense that it benefits only the company. In some cases, however, it is reasonable to argue that these positive effects will also be passed on to consumers: they should therefore be taken into account when assessing the likely effects of a merger.

However, in order to accept such a defence, antitrust authorities will normally check that two cumulative conditions are satisfied, i.e. that the efficiency improvements will actually be passed on to consumers, and post-merger, that there is still procedural competition in the market to make it reasonable to assume that such efficiencies will be "competed away", by giving rise to price decreases, that will benefit consumers. In such an analysis, it is more likely that the antitrust authority will regard more positively efficiencies that reduce variable costs, than efficiencies that instead reduce fixed costs. This is not surprising.

As we know, production decisions by firms are based on rules that consider marginal cost. If this falls, other things being equal, firms will produce more, and this is likely to result in a benefit for consumers. If the increase in efficiency resulting from the merger only reduces fixed cost, this will have no impact on production levels, but certainly an impact on average costs and therefore on profits, but this will be a private effect.

7.5 Remedies

At the end of its assessment, the antitrust authority can authorize the merger, forbid the merger, or authorize it subject to certain corrective measures, normally known as remedies.

These may be structural or behavioral, and basically they seek to decrease the competitive distortions generated by the merger, by addressing both unilateral and coordinated effects.

A common remedy addressing the first issue is a reduction in capacity of the merged entity through the sale of a subsidiary or a business unit. In order to decrease the risk of coordinated effects, the antitrust authorities may accept the sale of minority shareholdings of the merged entity in a competitor.

These are all examples of structural remedies. Less frequently, also behavioral remedies may be accepted (antitrust authorities are reluctant to accept them as these imply some form of monitoring by them, which reduces the resources they can dedicate to antitrust enforcement). A typical behavioral remedy, when essential facilities are concerned, is a commitment to provide third parties with access rights to the infrastructure owned by the merged entity.