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Dominance and Monopolization

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1. Introduction

Mixed feelings
A firm is in a dominant position if it has the ability to behave independently from its competitors. Dominant firms strike the attention of many and often lead to mixed feelings. Consumers look happy when branding makes life predictable, but grumble when their favorable brand raises its price. Policy makers may be proud of their Heinekens, Microsofts or McDonalds, but are unhappy if they restrict choices. Rivals of dominant firms might be lucky if the dominant firm is a toothless giant, but a predatory tiger scares them off. Dominant firms also give journalists plenty to write about, but it can easily get boring ('yet another Enron scandal').

Ambiguous welfare consequences
The mixed feelings can be easily explained. It is not clear whether dominant firms are welfare reducing or welfare enhancing. There are lots of reasons for that. First, a dominant firm can be a successful innovator, typically good for welfare. But it can also be a firm that emerged from an anti-competitive merger, typically bad for welfare. Second, some ex post behavior may have adverse welfare consequences even when dominance stemmed from innovation. An innovator may engage in such abuses as predatory pricing that might well prevent or delay subsequent innovations. Third, when dominant firms engage in behavior that might reduce welfare (such as predatory pricing), how can such behavior be distinguished from normal efficiency enhancing business practices (such as stunting)? Fourth, welfare reductions today might be traded off against welfare gains tomorrow (or vice versa), and who is going to determine which generation goes first?

What is welfare?
When we assess the status and behavior of dominant firms using 'welfare' as the criterion, we do what most economists would seem to find 'normal'. Yet there are a number of subtle discussions behind this presumed 'normality'. Welfare is an often used notion in economic and legal texts, but there are several conflicting definitions. Welfare in the classical sense is used in the first welfare theorem, which says that a competitive equilibrium is Pareto optimal. The problem is that we are faced with real life markets that do not satisfy the nice properties that are required for the first welfare theorem to hold. Most notably, treating agents as price takers is simply not on in any real life market, let alone in markets where dominance is an issue. So we leave Pareto and general equilibrium aside, and move towards partial equilibrium

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analysis. The two most common welfare notions in industrial economics are consumer surplus and total surplus, i.e. the sum of consumer and producer surplus.

Consumer and producer surplus

Why would one look at consumer surplus rather than to total surplus in welfare analysis? The dead weight loss argument is the most straightforward reason for looking at consumer surplus (see figure 1). In a simple monopoly setting, total welfare is maximized if consumer surplus is maximized and price equals marginal cost. The reason is that maximizing consumer surplus implies minimizing the dead weight loss (see e.g. Tirole 1988). Yet there are more complex settings in which the two welfare notions diverge. A too simplistic application of the dead weight loss argument results in ignoring dynamic considerations which are also important for consumers. Consumers appreciate innovation and product choice, but they are not part of dead weight loss triangles. How does this compare with the goals of competition authorities?

The early goals of competition authorities, the US and Europe

It is not obvious that competition authorities (always) strive for maximization of (consumer) welfare. In the US, antitrust policy was a reaction to the formation of trusts that concentrated economic power. Small firms and farmers complained about the economic power of these trusts and lobbied for protection.

After World War II, competition policy was imposed on Germany by the occupation authorities. Germany had known a Cartel Law from 1923, but cartels were not forbidden: they just had to be registered. In fact, the Nazis made participation in cartels compulsory and thereby coordinated economic decisions and created economic power. The German competition law (perhaps as a result of that) stresses economic freedom, and maintaining economic freedom may be seen as one of the main goals of their competition law. A strict interpretation of maintaining freedom of action would conflict with the efficiency goal.[1]

Within the EC, competition policy is an instrument to achieve the goals of the Community: (roughly) the creation of a single market area with a high standard of living for all those that live in it. Consequently, within the EC, two goals are usually distinguished: market integration and economic efficiency. Note that these two goals may conflict: market integration, when interpreted as the prohibition of price discrimination across countries, may go at the expense of economic efficiency.

Conflicting goals of competition law

From above it followed that there are various potential goals of competition law and that some goals can conflict. Two cases that are interesting in this respect are UK Distillers and Ford/Volkswagen. In UK Distillers, the Commission was upset by price discrimination by the Distillers Company for Whisky between France and the UK. When ordered to end the practise, the company simply stopped supplying the French market, leaving prices in UK unchanged. In Ford/Volkswagen, the Commission allowed a joint venture of these two car makers to produce MPV's (Volkswagen Sharan and Ford Galaxy) in Portugal, with the argument that this created jobs in Portugal and would lead to better integration of Portugal in the Community.

Within the public interest domain, one may distinguish several objectives for competition policy:

[1] Think about the discussion about vertical restraints.

(i) Maintaining competition,
(ii) Maintaining economic freedom,
(iii) Achieving market integration,
(iv) Maximizing total welfare,
(v) Maximizing consumer surplus,

It is difficult to argue what is the goal of a certain competition authority, although one may say that competition policy is guided by the objectives mentioned above. Within Europe, the text of Article 81 shows some evidence of the ambiguity. Article 81(1) prohibits all agreements between firms that restrict competition, but Article 81(3) exempts from the prohibition agreements that are efficiency-enhancing, provided that consumers get a fair share of the resulting benefits, hence, in Article 81(1), the goals (i) and (ii) feature (some even identify a restriction of competition with a restriction of freedom of action), while in Article 81(3) both goals (iv) and (v) feature. It also follows, therefore, that a criticism of a decision of a competition authority would be justified only if that decision cannot be justified on any reasonable combination of the above criteria that could be adopted by that authority.

One may argue that consumer welfare should be the goal of competition policy. For example, Robert Bork has stated "The only goal that should guide interpretation of the antitrust laws is the welfare of consumers" (Robert Bork: The Antitrust Paradox; A Policy at War with Itself, New York, 1993, p. 405). What can be inferred from official documents?

The Office of Fair Trading's mission is to:

> 'to protect consumers and explain their rights and to ensure that businesses compete and operate fairly'. (OFT site)

The European Commission puts it slightly differently:

> 'Competition in the marketplace is a simple and efficient means of guaranteeing consumers products and services of excellent quality at competitive prices. Suppliers (producers and traders) offer goods or services on the market to meet their customers' demands. Customers seek the best deal available in terms of quality and price for the products they require. The best deal for customers emerges as a result of a contest between suppliers.
>
> Competition policy aims to ensure wider consumer choice, technological innovation and effective price competition, thus contributing to both consumer welfare and to the competitiveness of European industry. This is achieved by ensuring that companies compete rather than collude, that dominant companies do not abuse their market power and that efficiencies are passed on to final consumers.' (EC site)

The Federal Trade Commission in the U.S finally puts is as follows:

> '… enforces a variety of federal antitrust and consumer protection laws. The Commission seeks to ensure that the nation's markets function competitively, and are vigorous, efficient, and free of undue restrictions. The Commission also works to enhance the smooth operation of the marketplace by eliminating acts or practices that are unfair or deceptive. In general, the Commission's efforts are directed toward stopping actions that threaten consumers' opportunities to exercise informed choice. …

In addition to carrying out its statutory enforcement responsibilities, the Commission advances the policies underlying Congressional mandates through cost-effective non-enforcement activities, such as consumer education.'

Reconciling consumer and total surplus

The common element is that (apart from possible other goals) competition authorities protect consumers and assume that vigorous competition is the right tool of getting good deals for consumers. In theory it is possible to somehow reconcile total surplus and consumer surplus. Consumer surplus in the long run comes closer to total surplus than just consumer surplus in the short run. Maximizing consumer surplus in the long-run must involve producer surplus. Profits are necessary to invest and innovate, and are therefore also ingredients in consumer benefits in the long run. Of course, this is no hard evidence in favor of consumer surplus and one type of nuance is needed. Consumer surplus is only a reasonable approximation of welfare if long run effects are taken into account. It is not automatic that competition authorities do this.

Empirical evidence of concentration

The attention that scholars and policy makers dedicate to monopolies, oligopolies and dominant firms suggests that there are indeed lots of dominant firms around. It is not feasible (at least not at this moment) to test 'dominance' per se, but given the (statistical) correlation between size (market shares) and dominance, we use concentration tendencies as a rough approximation for dominance. This exercise is not to test a certain hypothesis, but to get a feeling for numbers and trends.

We start with a discussion of the older evidence (e.g. Maizels (1992), D. Mueller (1986)). The international commodity market is dominated by a few multinational corporations (Cowling 2002). Concentrated industries also tend to be more profitable, also in the long run (D. Mueller, 1986). Of more recent significance is the concentration in the communications, IT and media industries. In the USA, in 1985, there were 14,600 commercial banks. The 50 largest owned 45.7 of all assets, the 100 largest held 57.4%. In 1984 there were 272,037 active corporations in the manufacturing sector, 710 of them held 80.2 percent of total assets. In the service sector 95 firms of the total of 899,369 owned 28 percent of the sector's assets. In 1986 in agriculture, 29,000 large farms (1.3% of all farms) accounted for one-third of total farm sales and 46% of farm profits. In 1987, the top 50 firms accounted for 54.4% of the total sales of the Fortune 500 largest industrial companies. (Richard B. Du Boff, Accumulation and Power, p. 171).

In the U.K., the top 100 manufacturing companies saw their market share rise from 16% in 1909, to 27% in 1949, to 32% in 1958 and to 42% by 1975. In terms of net assets, the top 100 industrial and commercial companies saw their share of net assets rise from 47% in 1948 to 64% in 1968 to 80% in 1976 (RCO Matthews (ed.), Economy and Democracy, p. 239). Looking further, we find that in 1995 about 50 firms produce about 15 percent of the manufactured goods in the industrialized world. There are about 150 firms in the world-wide motor vehicle industry. But the two largest firms, General Motors and Ford, together produce almost one-third of all vehicles. The five largest firms produce half of all output and the ten largest firms produce three-quarters. Four appliance firms manufacture 98 percent of the washing machines made in the United States. In the U. S. meatpacking industry, four firms account for over 85 percent of the output of beef, while the other 1,245 firms have less than 15 percent of the market.

Another fact is that large companies tend to become more diversified as the concentration levels in individual industries increase. Tobacco companies are the masters of diversification. Jell-O products, Kool-Aid, Log Cabin syrup, Minute Rice, Miller beer, Oreos,

Velveeta and Maxwell House coffee are all brands owned by Tobacco companies (www.geocities.com).

More recent evidence points in the same direction. Many European and U.S. markets are consolidating in rapid fashion (Schenk 2002, Tichy 2001). Yet, most mergers tend to be unhappy[2]. Does that mean that the large firms destroy welfare?

Whether the concentrations are as bad as some people let you to believe is unclear. The mere fact that the merged parties are on average unhappy ex post, does not mean welfare is reduced, since the source of unhappiness is unknown. Perhaps they are unhappy because competitors reacted fiercer than anticipated. Perhaps welfare was reduced for the merged parties but not for their competitors or for the consumers. A priori, the tendencies can equally likely point at increased possibilities of exploiting scale and scope economies as at increased abuses of market power. It is the duty of Competition authorities to make up their mind which of the two prevails.

Persistence of dominance

So we observed that oligopolies and (near) monopolies occupy large and important parts of the economy. Yet, there seems to be a widespread presumption among economists that dominant firms have a tendency to decline. It is important to check in how far this presumption is right, since rapidly declining dominant firms obviously affect optimal policy responses. To our knowledge Geroski (1987) and Mueller (1986) are the only one to have actually tested this empirically. Checking the actual decline of market leaders in the U.K. and the U.S., Geroski finds no evidence of actual decline, defined as some mix of incumbent's erosion of profits and market shares over time. E.g. market share based result was that of the 108 observed dominant firms, 32 did not decline, between 46 and 51 declined 6 percent or less (Geroski). However difficult these results are to be interpreted, it shows that there is no such thing as systematic rapid decline of dominant firms. D. Mueller (1986) studied the largest 1000 firms in the U.S. in the period 1950-1972 and concluded that the typical persistently high earning firm has a large market share and sells differentiated products.

By lack of stronger evidence, we will employ the working hypothesis in this chapter that alert dominant firms, when left untouched by competition authorities, have enough possibilities to maintain their position, at least in a non-trivial number of cases.

Policy responses towards dominance: two polar views

Most of what we have discussed so far is not altogether controversial. Yet when we will discuss policy responses to behavior by dominant firms, there is more room for controversy. We distinguish two polar views. At one side of the spectrum is what we call the 'Schumpeter-visits-Chicago position'. This position takes a relaxed view towards dominant firms, arguing that dominant firms are in general good for consumers, create lots of jobs, innovate, and exploit scale economies. It typically downplays potential adverse effects of dominant firms, suggesting that the adverse effects are temporary and cannot be detected at socially acceptable costs anyhow. In the words of Schmalensee: [3]

> 'Firms may achieve short-run dominance through merger or other actions that are not directly productive. But most dominant positions, particularly those created in the US after 'merger for monopoly' was ruled illegal in 1903, have their origins to an important extent in innovation, broadly defined. Firms that attain short-run dominance by merger or other means but have no advantages over actual and potential rivals and

[2] Schenk 2002 Tichy 2001, Mueller (2001).
[3] Schmalensee is in fact more moderate than the polar position suggests.

> are badly managed tend to perform poorly and lose dominance in a matter of years. In other cases, dominant positions may take many decades to decay appreciably.'

It comes as no surprise that the 'Schumpeter-visits-Chicago position' is also particularly worried about possible adverse effects of government intervention. The favorite quotes are 'The successful competitor, having been urged to compete, must not be turned upon when he wins' (Judge Hand in the Alcoa case) and 'enforcement of the US antitrust generally involves winner-bashing' (Robert Shapiro).

At the other side of the spectrum is what some might be tempted to baptize 'Old Europe'. Here the aim is to 'chase the villains'. It finds supporters among a number of regulators, competition authorities, politicians, anti-globalists and some academic scholars. In the words of Cowling (2002):[4]

> 'We can conclude at this point that oligopolistic structures generally prevail at some stage of the global production process: obviously a myriad small production units exist, but they exist within a system dominated by relatively few giants. The implication is that we can expect a general divergence of prices from the competitive level. We shall now assess theoretical grounds and empirical evidence for the significance of this divergence, the factors underlying it and the consequences for profits, and thus for the broad distribution of income between capital and labour.'

At this side of the spectrum there is less worry about dynamic features and government failure. The favorite quotes here are from the Michelin case (in 1983 #57) 'a finding that an undertaking has a dominant position is not in itself a recrimination but simply means that, irrespective of the reasons for which it has such a dominant position, the undertaking concerned has a special responsibility not to allow its conduct to impair genuine undistorted competition on the common market' and Hicks's 'The best part of a monopoly is a quiet life'.

Type I versus type II errors

Differences between the two polar views can be explained by different weights that are attached to type I and type II errors. With judge Hand's Alcoa quote in mind, it is unsurprising that the Schumpeter-visits-Chicago-position dislikes unjust convictions of innocent firms. This parallels American cultural habits of rewarding winners and ignoring losers. Equally so, Old Europeans tend to protect the poor and weak, and henceforth put more weight on type II errors. Both polar views seem to have some good arguments and some bad ones. Available empirical evidence also produces a mixed ball.

Combining insights from both polar views

Most economists would adopt arguments from both sides and we are no exceptions. First we see no reason to take a relaxed attitude towards dominant firms. There are robust economic theories showing that dominant firms have all the incentive and ample possibilities to reduce welfare, however measured. There is no indication that dominant firms spontaneously fall apart (Mueller, Geroski) nor are there convincing arguments that (persistent) dominance is required to innovate.[5] Dominant firms also produce the large bulk of the economy and occupy

[4] Cowling is in fact more moderate than the polar position suggests.

[5] Reviewing the literature on competition and innovation, Bennett, De Bijl and Canoy (2002) conclude: 'It is generally true to say that the rate of innovation per firm will increase with competition when the degree of competition is not already too severe. … However, increasing the number of firms when the underlying industry structure is already monopolistic generally increases the rate of innovation both at the firm level and at the industry level.'

seats in vital sectors of the society such as telecom, banks, electricity, transport and so forth. This means that underperformance of dominant firms may also have adverse non-economic effects. So these are useful Old Europe arguments. Yet, dominant firms are often firms that heavily invest in infrastructure, assets or innovation. A government that decides to intervene in this type of market should be aware of the potential consequences of intervention, in particular the consequences of making mistakes. As Fisher (1991) has put it in the context of monopolies:

> "Economists and others ought to approach the public policy problems involved in these areas with a certain humility. Real industries tend to be very complicated. One ought not to tinker with a well-performing industry on the basis of simplistic judgements. The diagnosis of the monopoly disease is sufficiently difficult that one ought not to proceed to surgery without thorough examination of the patient and a thorough understanding of the medical principles involved."

A mistake in a market with a lot of dynamics and big stakes is not only more consequential, also the probability that a mistake is made is larger than in other markets. A lot of dynamics implies more uncertainty, therefore a higher probability of mistakes. Also, the need for intervention reduces when markets tomorrow will look different from markets today. As a consequence of this, government intervention should be proportionate to the problem, no more and no less.

Competition law versus other policy instruments

Counteracting potential welfare reductions by dominant firms is typically the policy area of competition law. Competition law has been designed to prevent serious welfare reducing actions by firms, such as cartel agreements, and to punish such actions when they occur. Competition law can also block mergers if the merging parties threaten to become too powerful. However, competition law has not been designed to counteract all possible welfare reducing actions. First of all, for reasons explained above, not all welfare reducing actions require countermeasures, and, secondly, legal solutions are not always the best solutions. Competition law bears similarities to criminal justice. Villains must be punished, but many deviations from optimal behavior by civilians (such as being rude) is best left untouched or counteracted by other policy measures than legal actions (such as education). Canoy and Onderstal (2003) show in a number of oligopoly cases that policy measures such as entry barrier reduction, increasing transparency or reducing switching costs are likely to be much more successful than going for collective dominance cases and the like. In terms of type I and type II mistakes: In the legal history in the Western world it is commonplace to only convict criminals if their guilt is proven beyond reasonable doubt. This puts all the eggs in the type I basket. The reason is by and large normative in nature: as explained above, it is felt that only serious cases should go to court. For less clear-cut cases other instruments are easier to use. Policy makers have much more leeway than judges to do what they think is best. Whether this leeway is always used in a welfare enhancing way is of course a different matter.

This chapter further elaborates the welfare consequences of dominance and monopolization and possible policy responses to that. First section 2 delves deeper into the different policy responses towards dominance. What is the crucial difference between regulation and antitrust? Section 3 then introduces single dominance and different types of abuses of dominance. Section 4 discusses collective dominance. Section 5 compares legal approaches in the U.S. and Europe. Section 6 does the same with mergers. Section 7 concludes.

2. Regulation versus antitrust

Dominant firms are exposed to various types of supervision. In some cases, as for example in the telecommunications industry, they are subject to rather detailed, industry-specific regulation. In other cases, they are only subject to general antitrust supervision. It is therefore useful to start this chapter with a brief comparison of "regulation" and "antitrust"; several dimensions are relevant in this respect: timing of oversight, procedures and control rights, information and continued relationship.

Ex ante versus ex post

An important difference between regulation and antitrust is that the former operates mainly ex ante and the latter ex post. Antitrust authorities assess conduct after the fact while regulators define the rules for price setting, investment and profit sharing ex ante. Some qualifiers are in order, however, since for example merger control often requires notification for large mergers and is a quasi-regulatory process.[6]

Relatedly, ex ante supervision must be more expedient. The necessity not to halt productive decisions often puts pressure on regulators and merger control offices to converge on rapid decisions. In contrast, the ex post nature of antitrust intervention does not call for a similar expediency – except maybe for predatory cases, where interim provisions may be necessary to prevent irreversible damages.[7]

The uncertainty about the overseer's decision making differs between the two institutions. Ex ante intervention removes most of the uncertainty about this intervention (although not necessarily about its consequences); it may thus facilitate financing of new investment by alleviating the lenders' potential informational handicap with respect to this intervention and by sharpening the measurement of the firm's performance.

Ex ante intervention also improves the supervisor's commitment toward the firm. This commitment is desirable whenever the industry supervisor has the incentives and the opportunity to exploit the firm's efficiency or investment. To be sure, competition authorities can publish guidelines to pre-announce their policy. However, these guidelines may still leave some scope for interpretation, and moreover they need not be followed by the courts.

Finally, ex ante intervention may force the firm to disclose information that it would not disclose ex post. It is indeed often less risky for the firm to conceal or manipulate information ex post than ex ante; for instance, the firm may know ex post that a lie about an information that conditioned some business decision will not be discovered, but it may have no such certainty ex ante. Relatedly, an ex ante regulator can ask the firm to collect and organize information in a given way; getting specific information ex post may prove difficult if it is not planned for in advance.

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[6] See Neven-Nuttall-Seabright (1993) for a relevant discussion of institutions in the context of merger control. In the E.U., inter-firm agreements that would fall under Article 81 must also be notified in order to benefit from an exemption; however, following a recent reform, these agreements will be dealt with "ex post" from next Spring on. Berges-Sennou *et al.* (2001) formally compare the prior notification regime with the ex post audit regime and stress that the balance tilts in favour of the latter as the competition agency's scrutiny becomes more precise.

[7] In particular, ex post intervention may serve as a deterrent but come too late to act as a corrective device.

A drawback of ex ante intervention is that it may foster collusion between the industry and the supervisor. The industry knows whom it is facing while it is much more uncertain about whether it will be able to capture the (unknown) overseer in a context in which the oversight takes place ex post. This uncertainty about the possibility of capture increases the firm's cost of misbehaving.

A second benefit of ex post intervention is of course the opportunity to take advantage of information that accrues "after the fact". For example, it may over time become clearer what constitutes acceptable conduct. To be certain, ex ante decisions could in principle allow for ex post adjustments that embody the new information; but describing properly ex ante the information that will determine acceptability may be prohibitively difficult.

Procedures and control rights

While antitrust authorities usually only assess the lawfulness of conducts, regulators have more extensive powers and engage in detailed regulation; they may set or put constraints on wholesale and retail prices, determine the extent of profit sharing between the firm and its customers (as under cost-of-service regulation or earnings-sharing schemes), oversee investment decisions, and control entry into segments through licensing for new entrants and line-of-business restrictions for incumbents.[8]

Regulators' discretionary power is of course qualified by the many constraints they face in their decision making: procedural requirements, lack of long-term commitment, safeguards against regulatory takings, constraints on price fixing or cost reimbursement rules (cost-of-service regulation, price caps, etc.), cost-based determination of access prices, and so forth.

Conversely, antitrust authorities and courts sometimes exercise regulatory authority by imposing line-of-business restrictions or forcing cost-of-service determination of access prices. A case in point is Judge Greene becoming a "regulator" of the American telecommunications industry. In Europe, where there has been a growing interest in essential facility and market access issues, the European Commission has tried to develop both antitrust and regulatory competences and methods.

There is some convergence of regulatory and competition policy procedures. For example in the US, regulatory hearings are quasi-judicial processes in which a wide array of interested parties can expose their viewpoints. The enlisting of 'advocates' is prominent in both institutions and contributes to reduce the informational handicap of the industry overseer.[9]

There are also a couple of differences, however. Private parties tend to play a bigger role in antitrust enforcement than in a regulatory process – indeed, while competition authorities occasionally conduct independent industry studies, the vast majority of cases are brought by private parties. Another difference is that interest groups are motivated to intervene in the regulatory process solely by the prospect of modifying policy while they complain to competition authorities or courts either to modify industry conduct (through an injunction) or to obtain monetary compensation (e.g., treble damages in the US). Yet another difference

[8] For example, in the U.S. the Federal Communications Commission has imposed price caps to limit the exercise of market power, while such behaviour would not be an antitrust offence. In the E.U., excessive prices could constitute an abuse of a dominant position under Article 82, but so far the European Commission has rarely used this possibility.

[9] See Dewatripont-Tirole (1999) for a formal analysis.

comes from the fact that competition authorities have less control over the agenda than regulators – courts' and, to a lesser extent, competition authorities' activities are somewhat conditioned by the cases that are brought to them.

Another distinction between the two institutions is the possible separation between investigation and prosecution in antitrust. Regulators conduct regulatory hearings and adjudicate on their basis, while at least in some countries competition authorities may have to win their case in court.[10] For example, in the US the decisions of the Federal Communications Commission (FCC) take directly effect (except if appealed); in contrast, the Antitrust Division of the Department of Justice must not only go to court but it moreover bears the initial burden of proof. Regulatory decisions may however be appealed in court, in the same way a court decision may be overruled by a higher court.[11]

Last, while regulators and competition authorities are both required to apply consistent reasoning, regulators are mainly bound to be somewhat consistent with their previous decisions for the industry they oversee. In contrast, competition authorities and courts must also refer to decisions pertaining to other industries – and in common law systems, they must moreover take into account other courts' decisions.[12]

Information and expertise

Regulatory decisions tend to rely on superior expertise. While antitrust enforcers have a fairly universal mandate, regulatory agencies usually specialize on a specific industry on a long-term basis. In addition, regulators usually have larger staffs and monitor the firms' accounts on a continuous basis rather than on an occasional one; they can also insist on specific accounting principles (such as accounting separation) as well as disclosure rules.
Superior expertise allows better informed decision making. For example, regulators may use cost-based rules for retail and wholesale prices in spite of the difficulty in assessing costs, while antitrust enforcers are more at ease with cases based on qualitative evidence (price discrimination, price fixing, vertical restraints,...) than with cases that require quantitative evidence (predation, tacit collusion, access pricing,...).

Superior expertise may however be a handicap when regulators have limited commitment powers. When a firm lowers invests to improve its technology, regulators (or politicians) may wish confiscate the efficiency gains – e.g., through lower prices. The regulator's access to information exacerbates this "ratchet effect", which impedes efficiency. Similarly, an excessive attention may inhibit the firm's initiative. In contrast, an arm's length relationship may entail more commitment power and help provide better incentives.13

[10] This is for example the case in the US; in contrast, in the EU the European Commission both investigates and decides. It is however currently devising ways to disentangle these two aspects, in the line of what has been adopted in European countries such as France, where the Competition Council – a jurisdictional entity with decision powers – has different bodies in charge of investigations and decisions.
[11] In the case of the FCC, however, federal courts limit themselves to ensuring only that the Commission acts in a "reasonable" manner and does not engage in "arbitrary and capricious" behaviour. In contrast, the Antitrust Division is not entitled to substantial deference.
[12] The interaction between the two sets of case law is also interesting. The new European regulatory framework for telecommunications fosters a convergence of the two worlds and emphasizes for example that regulators must use available competition principles.
[13] See, e.g., Crémer (1995) and Aghion-Tirole (1997).

The regulatory agencies' expertise stems in part from its long-term relationship with the industry. But, as is well-known, long-term relationships are, in any organization, conducive to collusion. In addition, the need for industry-focused expertise imposes constraints on the recruitment of regulators, and natural career evolutions are more likely to involve close links with this industry; as a result, the regulators' expertise may reinforce "revolving doors" problems.

This brief overview of the analogies and differences involved in the two types of supervision suggests that antitrust supervision by a "generalist" competition agency is best suited when detailed regulation is not crucial; in contrast, oversight by an industry-specific regulatory agency may be warranted when detailed ex ante regulation is needed, as it may for example be the case for access policies.

We now turn to the antitrust policy towards single and collective dominance.

3. Single Firm Dominance and Monopolization

3.1 Introduction

Background
Throughout the world, competition authorities ask the question: 'How do firms with (substantial) market power behave?', or more specifically: 'How can firms with (substantial) market power exploit this power?'. The economic literature can help answering these questions. Indeed, for decades monopolies and oligopolies have filled economic textbooks and governments have longstanding traditions in using these theories to design policy responses to counter adverse effects of powerful firms. Yet, real-life markets do not always behave according to textbook predictions. Assessing monopolistic and oligopolistic behavior is complex and cannot be solely based on textbook predictions.

Over the last decade an increasing number of scholars stressed the importance of finding a neat balance between unfettered competition and intervention. As explained in the introduction, the laissez fair Schumpeter-visits-Chicago-view stresses the importance of free markets and innovation while the Old Europe view points at what can go wrong in free markets. Using arguments from both sides, it is perhaps best to scrutinize abuses of a dominant position while realizing the potential downsides of government intervention. Against this background, this section describes what market power amounts to, and how firms can abuse market power.

Definition of single firm dominance
According to the European Commission official documents dominance is defined as follows:

> 'A firm is in a dominant position if it has the ability to behave independently of its competitors, customers, suppliers and, ultimately, the final consumer.'

The crucial words here are 'to behave independently'. By behaving independently firms can mimic monopoly behavior and thereby reduce welfare:

> ‘A dominant firm holding such market power would have the ability to set prices above the competitive level, to sell products of an inferior quality or to reduce its rate of innovation below the level that would exist in a competitive market.’

Crucial here are the words ‘have the ability’. A dominant position is a status not an action:

> ‘Under EU competition law, it is not illegal to hold a dominant position, since a dominant position can be obtained by legitimate means of competition, for example, by inventing and selling a better product. Instead, competition rules do not allow companies to abuse their dominant position. The European merger control system differs from this principle, in so far as it prohibits merged entities from obtaining or strengthening a dominant position by way of the merger.’

To punish a dominant firm, one has to show that the firm actually makes use of ‘the ability to behave independently of its competitors... etc’. To show that the probability of abuse after a merger has increased (significantly), creates a high burden of proof for merger analysis, which is by nature ex-ante. That is why it is sufficient to show that a dominant position is sufficiently likely to emerge after a merger.

The U.S. approach

The US has a longer tradition of dealing with firms with market power, starting with the Sherman Act in 1890, the Clayton Act in 1914 and the Federal Trade Commission Act in 1914. The motivation of these acts (in particular the Sherman Act) was not to enhance efficiency. Rather, the Act was motivated primarily to protect small and medium sized businesses.[14] Despite this motivation, the legal practice developed more and more in the direction of the ‘efficiency doctrine’, e.g. judges are unhappy to block a merger just to protect some small player in the market.[15]

The general approach in the U.S. is to outlaw monopolization, attempts to monopolize or conspiracies to monopolize. Similar to the dominance doctrine it requires firms to have market power. Lots of practices can be illegal (e.g. sabotage, mergers, refusal to deal, tying, price discrimination, raising rival’s cost etc)[16], but all of them require firms to have ‘sufficient market power’. Since an appropriate definition of market power is: ‘the power to raise prices above the competitive levels without losing so many sales that the price increase is unprofitable’[17], having ‘sufficient market power’ is very similar to dominance. So we conclude that the *general* approach towards monopolization is not fundamentally different on both sides of the ocean. That is not to say that there are no important differences, though.

The U.S. approach is aimed at *preventing* monopoly situations. It is less worried about *actual behavior*, once a monopoly has been established. By contrast, the European approach forbids various types of conduct by dominant firms. More detailed differences will be addressed below as well as in section 5.

Economic models of single firm dominance I: monopoly

There are basically two different economic models underlying single firm dominance. The first one is the most straightforward one: the monopoly model. A monopolist obviously ‘has the ability to behave independently of its competitors, customers, suppliers and, ultimately,

[14] Hovenkamp, H. 1994 Federal Antitrust Policy, The law of competition and its practice, West Publishing Co.
[15] See also Fox.
[16] See Hovenkamp (1994).
[17] Graphic Products Dist., Inc. v. Itek. Corp. 717 F 2d 1560, 1570 (11th Cir. 1983), see further Hovenkamp.

the final consumer'. It is well-known that monopolies have an incentive to raise price above the competitive level, at the expense of consumers. That is, according to the dead weight loss triangles in economic textbooks.[18] Indeed, in the most straightforward textbook model, monopolies have an incentive to produce less than is socially desirable. There are also more subtle ways in which welfare can be reduced by monopolists, such as rent-seeking, lack of innovation incentives, X-inefficiencies and suboptimal product selection. These suboptimal effects need not occur. Counter forces include the exploitation of scale economies, the threat of potential entry, commitment problems[19] and innovation.

Which of these forces prevail is hard to say. Even in concrete cases such as the Microsoft case economists tend to disagree on the appropriate economic model and the welfare consequences. Nevertheless, some general conclusions can be drawn.

- In a market characterized with relatively modest scale economies, lack of fast innovation and entry barriers, monopolies tend to set suboptimal levels of output and price.
- Even in the presence of counter forces, such as innovation, monopolies can still reduce welfare.
- Even if monopolies do reduce welfare, it is neither straightforward nor costless to counteract such monopoly behavior.
- Whether or not counter forces do outweigh the welfare losses associated with monopolies, is context dependent.

Economic models of single firm dominance II: oligopoly

The second economic model behind single firm dominance is the oligopoly model. Casual observation suggests that oligopolies are covered by collective rather than single firm dominance, but this is not the case. Take an oligopoly that consists of one large player, say with a market share of 50%, and smaller players, say 20%-15%-15%. In such an oligopoly two things might happen that might raise concern. The first one is that the oligopolists manage to tacitly collude e.g. on price. Here we enter the world of collective dominance, to be discussed in section 4. The second concern is if the large firm succeeds in abusing its position to unilaterally 'behave independently of its competitors, customers, suppliers and, ultimately, the final consumer'. However, if that is the case, it is not clear which 'oligopoly' model should apply, since the firm in question apparently behaves as a monopolist. The fact that the market structure looks more like an oligopoly than a monopoly seems irrelevant. However, this observation denies the importance of strategic interactions.

What does it mean, in the context of an oligopoly, to behave 'independently' of its competitors? Section 3.2 provides economic examples of (abuse of) independent behavior, such as predation and foreclosure. These examples are characterized by the fact that a single firm punishes a (potential) competitor. It can only profitably do so if it faces relatively little competition. Competitive forces will make (anti-competitive) price discrimination unattractive, which will prevent predation as well as foreclosure. This does not mean that the monopoly model applies. Oligopoly theory teaches us how firms interact strategically. A dominant firm that attempts to eliminate a rival by predatory pricing has both to predict how the prey will react to the prices, as well as to predict responses by future rivals. Hence strategic interaction and oligopoly theory are as vital for understanding single firm dominance as monopoly theory.

[18] See also the introduction.

[19] Such as in a Coasian type durable goods monopoly, see section 3.2.

The use of oligopoly models becomes clear when studying attempts to deter entry. Firms with market power who want to deter entry have to play a strategic oligopoly game with (potential) rivals. The outcome of such a game determines whether or not deterring entry is a profitable strategy. The outcome of the game is influenced by the parameters of the game. In a stylized two-period, two-firm model the incumbent firm chooses some variable X (e.g. capacity) in period 1. Firm 2 (the potential entrant) observes X and decides to enter or not. In period 2 some strategic variable (e.g. price) is set. The parameters that influence the Nash equilibrium of such a game are: whether or not the strategies are substitutes (quantities) or complements (prices), the level of asymmetry, the level of product differentiation, the switching costs etc.[20] So what appears to be 'monopoly behavior' could easily be sustained as a Nash equilibrium in an oligopoly game. It becomes clear that oligopoly models are vital tools for understanding incentives by powerful firms to deter entry. The same applies for other types of behavior such a raising rival's costs or predation (see further next section).

There is also another important category of so-called 'independent behavior'. It is best explained in the context of a potential merger in a Cournot type setting. First in the words of the Commission:

> 'Under certain circumstances, a merger weakens competition by removing important competitive constraints on one or more sellers, who consequently find it profitable to increase prices or reduce output post merger. The most direct effect will be the elimination of the competitive constraints that the merging firms exerted on each other. Before the merger, the merging parties may have exercised a competitive constraint on each other. If one of the merging firms had raised its price or reduced then it would have lost customers to the other merging firm, making it unprofitable. The merger would thus eliminate this particular constraint. In addition, non-merging firms can also benefit from the reduction of competitive pressure that results from the merger since the merging firms price increase or output reduction may switch some demand to the rival firms, which, in turn, may find it optimal to increase prices. The elimination of these competitive constraints could lead to a significant price increase or output reduction in the relevant market.' (http://europa.eu.int/comm/ competition/mergers/review/final_draft_en.pdf)

Put differently: if there are four players playing ala Cournot, a merger between two of them will ceteris paribus reduce output and increase price. It is questionable whether this particular interpretation of 'independent behavior' should fall under the heading of dominance. In economic terms this type of oligopoly behavior can hardly be called 'independent' since it depends inter alia on conjectures on behavior of other players. It is also not related to market shares. The same arguments can be used whether or not we are facing a 50-20-15-15 split or a 25-25-25-25 split of the market.

It is notable that the Cournot type unilateral effects in oligopolies mentioned above are not part of the 'old' dominance definition, and hence neither in the dominance definition used in article 82 cases. For the purposes of this Chapter we prefer to keep the old definition of single firm dominance (with a possible exception to mergers) , i.e. interpreting 'independent behavior' in a rather strict sense, i.e. excluding Cournot type behavior.

Concluding, the monopoly model is important for its focus on behavior by a firm that faces little (or no) competition. The oligopoly model is important for its focus on strategic

[20] Fudenberg and Tirole (1984) provide a taxonomy of entry deterring strategies.

interaction. Even if a firm faces little competition, its behavior can easily be based on strategic motives, e.g. attempts to deter entry.

What contributes to a firm being 'dominant'?

Since it is not clear a priori under which circumstances firms are able to 'behave independently', there is need for further clarification. The most common legal tool to test whether or not a firm is dominant, is the market share test. If a firm has a 40-50% market share, then a firm is assumed to have so much market power than it can be called dominant. While being practical, measurable and legally accepted, from an economic perspective the market share test is too simplistic for two reasons. First, even large players need not be dominant. In the case where innovation is taking place at a rapid pace, in the case of fierce competition between large players, or strong disciplining by potential entrants, firms cannot 'behave independently'. Second, there can be cases where firms have lower shares, say 25%, but are still dominant. This can occur if entry barriers are high and market power is reflected through other channels than just market share. Arguably, such cases are statistically less significant[21], but should not be neglected.

The arguably most extreme position towards market power was taken by judge Wyzinski in United Sates v. United Shoe Machinery Corp. He claimed that a firm with sufficient market power monopolizes 'whenever it does business'. This position has not been followed on either side of the Atlantic Ocean.[22] Instead, firms have to be in a dominant position *and* abuse the position. Why is this needed? There are basically two reasons. First, a firm can owe its dominant position to superior past performance, e.g. in the form of an innovation. The sheer fact that a firm is in such a position does not seem to be worrying and does not warrant intervention. Second, in the case of a natural monopoly, it is cost inefficient to have more players in, so it is hard to see the justification of punishing efficiency.

Sliding scale

To cater to the various degrees of market power, in the U.S. the legal practice has developed a difference between 'a lot of market power' and 'a smaller amount of market power'. If the evidence suggests substantial market power then the courts have identified a certain set of practices that will condemn the defendant of illegal monopolization. If the evidence suggests lesser market power, then the courts tend to go for 'attempt to monopolize' which carries stricter conduct requirements[23]. In Europe such a 'sliding scale' of market power does not exist, at least not in a formal legal way. In the U.S. (sufficient) market power and abuse of market power are not treated separately. In Europe however there is a rather strict distinction between dominance and abuse of dominance. The advantage of the European approach is that it starts with a 'dominance test', which is relatively straightforward compared to abuse. If there is no dominance, there is no case. This creates clarity for firms within a relatively short time period. The disadvantage is that it creates a somewhat artificial split between a 'problem' area and a 'no-problem' area, largely based on a market share criterion.[24]

Dominance and abuse

[21] The bulk of empirical evidence reveals that one is most likely to find dominant firms under the larger ones (see Scherer and Ross (1990), Shepherd et al 2001 and many others).
[22] Except of course in merger cases where the creation of dominance is enough to block a merger.
[23] Hovenkamp (1994).
[24] In practice the discussion is not as black-white as suggested here. Antitrust authorities do look at other issues as well.

From economic theory we know however that there is not such a clear-cut split. It is not so difficult to envisage a heterogeneous goods market with high switching costs, minor innovative activity and large reputation effects, to fail the dominance test, but yet being potentially problematic, in a welfare sense.[25] At the other end of the spectrum, firms that are labeled 'dominant', face the restriction that certain types of behavior are almost per se forbidden. These types of behavior are not related to the seriousness of the effects of possible abuse, i.e. certain behavior that *might be abusive* is forbidden in a perhaps too mechanistic way. As a consequence, if there are competition authorities or regulators who have a tendency to over-regulate, labeling a firm as dominant gives opportunities to impose unnecessary restrictions.

The integrated approach in the U.S. gives more possibilities for taking the seriousness of effects into account. Yet, the U.S., in a response to fears that expansive applications of antitrust may reduce innovation, becomes more and more reluctant to pursue monopolization cases.[26] It is also a bit odd to be strict on preventing monopolization (under the assumption that monopolies are bad) and yet be relaxed about actual monopolies.

Concluding, the current E.U. system, while being practical, bears a risk of running into type I and II errors, i.e. some dominant firms may escape the attention while some welfare enhancing behavior by dominant firms may be punished. The U.S. system is not likely to produce type I many errors, but may be too lenient towards monopolization practices.[27]

A way forward?

Let us discuss an option that might improve the European situation. There are two problems. The first is that the dominance test relies too much on market shares. The second one is that possible abusive behavior is treated too mechanistically. A way to solve the first problem is to put more economics in the dominance test, which implies that less weight is put on market shares and more on other economic variables, in particular entry barriers. Competition authorities can have dominance cases with lower markets shares but high entry barriers and other problems. On the other side, market players with high market shares (say 60% or so) will have the opportunity to argue why despite their high market share they are not dominant. The disadvantage of that approach is that it is less predictable and that it may take more time. To tackle the second problem, also more economics should be put into the abuse of dominance. When a firm is labeled dominant, more economic analysis is needed to underpin the forbidding of certain types of behavior (see section 3.2). The reason is that many types of behavior that can be called abusive have plausible welfare enhancing interpretation as well. Think of price discrimination. It is not clear a priori whether or not price discrimination by a dominant firm is good or bad. A recent case in Europe 'Virgin/British Airways'[28] clarifies this point.

> On 9 January 1998 Virgin lodged a … complaint against BA's Performance Reward scheme (PRS), alleging that Virgin believes that the PRS: infringes Article 86;
>
> The Commission

[25] It is not clear though whether the competition law is the best way to deal with these types of markets, see Canoy and Onderstal (2003).
[26] See Fox.
[27] This point only holds for unregulated markets.
[28] IV/D-2/34.780 - Virgin/British Airways

> ‘criticised the PRS scheme (*Performance Reward System*: CRvD) for travel agents as being abusive of a dominant position.’[29]

While the Commission analyzed the scheme in length, it did not make an explicit attempt to show that the scheme was actually anti-competitive and that the effects were welfare reducing.

Putting more economics into the dominance test without doing the same with abuse, runs the risk of overregulation. Applying more economics into both creates a better balance between market and government failure and type I and type II errors are reduced.

3.2 Abuse of a dominant position and monopolization

As explained in section 2, for merger cases it is sufficient to demonstrate that a merger creates or strengthens a dominant position. For Article 82 cases it is not sufficient to demonstrate that a firm has a dominant position. In the words of the EC, abuse of a dominant position is defined as:

> ‘…anti-competitive business practices (including improper exploitation of customers or exclusion of competitors) which a dominant firm may use in order to maintain or increase its position in the market. Competition law prohibits such behaviour, as it damages true competition between firms, exploits consumers, and makes it unnecessary for the dominant undertaking to compete with other firms on merit. Article 82 of the EC Treaty lists some examples of abuse, namely unfair pricing, restriction of production output and imposing discriminatory or unnecessary terms in dealings with trading partners.’

The U.S. has a list in similar vein (sabotage, mergers, refusal to deal, tying, price discrimination, raising rival’s cost etc). This section tries to shed some economic light on a number of these potential abuses.

Firms with a dominant position can employ a wide range of strategies that fall under the heading of abuse. The strategies can be grouped in three categories. (i) Strategies aimed at deterring entry. The most common examples are strategic sources of barriers, such as preemptive and retaliatory action by incumbents, e.g. strategic price discounts, excess capacity and advertising. (ii) Strategies aimed at forcing exit of a rival. The most studies examples of pushing a rival out are foreclosure and predation. (iii) Strategies aimed at raising rival’s costs. Think e.g. of exclusive deals. Notice that the last two groups of strategies can also deter entry in addition to harm rivals.

There is a large literature on each group of strategies, including some general purpose articles such as Ordover and Saloner (1988). While much that has been said in Ordover and Saloner is still valid today, there are also a number of new developments in various areas. This section will focus on some of these new developments.

Before we do that, we reiterate that each of the strategies discussed is not an automatic abuse, or *should* not be an automatic abuse. Price cutting, advertising, vertical relationships etc are all part of normal business strategies. What has to be shown **economically** is that welfare is reduced by employing a certain strategy. Because welfare is not easily measurable, in particular since long run effects have to be taken into account as well, welfare does not

[29] Ibid. p12.

necessarily yield a practical **legal** tool to distinguish anti-competitive practices from normal business strategies. This difficulty even frustrated a Nobel price laureate:

> "Ronald [Coase] said he had gotten tired of antitrust because when the prices went up the judges said it was monopoly, when the prices went down they said it was predatory pricing, and when they stayed the same they said it was tacit collusion."
> --William Landes, "The Fire of Truth: A Remembrance of Law and Econ at Chicago", JLE (1981) p. 193.

We will come back to this question when discussing various anti-competitive practices.

3.2.1 Strategies aimed at deterring entry

Firms can abuse a dominant position (or indeed create a dominant position) by deterring entry. While the analysis of entry barriers is crucial for understanding the effectiveness and endurance of market power, it is not so easy to isolate entry deterring strategies as a single source of abuse. Many types of abuse, such as predation, are based on the notion that future entry is discouraged. In fact, it is often a condition to make abusive strategies lucrative. Eliminating a potential entrant or a rival today is of no use if there will be a fresh rival tomorrow. Still, there are some examples of (strategic) entry deterrence that can constitute an abuse by itself.

Strategic entry barriers
Strategic entry barriers are defined as incumbency actions that are designed to influence the behavior of potential rivals. They are effective if potential rivals look to current strategies as indications of future market conditions (Gilbert, Handbook). Examples of strategic entry barriers are strategic output expansion, preemptive innovation, shelving, excessive advertising or excessive product differentiation. These actions have in common that firms need to have market power to make it an effective strategy. How does such a strategy work? Take the example of shelving. It can pay off for a dominant firm to wait with the introduction of an innovation and "milk" his cash-generating established product, until entry is an immediate threat. The dominant firm has to be prepared to counter innovative entry immediately as it takes place, that is, he himself has to have the innovation "on the shelve". If entry indeed occurs, he puts his new product on the market to take away demand from the entrant.

This strategy, sometimes referred to as "shelving", is in its effect similar to predatory pricing. CPB (2000) provides an example in the Dutch consumer magazines market.[30] New magazines are often targeted at creating a new market segment. The launch can therefore be seen as an attempt to differentiate products. For a dominant firm, launching a new magazine can be less attractive if, in the face of stagnant advertising budgets and consumer demand for magazines, it dilutes its circulation and advertising revenues. However, if a new firm enters the market with a "new format" magazine, it may be rational for the established publisher to bring a similar magazine to the market and drive the rival out of the market.

In contrast to predatory pricing, "predatory product imitation" need not be based on charging a price that is lower than, in the extreme, the entrants' marginal cost. It is sufficient to launch the imitating and thus substituting product, charge the same price, and steal away demand from the new entrant to make entry unprofitable. In addition, there is also a long-run

[30] CPB (2000) Magazine publishing: a quiet life? The Dutch market for consumer magazines.

effect. The publisher can build a reputation for retaliating whenever an entrant attempts to establish a new magazine. The threat of retaliation may discourage potential future entrants.

As said above, it is quite rare to prove abuse of a dominant position without actual harming a rival. In *Berkey Photo* a monopolist's failure to disclose information about a new product was seen as anti-competitive. It is however, far from easy to prove a convincing case. However, some practices are easier to use to deter entry than to harm rivals. Rivals have invested in sunk costs and are less likely to divert assets to other areas (or even exit the market) than potential entrants. It follows that one is expected to find lots of possibilities of anti-competitive entry deterrence. Whether this also implies lots of legal cases is a different matter. Potential entrants have very bad track records as plaintiffs.[31] 'Most are denied standing. The practices are also generally subtle and hard to identify, and the public enforcement agencies are generally reluctant to spend vast amounts of money in litigating them.'[32]

Another example from the economic literature is 'banked advertising', i.e. firms engage in (large amounts of) advertising to scare off entrants (Pepsi and Coke comes to mind). In practice it turns out to be virtually impossible to distinguish anti-competitive advertising from normal advertising practices. This problem is endemic for strategic entry barriers and also holds for other types of strategies such as strategic product differentiation.

Concluding, while there seem to be ample possibilities for anti-competitive entry deterring strategies, filing suit against them as a single source of abuse is problematic.

3.2.2 Strategies aimed at forcing exit of a rival.

This category of abusive behavior is the most common, and the most studied in the economic and legal literature. Notice that the words 'forcing exit' are in fact a bit too extreme. Strategies that are aimed at 'hurting a rival', with exit as its ultimate consequence, is perhaps a more appropriate description. The reason why exit is not a sine qua non is that profits can be increased if one hurts a rival to the extent that it becomes a less effective rival. However, the strategies discussed in this section should not be confused with 'Raising Rival's Costs' as discussed below. Although the difference between the two types of strategies may not be that large, there is one clear distinction. Strategies that aim at forcing a rival out require upfront costs for the incumbent, while raising rival's costs does not.

There are two main types of forcing a rival out, predation and foreclosure. Other varieties such as price discrimination can best be grouped under predation, since discrimination is only anti-competitive if it is predatory in nature. Both on predation and foreclosure there is a bulky literature which we will not repeat here. Instead, we will point at some new developments in both areas.

Predation

The standard historical example of predatory pricing is Standard Oil, which attained a 90% market share in part through price warfare. While the Standard Oil case poked up the debate on predation, and many predation cases were won between 1940 and 1975, the debate was considerably cooled down after the publication of the Areeda-Turner article. The article which suggested a standard check on predation based on average variable costs, made so much impression on judges that plaintiffs were virtually empty handed ever since. Combined with the Areeda-Turner logic were two other developments, one economic and one legal. The economic development was the Chicago School logic which argued 'forcefully' that predation

[31] Hovenkamp (1994).
[32] Ibid, p281.

was not rational and therefore it did not make sense to make a lot of fuzz about it. The notion of irrationality of predation remains the dominant legal paradigm in the U.S. until today. The legal development was the famous Brooke case in 1993, which boiled down to a heavier burden of proof on the part of the plaintiff, because – unlike the earlier days of predation – the Supreme Court upheld the lower courts view that the plaintiff had to show that recoupment of predation losses was sufficiently likely.

As forwarded by Bolton, Brodley and Riordan, economic theory has moved considerably beyond the simplistic irrationality paradigm and also provides new strategic recoupment possibilities neglected in earlier economic theory. These new insights – if adopted by the judges as the current state of the art - could very well lead to a renewed interest in the subject.

Let us start by defining predatory pricing. Various causes can result in prices being 'too low'. Prices might be too low because firms want to attract customers, i.e. by an attempt to create a demand mass for a new or renewed product. On the other hand, low prices can also be the result from an attempt by the incumbent to force a rival out of the market. The incumbent opts for a short-term loss in order to make long-term extra profits thanks to a dominant position.

Predatory pricing implies that there is a price reduction which is profitable only because of the added market power the predator gains from eliminating, disciplining or otherwise inhibiting the competitive conduct of a rival or potential rival (Bolton et al., 2000). In the short term customers may benefit from lower prices, but over a longer period weakened competition will lead to higher prices, lower quality or less choice. The fact that an activity is being run at a loss, is not sufficient to establish a case of predatory pricing. The question is whether it has an anti-competitive effect. In order to prove the anti-competitive effect of predatory pricing, Bolton et al. (2000) propose a five-criteria rule:

1. a facilitating market structure,
2. a scheme of predation and supporting evidence,
3. probable recoupment,
4. price below cost and
5. the absence of efficiencies or business justification defense.

subnote 1) The market structure must make predation a feasible strategy. A company must have the power to raise prices (or to otherwise exploit consumers or suppliers) over some significant period of time (dominant firm or small group of jointly acting firms, entry and re-entry barriers).

subnote 2) Predation pricing and recoupment require that predation is plausible ex ante (i.e. based on prediction and extrapolation) and probable ex post (i.e. retrospectively). This means that there must be a predatory scheme ex ante under which the predator can expect to recoup its initial losses. Using the tools of applied game theory can help to identify economic conditions under which predation is rational profit-seeking conduct by a dominant firm. Ex post probability is shown by the subsequent exclusion of rivals and post-predation market conditions that make future recoupment likely.

subnote 3) At the very least, the losses incurred from a predation strategy must be recouped somehow. Should the operator be unable to recoup the losses, because of competition from existing or potential competitors, the predation strategy is not viable. Recoupment is only possible if there is an exclusionary effect on (potential) rivals, or through the disciplining of the rival's competitive conduct. The most common and straightforward recoupment occurs

when prices rise above the predatory market's competitive level in the predatory market. In more complex settings, recoupment can occur through other channels, e.g. by raising the prices of complementary or closely-related services. It is essential that these latter price increases should unambiguously be explained by the earlier predatory pricing (see also Cabral and Riordan 1997).

subnote 4) In the predatory period, prices should be below average variable cost, although also prices that which are also above average variable cost but below average total cost might be predatory and injure competition. The most- used cost standards are average total cost (ATC) and average variable cost (AVC) (OFT, 1999) or long-run average incremental cost (LRAIC) as a substitute for ATC and average avoidable cost as a substitute for AVC (Bolton et al., 2000). If prices are above ATC, there is no problem. If prices are below AVC, predation can be assumed. A price between ATC and AVC is either presumptively or conclusively legal. If the price is presumptively legal, there is a need for evidence that the operator intends to eliminate or to discipline a competitor.

subnote 5) Finally, there cases can arise where below-cost pricing by an dominant operator with dominance might be efficiency-enhancing rather than predatory. However, in such cases one has look very closely whether the efficiency enhancement is also to the benefit of the consumers in the long term. Otherwise the argument could be abused to foreclose a market on the grounds that it is 'efficient' to do so.

The five-criteria rule provides a clear procedure how to handle a potential predatory pricing case. However, predatory pricing might be hard to prove, particularly the recoupment aspect. Bolton et al (2002) provide new economic underpinning for predation to be rational and to distinguish it form normal business practices. To sort out the differences between the two they suggest to check whether there are indeed plausible efficiency gains as a result of the below cost pricing, whether there are alternative means to achieve those efficiency gains and whether the efficiency gains are materialized in e.g. higher quality (instead of just higher profits).

Bolton et al (2002) then continue to develop plausible ways in which predation can occur, using new insights from economic theory. We mention two examples.

- Financial predation

The argument here depends on capital market imperfections. Investors faced with moral hazard and selection problems, tend to favor large firms, at the expense of smaller ones. This incumbency advantage can be exploited. When start-ups need cash flow to pay back their debts, predators may have an easy target. Cutting prices reduce cash flow and the capital market imperfection stimulates predation. Bolton et al show how financial predation could be used in a recent cable TV case in Sacramento.

- Signaling and reputation

The predator can also lower its price in order to mislead the prey into believing that market conditions are unfavorable. The incumbent exploits it superior knowledge on cost and demand to deter entry or to eliminate a rival. Bolton et al illustrate this possibility by the old Bell case in 1879.

Bolton et al conclude by asserting that courts should use modern economic insight to assess the plausibility of predation strategies. However, their insights were not uncontested. Elzinga and Mills (2001) criticize Bolton et al for being too simplistic and too model specific. Without going into the details of this discussion (there was also a lengthy reply by Bolton et al.), we conclude the following.

- Predation can be rational in a variety of settings, and more than previously assumed (in particular by U.S. courts), mostly hinging on incomplete information arguments.
- It is not clear how serious predation is in practice. Ultimately this is an empirical question.
- Applying the five step procedure by Bolton et al seems a sensible thing to do, no matter how strong one feels on the applicability of economic theory or the empirical relevance of predation strategies.

When we look at the European practice, we observe a difference in views again. The U.S. law on predatory pricing has been reasonably clear at least since the Brooke Group v. Brown & Williamson case in 1993. There the Court held that to be found predatory, conduct must satisfy a two-part test: (i) the allegedly predatory price must be below an appropriate measure of cost, and (ii) there must be a dangerous probability that the alleged predator will be able to recoup its losses through monopoly prices once its rivals exit the market. The European Court of Justice has adopted the first part of the Brooke Group test, but has declined to adopt the second part, holding that recoupment is not a necessary element of predation under Article 82.[33] Recoupment seems an essential element of the test because cutting prices in order to increase business often is the very essence of competition."[34]

The marked difference in approaches between the U.S and the E.U. again reflects differences in the view on treating behavior of powerful firms (see further section 5). In addition to the recoupment debate there is a second difference. Whereas most U.S. courts have held that the appropriate measure of cost is average variable cost, the European Court of Justice left open the possibility of finding prices above average variable cost but below average total cost predatory if they are "part of a plan for eliminating a competitor."[35]

> The European Court has stated that where prices are below the average variable cost of production (variable costs are costs which vary with the amount of output produced), predation should be presumed. The Court held also that if prices are above average variable costs but below average total costs, conduct is to be regarded as predatory where it can be established that the purpose of the conduct was to eliminate a competitor. In these cases a key issue was whether the dominant undertakings were covering their costs, but evidence on the undertakings' intentions was also relevant. (OFT website)

The most recent advance in the literature on cost rules is Elhauge (2003)[36], who argued that recently, European and U.S. officials have made moves toward restricting firms from using above-cost price cuts to drive out entrants. The legal developments most likely reflect in itself legitimate critiques on cost-based tests of predatory pricing. Elhauge argues that costs should

[33] See Tetra Pak Rausing SA v. Comm'n, Case C-333/94P, [1996] ECR I-5951 (1996).
[34] See W. Kolasky, http://www.usdoj.gov/atr/public/speeches/11153.htm#N_17_
[35] AKZO Chemie BV v. Comm'n, Case C-62/86, [1991] ECR I-3359 (1991).
[36] Elhauge E. 'Why Above-Cost Price Cuts to Drive Out Entrants Do Not Signal Predation or Even Market Power - And the Implications for Defining Costs', Yale Law Journal, Vol. 112, No. 4, pp. 681-827, January 2003.

be defined in a pragmatic way, as a measure that assures that prices above 'costs' cannot deter or drive out equally efficient rivals. Elhauge shows that price cuts do not necessarily indicate an undesirable protection of market power, but rather can be an efficient response to deviations from a price discrimination schedule in competitive markets, and warns for harmful restrictions on reactive above-cost price cuts.

Concluding, while the U.S. practice could win from acknowledging the potential rationality of predation, quite the reverse, the European practice could win acknowledging the potential irrationality of setting low prices without the possibility of future recoupment.

Foreclosure

Another way of eliminating a rival is by foreclosing a market. The standard example is a vertically integrated firm with an upstream bottleneck facility and downstream competition. The downstream competitors need input from the upstream monopolist to do business. The integrated firm may have an incentive to provide the input on such unfavorable terms that it effectively forecloses the market. In a less extreme case we have an example of raising rival's costs here. The downstream competitor may not be eliminated but faces a competitive disadvantage. Think of telecommunications. An upstream incumbent owns the network and provides downstream services as well. Downstream competitors need the network to offer services. The incumbent can put its downstream competitors at a disadvantage by offering higher network access charges than it charges itself. The competitors may survive if the charge is not too high to run them out of business.

Rey and Tirole (1997) provide an overview on foreclosure. Besides the access example there are more forms of foreclosure. Firms can refuse to cooperate, grant exclusivity or price discriminate. Similar to other types of abuses, one needs incomplete information arguments to make foreclosure a rational strategy. In absence of informational asymmetries the Chicago school tells us that it is not obvious how an upstream monopolist could gain by foreclosing a (possibly profitable) downstream market.

The argument to backup rationality of foreclosure is not unlike the Coasian durable goods dilemma, in which a monopolist has an incentive to charge high prices early on to attract the customers with a high willingness to pay, but then wants to reduce price to attract less willing to pay but still profitable other customers. A dilemma exists when willing to pay customers anticipate a price drop. An upstream monopolist faces a similar commitment problem. It wants to make money on access, but it also want to protect its downstream profits. Each additional 'customer' adds to its access profits but also increase downstream competition.

There are several policy responses to foreclosure. Rey and Tirole mention: (i) structural policies (divestiture); (ii) access pricing; (iii) access quantity control; (iv) disclosure requirements and (v) so called 'common carrier policies'.

We will not repeat the pro's and con's of each of these responses in different settings, but the last type of policy requires further explanation. Suppose that 'upstream' and 'downstream' are not based on fundamental technological constraints but on historical coincidences. If an upstream monopolist is 'worse' (in terms of welfare) than a downstream monopolist (or vice versa), a policy option is to change the vertical structure of the market such that the 'best

monopoly variant' prevails. Such policies are called 'common carrier policies' by Rey and Tirole. An example of such a policy is the U.S. gas market reform.[37]

The broad implications of Rey and Tirole's analysis are:

- It does matter whether the competitive segment is upstream or downstream. Downstream monopolies are worse because they do not have the commitment problem described above. Henceforth, in absence of other counter forces, downstream monopolies will behave as textbook welfare reducers. Since the same does not apply to upstream monopolies, this has consequences for the effectiveness of the abovementioned common carrier policy: policy can ensure that consumers do not have to deal directly with a monopolist.
- Forbidding discrimination by an upstream monopolist can be counterproductive, since they bypass the commitment problem (upstream firms not being allowed to lower their prices to attract further customers).

Another area where foreclosure plays a role is in the adjacent markets literature. In contrast with the literature on direct market power, it is much less clear under which circumstances firms can inflict damages in adjacent markets.

Rey et al (2001) discuss adjacent market foreclosure. In many respect the adjacent markets situation resembles the discussion on conglomerate mergers. In both cases it should be clear that there are *a priori* less concerns about welfare reducing behavior. This is so because firms often have less ability as well as less incentive to foreclose adjacent market (or to leverage market power) than they would have in more direct situations. Firms have less ability because it is more complicated to foreclose an adjacent market, and –more importantly - they have less incentive because foreclosing adjacent markets is often costly. It can be costly because it can reduce business opportunities or reduce economies of scale and scope.

Nevertheless, there remain situations where welfare concerns are legitimate. Firms may leverage their market power to adjacent markets, if the adjacent markets are somehow related to the market in which the firm has market power. Think of Microsoft having market power in the operating systems market. It may use (or: may have used) this power to take control of the adjacent Browser market. It can leverage by refusals to deal, by making products incompatible, by denying access, etc.

From an economic point of view, it is important to focus the analysis on a whole market arena[38], i.e. including all relevant markets that are related. In the current practice of European competition law, the European Commission always starts a merger case or a case related to the abuse of a dominant position by delineating the relevant market. When assessing market performance on the relevant market, all markets that (strongly) influence behavior on the relevant market have to be taken into consideration in order to get a complete picture. For instance, the relevant scale of entry may not coincide with the relevant market. In some situations, a firm needs to enter several markets before being able to realize sufficient economies of scale. If too much emphasis is put on the relevant market, one may falsely conclude that entry barriers are low. The market arena consists of markets that are connected by important links, such as supply-side relationships (e.g., by operating both markets, firms can accomplish economies of scale or scope); demand-side relationships (e.g., a firm sells

[37] Before the reform, pipelines (the bottleneck) sold gas to customers (distribution companies, large industrial customers) and purchased their gas internally or from independent producers who had no direct access to customers. Since the reform, producers can purchase access from pipelines and intereact directly with customers. (Rey and Tirole, p18).

[38] Canoy & Onderstal (2003).

complementary goods, such as hardware and software); or vertical relationships, (a firm's conduct in the upstream market has influence on the performance of the downstream market).[39] Assessing possible abuse of a dominant position by leveraging is easier understood in a context of connected markets.

In which case is foreclosure by leveraging a profitable strategy for a dominant firm? In Whinston's (1990) paper[40] the dominant firm ties its product of market A (where it is dominant) to market B (where it is not dominant), so to make the firm more aggressive in market B and thereby scares off its rivals.[41] The most important insight in Rey et al (2001) is that foreclosing adjacent markets can protect monopoly profits on the 'home' market. Recent literature provides a synthesis of the older leveraging theories and the Chicago critique. The Chicago critique emphasizes that it does not make sense to extend monopoly power to adjacent markets, unless the adjacent market belongs to the home market, in which case it is misleading to call it adjacent. The new insights work from the hypothesis that the monopoly profits on the home market are somehow insecure, e.g. because there is a permanent threat of innovation. Think of software or pharmaceutical markets. The arguments are similar to the Coasian durable goods dilemma above, albeit in a different way. In the case of an upstream market monopolist, the durable goods dilemma makes that the upstream monopolist has *less* incentive to foreclose the downstream market. In the adjacent markets case, the durable goods dilemma can be *bypassed* by foreclosing the adjacent market.

Concluding, assessing foreclosure requires close inspection on the incentives by powerful firms. If powerful firms have the incentive and ability to foreclose a market, an attractive policy response is to change the market structure such that the incentives are lowered, e.g. by changing the vertical structure.

3.2.3 Strategies aimed at raising rival's costs

Raising the costs of a rival (RRC) has the advantage over the forcing strategies discussed above, in that it often requires less upfront costs by the dominant firm. A predator must incur substantial losses with uncertain future returns. A firm that succeeds in raising its rival's costs, often incurs less costs and may yield immediate returns. Clearly, also the legal rules govern RRC should differ from predation, since cost based rules and recoupment do not apply. Another interesting difference between strategies aimed at exit such as foreclosure and predation, and RRC is that the Chicago critique does apply to RRC. Clearly, if RRC is not costly then it must be rational, also in absence of incomplete information. Still, the differences between RRC and strategies aimed at exit should not be overstated, since RRC often requires firms to make costs as well[42]. Many antitrust violations can be interpreted as RRC, e.g. tying, bundling, exclusive dealing etc. In the legal practices it is often not explicitly addressed as such, although there are ample legal examples of condemning practices that raise rival's costs.[43]

The economic research to this line of strategies was initiated by Salop in a number of papers.[44] Salop and Scheffman identify a variety of RRC strategies, such as refusals to deal,

[39] The link should be rooted in the firm's business operations or in the market's demand side. Without this condition almost all markets are connected.
[40] Whinston, M. (1990), "Tying, Foreclosure, and Exclusion," American Economic Review, 80: 837-860.
[41] A similar argument can be made in an oligopoly context with the weaker result that price competition is relaxed.
[42] Coate and Kleite (1994)
[43] Hovenkamp (1994).
[44] Salop and Scheffman, AER 73-2 (1983), Krattenmaker and Salop AER 76 (1986). See also Krattenmaker, TG et SC Salop, (1996), Anticompetitive exclusion: raising rival's cost to achieve power over price, Yale Law Journal, 96:209-93.

advertising and R&D. Scheffman showed that RRC strategies may be much more widespread than initially thought and are not restricted to dominant firms.[45] Coate en Kleit (1994)[46], argue, on the other hand, that the transactions costs of RRC are often neglected in the literature and may well offset its benefits. The most straightforward example of RRC is refusal to deal. In the 1927 Kodak case, a monopoly manufacturer of camera firm attempted to integrate forward into retail. Accordingly, it refused to wholesale it supplies to other retailers.[47] The court ruled that Kodak leveraged its market power to the detriment of competitors, and repeated it in a later Kodak (1992) case. From these cases and the other legal practices in the U.S. one can infer that convincing RRC cases are rare. While the rationality of RRC is beyond discussion, the mechanisms are often subtle, much more subtle than refusal to deal. As a consequence, it turns out to be very hard to distinguish RRC form normal business practices.

The arguably most important RRC case was Microsoft, which might also have been discussed in the section on foreclosure or predation. In fact Microsoft was alleged to eliminate a competitor by a combination of predatory and cost raising actions. Obviously, space is too limited to repeat all the discussions on the Microsoft case here.[48] The case was interesting for many reasons. From an economist perspective it provides a good test for competition policy in the 'new economy' and it shows how thin the line is between anti-competitive behavior and normal business practices.

Microsoft has integrated Internet Explorer with Windows Explorer and made it part of the operating system Windows which it monopolizes. It has been alleged that, by not allowing competitors in the browser market, Microsoft is essentially providing a lower quality operating system when used with other browsers than when used with Internet Explorer. Even when Internet Explorer is not integrated in the operating system, the exclusive installation of it on a new computer by the manufacturer may increase the cost of a rival browser if there is some cost (or time or expertise) required for other browsers to be installed by the user.[49]

The first discussion point concerned the actual level of market power. Traditional tools point at Microsoft having monopoly power in the market for operating systems, but Microsoft (through Richard Schmalensee) argued that the relevant scale of competition is the one for platforms, not operating systems. Microsoft felt that traditional methods of calculating market shares feel short in high tech industries, where competition for the market was as important as competition on the market. In contrast to the government, Microsoft claimed that competition for the market, i.e. potential competition from innovators, was vigorous.

Although many economists would agree that network effects and entry barriers make that Microsoft has substantial market power, however measured, there is less agreement as to the question whether Microsoft has actually used this power to the detriment of consumers. The central role in answering this question is played by so-called Middleware. Obviously, a competitor to Microsoft's operating system cannot offer the full Office product line without incurring a prohibitively large amount of sunk costs. Middleware is written on top of Windows and does not suffer from this problem. A wide-scale adoption of middleware would imply that Microsoft cannot exploit its market power which it has from its operating system.

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[45] Scheffman The antitrust Bulletin Spring 1992.

[46] Coate M and Kleit (1994) 'Exclusion, Collusion, or Confusion?: The Underpinnings of Raising Rival's' Costs,", Research in Law and Economics, 16 (1994) 73-93.

[47] Eastman Kodak Co. vs. Southern Photo Materials Co.

[48] See e.g. John Hogan (2001), 'Competition Policy for Computer Software Markets' Journal of Information, Law and Technology, Economides IJIO 1999, Rey, Tirole and Seabright (2000). Richard J. Gilbert and Michael L. Katz February 2001 An Economist's Guide to U.S. v. Microsoft. Journal of Economic Perspectives 15, 25-44.

[49] Economides

Focusing on Microsofts potential RRC strategies, the government charged that Microsoft used contractual arrangements to exclude competitors. [50] An example of such a contractual arrangement is an arrangement between Microsoft and an Internet service provider (ISP), in which the ISP was granted favorable terms. In return the ISP agreed to deny its subscribers access to competing Browsers. The reason why subscribers buy such an 'unfavorable contract' is that there exists an external effect, i.e. individual buyers do not feel the reduction of competition effect, since their individual purchases contributes in a negligible way to that.[51] Clearly, without counter forces, such practices are harmful for consumers. What are the possible counter forces? There are potentially three counter forces. The first one is that Microsoft may have raised the cost of an inefficient rival, which could be welfare enhancing.[52] The second one is that exclusive deals can enhance efficiency. In particular in potential hold up situations, exclusive deals can increase relation specific investments. The third counter force is innovation. An exclusive arrangement with an Intern content provider can spur innovation since it can trigger complementary investments by those providers.[53]

Since theory provides ambiguous welfare consequences to exclusive deals, the antitrust authority has to verify the specific details of the Microsoft case to come to an assessment. The complication in the Microsoft case is that long run effects have to taken into account. The introduction to this chapter revealed the importance of long run effects in general, but in an innovation driven market, the long run effects are even more important than they are otherwise. The difficulties of making accurate long term predictions in the Microsoft case are (i) long term predictions in innovation driven markets are notoriously difficult; (ii) the theoretical linkages between competition and innovation and between innovation and welfare are ambiguous. Clearly, delving deeper into the details of the case reveals that there are a number of welfare enhancing features (free Browsers, single standard, some welfare enhancing innovation spurs) but also some welfare reductions (lack of choice, higher prices for Windows, reputation effects on aggressive conduct). How should one add these welfare effects? To quantify them is a tall order indeed, involves among other things weighing short term and long term effects and quantifying highly complex uncertainty issues. It is therefore unsurprising to find legal and economic scholars on both sides. Concluding, the Microsoft case neatly showed the difficulty of abuse of dominance (or monopolization) cases. Elements of subjective judgment will always play a part.

Reviewing the literature on RRC reveals similarities to the previous abuse cases. There are lots of convincing economic examples of profitable ways of RRC, as they are of predation or foreclosure. New economic insights reveal an enlarged set of possibilities for a firm to profitably raise its rival's costs. Yet, the mechanisms are often rather subtle and cannot be easily distinguished from normal business practices. Therefore, the legal successes of abuse cases based on RRC are modest.

3.3 Conclusions

There is one fundamental difference between EU and US approaches towards monopolization. While competition authorities at both sides of the ocean are concerned with anti-competitive practices by firms with large market power, the U.S. is mainly concerned with preventing a market structure where such practices are likely, while the E.U. also fights the practices per se.

[50] US vs Microsoft 1998, para 75-102.
[51] Rasmussen, Ramseyer and Wiley, 1991, Segal and Whinston, 2000.Naked Exclusion: Comment AER.
[52] See e.g. Boone (2003).
[53] Indeed, Judge Jackson concluded that these types of arrangements were not anti-competitive.

The main forms of abuse are grouped in three categories: (i) Strategies aimed at deterring entry. The most common examples are strategic sources of barriers, such as preemptive and retaliatory action by incumbents; (ii) strategies aimed at forcing exit of a rival, with the main examples foreclosure and predation; (iii) strategies aimed at raising rival's costs, e.g. of exclusive deals.

All categories share the fact that it is hard to distinguish anti-competitive strategies from normal business strategies. Since intervention in abuse cases is associated with social costs as well (time, government failure), some caution is needed. On the other hand, anti-competitive practices such a predatory pricing can be socially very costly, also in the long run.

4. Dominance through collusion[54]

Even when no single firm enjoys a dominant position, firms may collectively exert a market power similar to that of a dominant firm. This will in particular be the case when firms coordinate their decision through some form of collusion.

There is a rather general consensus – at least in practice – that naked collusion, be it in the form of horizontal price –fixing or market-sharing agreements, should be forbidden.[55] Unfortunately, it does not suffice to "forbid" collusion, since it can be "implicit" rather than "explicit". Explicit collusion, where firms engage in written or oral agreements, organise meetings to design and implement collusive mechanisms, and so forth, are indeed caught by Article 81 in the EU and by Section 1 of the Sherman Act in the US – provided that the appropriate evidence is recovered. But implicit collusion does not involve any explicit agreement; it arises instead from the mere repetition of competitive interactions. In the EU, the concept of collective dominance provides however a basis for antitrust intervention in such cases; similarly, in the US collusion is accounted for through the concept of "coordinated effects" in the context of merger control.

This section discusses the scope for antitrust intervention against such tacit collusion. We first study the circumstances in which collusion can arise, and the forms it can take, before discussing the alternative courses of action available to competition authorities.

4.1 Relevant factors for tacit collusion

[54] This section borrows from joint work with M. Ivaldi, B. Jullien, P. Seabright and J. Tirole – see for example Ivaldi *et al.* (2003).

[55] Selten (1984) points out that tough price competition may discourage entry; fighting collusion may thus "backfire" by reducing the number of market participants – a similar observation applies to investments and other endogenous sunk costs, as emphasized by Sutton (1991, 1998). As noted by D'Aspremont and Motta (1994), intensifying competition however selects the most efficient competitors.
Using a panel of UK manufacturing industries, Symeonidis (1999) finds that the UK cartel laws from the late 50's triggered tougher price competition and had a strong effect on the structure of previously cartelized markets, but little impact on firms' profits.

The logic of tacit collusion

Tacit collusion may arise when the same firms repeatedly compete in the same markets. A firm may then have an incentive to maintain high prices if it expects that if it does not do so, the rivals will lower their own prices in the future. Whether firms can in fact maintain high prices depends on four main factors:

- *How much each firm gains from undercutting its rivals.*

Tacit collusion is clearly easier to sustain when the gains from undercutting are low. This puts limits on the level of collusive prices that can be sustained, since the gains from undercutting depend among other things on the price-cost margin and the elasticity of the firm demand.[56] The degree of product differentiation may thus matter, as well as the nature of competition – for example, the benefits from undercutting are typically smaller when firms compete in quantities than when they compete in prices.

- *How much such a firm would lose in the future if its rivals retaliate*

The long-term profit loss from a deviation is the difference between the long-run collusive profit that the firm would obtain by sticking to collusion, and the long-run profit it obtains under the market conditions that may prevail if undercutting occurs. The reaction of firms to perceived undercutting of the collusive price is often referred to as "retaliation", although it needs not always take the form of aggressive actions against the firm.
Indeed, a simple form of retaliation consists in the breakdown of collusion and the restoration of "normal" competition and profits. Firms then anticipate that collusive prices will be maintained as long as none of them deviates, but if one attempts to reap short-term profits by undercutting prices, there will be no more collusion in the future, at least for some time. Firms may then abide to the current collusive prices in order to keep the collusion going, in which case collusion is self-sustaining. This form of collusion has a simple interpretation: firms trust each other to maintain collusive prices; but if one of them deviates, trust vanishes and all firms start acting in their short-term interest.
However, more sophisticated forms of retaliation may inflict tougher punishments and thereby allow sustaining higher collusive prices. For example, retaliation may include temporary price wars, leading to profits below "normal" levels for some period of time.[57] It may also include actions that are specifically targeted at reducing the profits of the deviant firm[58]. Alternatively, firms may refuse to cooperate on other joint policies (such as joint ventures or joint distribution arrangements) or in standard setting processes. The retaliatory power of rivals thus depends on market specificity, and determines to a large extent the ability of all parties to maintain tacit collusion.

- *How likely is undercutting by the firm to lead to such retaliation*

[56] At a given demand level, the benefits from a small price cut increase as the price-cost margin or the own-price elasticity of demand increase.
[57] See for instance the work of Porter (1983) on the Joint Executive Committee for the rail-roads industry in the 1880s.
[58] For example, in *Compagnie Maritime Belge* (case C-395/96P) shipping companies were alleged to charter "fighting ships" specifically designed to compete head to head against the ships of a targeted company.

Clearly, if there is little chance that undercutting triggers retaliation, the fear of losing the collusive profit will be an ineffective deterrent. The probability that undercutting by one firm triggers retaliation depends mostly on firms' ability to monitor each other's behaviour, and thus on market transparency. The extent of publicly available information on prices and quantities is thus highly relevant, but other dimensions such as market stability (demand and cost volatility, frequency of innovation and so forth) or the degree of similarity in cost and demand conditions matter as well.

- *How much the firm discounts future profit losses relative to today's gains*[59]

If firms care mostly about current profits, they tend to focus on the short-term and thus "ignore" the consequences of retaliation. They thus have a strong incentive to undercut and collusion is uneasy to sustain. The relative weight of current and future profits in the firm's objectives depends among other things on the market real interest rate. Future profits matter more with low interest rates, which facilitates collusion. Another key determinant is the delay before competitors react, which depends on monitoring and structural factors such as adjustment costs, long-term contractual arrangements, and so forth.

These four factors, which determine the sustainability of tacit collusion, in turn depend on market characteristics, which can be grouped into three categories. The first category includes necessary ingredients for collusion. The second category covers important characteristics that determine whether collusion can be sustained. The last category corresponds to characteristics that are relevant, although to a lesser extent.

Necessary ingredients

Some characteristics have a decisive impact on the firms' ability to sustain tacit collusion. These include *entry barriers*, the *frequency of interaction* and the role of *innovation*:

- *Entry barriers: collusion cannot be sustained in the absence of entry barriers and it is more difficult to sustain, the lower the entry barriers.* In the absence of entry barriers any attempt to maintain supra-competitive prices would trigger entry (e.g., short-term or "hit-and-run" entry strategies), which would erode the profitability of collusion. In addition, the prospect of future entry tends to reduce the scope for retaliation, since firms have less to lose from future retaliation if entry occurs anyway.

- *The frequency of interaction: frequent interaction and frequent price adjustments facilitate collusion.* As already noted, firms could not tacitly collude if they did not anticipate interacting again in the future. Similarly, collusion is unlikely when firms interact only infrequently, since the short-term gains from undercutting a collusive price could then be "punished" only in a far future.[60] Collusion is instead easier when firms interact more frequently, since they can then react more quickly to deviations and retaliation can thus come sooner.[61]

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[59] A discount rate R means that the firm weights the profits in period T with a multiplicative discount factor $\delta = 1/(1+R)^T$. If the firm faces no risk and can freely access the credit market, the discount rate corresponds to the market interest rate.

[60] Of course, other industry characteristics such as market transparency, which is discussed below, also affect the length of time before retaliation effectively occurs. But the point here is that retaliation will not even be feasible in the absence of frequent interaction.

[61] A similar idea applies to the frequency of price adjustments, since retaliation can come sooner when prices adjust more frequently. Thus, the more frequent price adjustments are, the easier it is to sustain collusion.

Innovation: collusion is easier to sustain in mature markets where innovation plays little role than in innovation-driven markets. The reason is that innovation, particularly if it is drastic, may allow one firm to gain a significant advantage over its rivals. This prospect reduces both the value of future collusion and the amount of harm that rivals will be able to inflict if the need arises. If for example the probability of drastic innovation is substantial, the incumbents anticipate that their market position is short-lived; they thus put less emphasis on future retaliation and are more tempted to cheat on collusion.

Clearly, there is little scope of collusion in the absence of entry barriers, or if firms interact very infrequently, or else in innovation-driven markets. Therefore, whenever an industry presents one of these features, collusion is unlikely to constitute a significant concern. In practice, unfortunately, many industries may not be so clearly exempted. It is therefore useful to consider now the key factors that may affect the scope for collusion. In addition, in the context of merger control, the above industry features are less likely than others to be affected by a proposed merger; it is therefore also useful to see how a merger may affect these key factors.

Key factors

The second group of market characteristics includes key determinants of the scope for collusion. These factors include of course the *number of market participants*, but also the degree of *symmetry* among those participants, the existence of *maverick firms*, of *structural links* or of *cooperative agreements*.

- *Number of participants: Collusion is more difficult when there are more competitors.* For one thing, coordination is more difficult, the larger the number of parties involved, in particular when coordination is only based on a tacit common understanding of the collusive market conducts. For example, identifying a "focal point" in terms of prices and market shares becomes less and less obvious, particularly when firms are not symmetric.[62]
There is another reason that makes it difficult to collude with many competitors. Since firms must share the collusive profit, as the number of firms increases each firm gets a lower share of the pie. This has two implications. First, the gain from deviating increases for each firm since, by undercutting the collusive price, a firm can steal market shares from all its competitors; that is, having a smaller share each firm would gain more from capturing the entire market. Second, for each firm the long-term benefit of maintaining collusion is reduced, precisely because it gets a smaller share of the collusive profit. Thus the short-run gain from deviation increases, while at the same time the long-run benefit of maintaining collusion is reduced. It is thus more difficult to prevent firms from deviating.[63] This impact of the number of competitors is likely to be particularly important when there are few competitors.[64]

[62] The idea that coordination is more difficult in larger groups is intuitive but there is little economic literature on this issue. See for example Compte and Jehiel (2001).
[63] This insight is valid when holding all other factors constant. The number of firms is however endogenous and reflects other structural factors such as barriers to entry and product differentiation.
[64] For example, in the case of an oligopolistic industry where *n* identical firms produce the same good, it can be shown that collusion is sustainable when the discount factor of the firms lies above a threshold equal to 1 – 1/n. This threshold increases by 33% (from 1/2 to 2/3) when adding a third competitor to a duopoly, whereas it increases by only 12,5% (from 2/3 to 3/4) when adding a fourth competitor.

- *Symmetry*: it is easier to collude among equals, that is, among firms that have similar cost structures, similar production capacities, or offer similar ranges of products. Suppose for example that firms have different marginal costs. The presence of such cost asymmetry has several implications.[65] First, firms may find it difficult to agree to a common pricing policy, since firms with a lower marginal cost will insist in lower prices than what the other firms would wish to sustain.[66] More generally, the diversity of cost structures may rule out "focal points" for pricing policies and so exacerbate coordination problems. In addition, technical efficiency would require allocating market share to low-cost firms, but this would clearly be difficult to sustain in the absence of explicit agreements and side-transfers.[67]

Second, even if firms agree on a given collusive price, low-cost firms will be more difficult to discipline, both because they might gain more from undercutting their rivals and because they have less to fear from a possible retaliation from high-cost firms.[68] Retaliation is indeed less effective when exerted by an inefficient firm against an efficient one, since the ability of the former to compete against the latter is limited.

A similar reasoning applies when one firm has a superior product quality, since such a firm has less to fear from retaliation. The argument also extends to other types of cost differences, such as asymmetric production capacities. Capacity constraints potentially affect the sustainability of collusion in two ways. They limit the gain from undercutting rivals but also limit firms' retaliatory power. At first glance, capacity constraints may thus appear to have an ambiguous effect on collusion, since they reduce both the incentives to deviate and the ability to punish such deviations. And indeed, studies that have focused on symmetric capacities[69] have confirmed this apparent ambiguity.[70] The impact of asymmetric capacities is however less ambiguous since, compared with a situation where all firms would face the same capacity constraints, increasing the capacity of one firm at the expense of the others both increases the first firm's incentive to undercut the others and limits these other firms' retaliatory power. Overall, therefore, introducing such asymmetry hinders collusion.[71]

The most effective collusive conducts usually involve asymmetric market shares, reflecting firms' costs or capacities;[72] thus, while market shares are highly endogenous variables, *market*

[65] See Bain (1948) for an early discussion. Gertner (1994) validates this insight for environments with "immediate responses" where collusion is otherwise straightforward to achieve through simple price-matching strategies, even in the absence of repeated interaction.
[66] It is for example well-known that the monopoly price is an increasing function of the industry's marginal cost.
[67] Side-transfers need not be monetary, however. They may for example consist of in-kind compensations or, when the same firms are active in several markets, of concessions made in one of these other markets. Still, such collusion schemes are not very plausible in the absence of any explicit agreement, and thus go beyond the scope of this report. For a discussion of these issues, see Osborne and Pitchik (1983) and Schmalensee (1987).
[68] Mason, Phillips and Nowell (1992) note in experimental duopoly games that cooperation is more likely when players face symmetric production costs.
[69] See e.g. Abreu (1986) for a symmetric Cournot context and Brock and Sheinkman (1985) for a first analysis of a symmetric Bertrand context, later extended by Lambson (1987).
[70] Brock and Scheinkman (1985) show for example in a linear model that, with exogenously given symmetric capacity constraints, the highest sustainable per capita profit varies non-monotonically with the number of firms.
[71] This insight had been hinted at by several studies: Lambson (1994) provides a first partial characterisation of optimal collusion schemes in this context. Lambson (1996) shows further that introducing a slight asymmetry in capacities hinders tacit collusion; and Davidson and Deneckere (1984), (1990) and Pénard (1997) show that asymmetric capacities make collusion more difficult in duopolies, using particular forms of collusive strategies. This insight has recently been formally confirmed by Compte *et al*. (2002), who show that asymmetric capacities make indeed collusion more difficult to sustain when the aggregate capacity is itself quite limited.
[72] A more efficient firm will be more willing to collude if it gets a larger share of the collusive profits, but this also affects the incentives of the less efficient firms. There is thus a limit to the possible reallocation of market

share asymmetry may provide indirect evidence of a more profound asymmetry that tends to hinder collusion.

The intuition that "it is easier to collude among equals" also explains the role of so-called "*mavericks*." A maverick firm can be interpreted as a firm with a drastically different cost structure, which is thus unwilling to participate to a collusive action.[73] Consider for example a firm that has a drastically different cost structure, production capacity, or that is affected by different factors than the other market participants.[74] Very often such a firm will exhibit a market conduct that differs from others, reflecting its different supply conditions. This firm may then be unwilling to be part to a collusive conduct or might be willing to do so only under terms that would not be acceptable or sustainable for the other firms. Similarly, a firm may have a stronger preference for the short-term and be therefore more tempted to undercut the rivals.[75]

- *Structural links* can facilitate collusion among firms. For example, cross-ownership reduces the gains derived from undercutting the other firm. Joint venture agreements can also enlarge the scope for retaliation – a firm can then for example punish a deviating partner by investing less in the venture.[76] For these reasons, collusion is more likely to appear in markets where competitors are tied through structural links.

In the absence of structural links, simple *cooperation agreements* can also contribute to foster collusion. As in the case of joint ventures, these cooperation agreements can for example enlarge the scope for retaliation, thereby enhancing the ability to punish deviating partners. This may be particularly relevant for industries such as the telecommunications industry, where competitors need to reach interconnection agreements in order to offer good services. These agreements not only enlarge the scope for retaliation, they also have a direct impact on the operators' pricing strategies. Competitors may then design these interconnection agreements so as to facilitate collusion.

More generally, firms may alter their contractual agreements, either between themselves or with third parties, so as to facilitate collusion. Marketing agreements can constitute good tools to that effect. Jullien and Rey (2002) show for example that producers of consumer goods can resort to Resale Price Maintenance to impose more uniform prices across local retail markets, thereby making it easier to detect deviations from a collusive price. Record companies have been accused to market their disks according to simple pricing grids (with only a few categories, instead of personalised prices for each author or composition) for a similar purpose.

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shares and, while this may help collusion, it does not in general restore the same collusive possibilities as if firms were equally efficient. The same remark applies to asymmetric capacities: Compte et al. show that giving larger market shares to the larger firms alleviates somewhat the tension generated by the asymmetry, but it does not evacuate it entirely, so that the scope for collusion is nonetheless reduced

[73] A new entrant can also appear to destabilize a pre-entry collusive during a transition period, until a new collusive situation is reached. This is a rather different scenario, where the temporary absence of collusion simply reflects a tâtonnement process for reaching a new focal point.

[74] A firm that uses a different production technique than others will be affected by the price of different inputs, or the labour cost may fluctuate in a different manner.

[75] See Harrington (1989) for an analysis of collusion between firms that have different discount factors.

[76] Martin (1995) provides a detailed analysis of this issue.

Other relevant factors

Other factors can have an influence on the sustainability of collusion, although possibly to a lesser extent or in a more ambiguous way. Among these, the degree of market transparency appears to be a key factor. Other factors include product differentiation, the characteristics of demand (demand trend and fluctuations, as well as demand elasticity and buying power), multi-market contact, club effects or the organisation of particular markets such as bidding markets. These dimensions are relevant to assess the plausibility of collusion, particularly when the factors of the first two groups do not suffice to send a clear signal.

- *Market transparency*: collusion is easier when firms observe each other's prices and quantities. Frequent price adjustments give firms the physical possibility to quickly retaliate when one market participant undercuts the others, but such deviation must first be identified by the other participants. As a result, collusion can be difficult to sustain when individual prices are not readily observable and cannot be easily inferred from readily available market data. This, in turn, supposes that some uncertainty affects the market: otherwise any deviation would be detected by the rivals, who would perceive a reduction in their market share.
This observability problem has first been stressed by Stigler (1964)'s classic paper, and formally analysed by Green and Porter (1984) and Abreu, Pearce and Stachetti (1985): t*he lack of transparency on prices and sales does not necessarily prevent collusion completely, but makes it both more difficult to sustain and more limited in scope.*

What matters here, however, is not what is directly observed by the firms, but what information firms can *infer* from the available market data. For example, inferring deviations from collusive conduct is easier and requires less market data[77] when the market is stable rather than unstable. Moreover the delay necessary to obtain reliable data on prices and quantities matters, as well as its nature. For example, professional associations sometimes publish information on prices, productions or capacity utilisation rates. It first matters whether this information is about aggregate or individual data, since in the latter case it is easier to identify a deviant firm.[78] The time lag elapsed between the pricing period and the publication period is also important. Even detailed information may not help to sustain collusion if it is available only after a long delay.

- *Demand growth*: collusion is easier to sustain in growing markets, where today's profits are small compared with tomorrow's ones. Conversely, collusion is more difficult to sustain in declining markets, where tomorrow's profits (with or without retaliation) will be small anyway – in the limiting case where the market is on the verge of collapsing, there is almost no "future" and therefore no possibility to induce firms to abide to a collusive conduct.

- *Business cycles and demand fluctuations* hinder collusion. This is a corollary of the above impact of demand growth or decline. The idea, formally captured by Rotenberg and Saloner (1986) and Haltiwanger and Harrington (1991), is that when the market is at a peak, short-term gains from a deviation are maximal while the potential cost of retaliation is at a minimum. Hence, collusion is more difficult to sustain in those times.
To see this, suppose that demand fluctuates from one period to another and, to fix ideas, assume for the moment that demand shocks are independent and identically distributed across

[77] For example, in the above hypothetical industry, in the absence of any demand shock firms could perfectly detect any deviation by their rivals by simply looking at their own sales.
[78] See for example Kühn (2001).

periods. In this hypothetical scenario, firms know that they face an uncertain future, but in each period the prospects are the same; the probability of benefiting from a good shock is for example the same in each future period, and likewise for the probability of bad shocks. This in turn implies that the amount of future retaliation to which a firm exposes itself in each period, remains the same over time. However, in periods where demand is higher than average, the short-term benefits from a deviation are themselves higher than average. Therefore, in such a period, the firm must trade-off higher-than-average gains from deviation against a constant (and thus "average") level of punishment. Clearly, deviations are more tempting in such period and, by the same token, collusion is more difficult to sustain than in the absence of demand fluctuations, where both the short-term gains from deviations and retaliation possibility would always remain at an average level.
As fluctuations gain in scale, collusion becomes more and more difficult to sustain, at least in those states where demand is especially high. Firms are then obliged to collude "less" (by lowering the collusive price) or even abandon any collusion when demand is high. A similar analysis applies to more deterministic fluctuations, as for example in the case of seasonal or business cycles. There again, undercutting rivals is more tempting when demand is high, and the perceived cost of future price wars is lower when the cycle is currently at its top, since retaliation will only occur later, thus in periods of lower demand.

- *Product differentiation*: this factor can have a more ambiguous impact on collusion, since it affects both the incentives to undercut the rivals and their ability to retaliate. This is particularly the case when product differentiation consists of offering different combinations of characteristics, possibly at comparable prices but targeted at different types of customers; this corresponds to what economists refer to as "horizontal differentiation". Such differentiation aims at segmenting customers, in order to gaining market power over specific segments by creating customer loyalty: a customer may then be reluctant to switch away from a favourite brand, even if s/he would benefit from a small price reduction by turning to an alternative brand. This segmentation strategy affects the scope for collusion in two ways. First, it limits the short-term gains from undercutting rivals, since it becomes more difficult to attract their customers. Second, it also limits the severity of price wars and thus the firms' ability to punish a potential deviation. Overall, therefore, the impact of horizontal differentiation appears quite ambiguous.

Indeed, the economic work on this issue has shown that collusion may become easier or more difficult, depending on the exact nature of the competitive situation (e.g., competition in prices versus competition in quantity).[79] Raith (1996) notes however that *product differentiation may exacerbate informational problems in non-transparent markets*. That is, even if firms do not observe their rivals' prices or quantities, they may still be able to infer the relevant information from their own prices and quantities. But such inference may be easier to achieve when all firms offer the same goods than when they offer highly differentiated products. This may be one reason why antitrust authorities usually interpret product homogeneity as facilitating collusion.[80]

It is often perceived that low *demand elasticity* should exacerbate collusion concerns. The elasticity of the demand has in fact no clear impact on the *sustainability* of collusive prices.

[79] See for example Ross (1992) and Martin (1993).
[80] Product differentiation also hurts collusion when one firm has a "better product" than the others (what economists refer to as "vertical differentiation"). In essence, the analysis is then similar to that of asymmetric costs. A firm that has a better quality (possibly adjusted for the cost) is in a situation somewhat reminiscent to that of a firm that would offer the same quality as the others, but at a lower cost.

For example, in the case of an oligopolistic industry where *n* identical firms produce the same good and repeatedly face the same demand, collusion is sustainable when the discount factor of the firms lies above a threshold equal to 1 – 1/n whatever the shape of the demand, which is therefore irrelevant. This comes from the fact that demand elasticity (and more generally, the shape of consumer demand) affects in the same way both the short-term gains from undercutting rivals and the long-term cost of foregoing future collusion.

Collusion is however more profitable when demand elasticity is low. When picking a collusive price, the firms must trade-off the increased margins generated by higher prices with the reduction in sales that these higher prices would trigger. The industry's ideal collusive price is the monopoly price, p^M, which maximises the joint profit of the firms and is higher when the demand elasticity is lower.[81] *Therefore, for a given market size, the firms have more to gain from sustaining the monopoly price when demand elasticity is low.* In that sense, demand elasticity may constitute a relevant factor, although of a different nature than the factors listed above.[82] In addition, collusion is a larger concern for consumers when demand is inelastic than when it is elastic. This is both because the potential for a large profitable increase in prices above the "normal" level decreases when demand becomes less elastic, and because consumers are hurt more by a given price increase when they have little alternatives.[83]

A related factor concerns the countervailing *buying power* of the customers. If buyers are powerful, even a complete monopolist may find it difficult to impose high prices. The profitability of collusion is similarly reduced. In addition, Snyder (1996) note that large buyers can successfully break collusion by concentrating their orders, in order to make firms' interaction less frequent and to increase the short-term gains from undercutting rivals; more generally, large buyers can design procurement schemes that reduce the scope for collusion.

Multi-market contact: it is well recognised that firms can sustain collusion more easily when they are present on several markets.[84] First, multi-market contact increases the frequency of the interaction between the firms. Second, it may allow softening asymmetries that arise in individual markets. For example, one firm may have a competitive advantage in one market and its rival can have its own competitive advantage in another market. While a market-level analysis may then suggest that collusion is difficult to sustain, multi-market contact restores in such a case an overall symmetry that facilitates collusion. Third, multi-market contact may allow the firms to sustain collusion in markets where the industry characteristics alone would not allow such collusion.[85]

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[81] More precisely, the monopoly price is such that the Lerner index is inversely proportional to the demand elasticity: $L = (p-c)/p = 1/\varepsilon(p)$, where the elasticity is given by $\varepsilon(p) = pD'(p)/D(p)$.

[82] The profitability of collusion can in turn influence the firms' willingness to design and implement practices that facilitate the implementation of a collusive action. It can also induce firms to engage in more explicit collusion, at the risk of being caught by antitrust enforcement.

[83] The potential harm to consumers is thus the larger, the less elastic is the demand. The impact on total welfare, however, is more ambiguous. The reason is that price increases generate less distortions when demand is inelastic (see e.g. Tirole (1988) for a discussion of this issue).

[84] The classic reference is Bernheim and Whinston (1990). See also Parker and Röller (1997) and Evans and Kessides (1994) for empirical evidence ;

[85] Suppose that two firms compete in one market and face one more competitor in another market. The firms could sustain collusion in the first market if their discount factor is higher than 1/2, but could not a priori collude in the second market if their discount factor is below 2/3. Yet, they can actually sustain collusion in both markets if their discount factor is close enough to 2/3, by giving a higher market share to the competitor in the second market, in order to induce that competitor to collude, and using the first market to discipline themselves.

The principles reviewed above apply as well to *bidding markets*. For example, collusion is easier when there are fewer bidders that repeatedly participate in the same bidding markets, when the frequency of these markets is high (e.g., daily markets), and so forth. In addition, however, bidding markets can be designed in ways that either hinder or facilitate collusion. For example, sealed bid auctions generate less information (that is, except if the auctioneer reveals the details of all the bids afterwards) than public descending procurement auctions, where sellers observe at each moment who is still bidding at the current price. Therefore, a close look at the organisation of the bidding markets may be necessary to assess the likelihood of collusion.[86]

Some markets are subject to *club or network effects*, where consumers benefit from being in the same "club" by using the same software or the same keyboard layout, subscribing to the same operator, and so forth.[87] Club effects have several implications. They tilt the market in favour of a single participant, thereby creating a "winner-take-all" type of competition which is not prone to collusion. In addition, club effects create lock-ins effects that reinforce the position of the market leader and thus increase the benefits derived from such a position. By undercutting its rivals a firm can trigger snow-balling effects that could easily tilt the market in its favour and thus obtain a durable leadership position. Club effects therefore exacerbate the gains from undercutting the rivals and, at the same time, lock-in effects limit retaliation possibilities. Both factors contribute to make collusion less likely.

Remark: Collusion in other dimensions than prices. The above discussion applies as well to other forms of competition. Where for example firms compete in quantity or production capacity, collusion consists in reducing the production levels below competitive levels and retaliation can either take the simple form of reverting to "normal" competition, with higher output levels, or involve temporary large increases of competitors' outputs, in order to further depress prices punish the deviating firm. While the nature of competition is different and often less intense under quantity competition than under price competition, it does not follow that the scope for collusion is larger or smaller, since retaliation possibilities are affected as well as the short-run gains of deviations from collusion: increasing one's production level is less profitable, since prices will adjust to sell out the competitors' output, but at the same time, retaliation is somewhat more difficult since the firm can always adapt its output level.

4.2 What can competition authorities do?

The above analysis underlines relevant factors but does not allow concluding when or whether collusion actually takes place. For one thing, there is a multiplicity of equilibrium issue. In particular, even if collusion is indeed sustainable, firms may well end-up "competing" in each

[86] See e.g. Klemperer (2002).

[87] One important issue concerns the « compatibility » of rival clubs or networks. Club effects are fully internalised – and thus become irrelevant – when rival networks are fully compatible. This is for example the case in the telecommunications industry, where all operators are interconnected, so that subscribing to one or the other network does not affect who someone can communicate with. However, compatibility can be imperfect (e.g., some services can be proprietary) and pricing policies can also induce indirect club effects (for example, when it is cheaper to call subscribers of the same operator).

and every period as if it was the last.[88] While there is a good understanding of the factors that facilitate collusion, this is not so for the conditions under which coordination emerges.[89]

Even assessing the likelihood of collusion is tricky. As we have seen, the sustainability of tacit collusion depends on many factors – and only some of them can be quantified with a reasonable degree of precision. In addition, these factors may go in opposite direction in a given industry.

That being said, how what can antitrust fight collusion? There are several possible courses of action.

- *Ex ante*, competition authorities can prevent the emergence of an industry structure that is prone to collusion, by taking into account this concern when examining proposed mergers or joint venture agreements. They can also ban facilitating practices.

- *Ex post*, competition authorities can take steps to fight collusion *per se*, e.g., by uncovering evidence of explicit coordination or by attacking specific agreements that again facilitate collusion.

We discuss these approaches in turn.

Merger control

As mentioned, a given market situation can generate multiple equilibria. It is thus impossible to rely on theory alone to determine whether collusion is *actually* taking place. While the analysis of the history of the industry may help determine whether collusion occurred in the past, it provides limited help for evaluating whether it will occur in the future, and even more so if a merger takes place.[90]

Thus, it will not be possible to reach a definite conclusion from available market data on whether tacit collusion will actually occur as a consequence of the merger or not. The merger control office can however address a different and yet relevant question: will the merger create a situation where collusion becomes more likely, that is, will collusion significantly be easier to sustain in the post-merger situation?

A merger often affects many of the factors that are relevant for the sustainability of collusion and it can affect them in ways that tend to off-set each other. The impact of the merger on collusion can thus involve a difficult assessment of possibly conflicting effects. Ideally, this could be done by building a "meta-model" encompassing all relevant characteristics, but such a "global model" would probably not be tractable and thus be quite useless.

[88] The mere repetition of the "static" or "non-collusive" equilibrium is always an equilibrium (and even a subgame-perfect one) of the repeated game.
[89] In this context, it is not surprising that courts are reluctant to tackle collusion cases in the absence of a "smoking gun" – see the discussion below.
[90] Past behaviour can however provide some information about specific characteristics of the market participants, which can for example be useful to identify whether firms are prone to collusion or of a "maverick" type.

The above discussion provides however a basis for prioritising the relevant factors, with an emphasis on the necessary ingredients (high entry barriers, frequent interactions and little role for innovation) and on the most important factors (number of market participants, their degree of symmetry, and so forth). Understanding the respective role of each factor also facilitates an overall assessment when several factors have a role and push in different directions.

Evaluating the impact of a merger on collusion will however remain by nature more difficult than the analysis of single dominance. This is also reflected in the more limited help offered by quantitative or econometric approaches. In particular, while some successful efforts have been made to evaluate *ex post* the likelihood of collusion in a particular industry, predicting the impact of a merger on the *future* likelihood of collusion appears substantially more challenging. If firms were not tacitly colluding in the pre-merger phase, past market data and econometric studies can help in assessing key structural parameters but will not provide direct information on potential collusive behaviour. But even if there is some evidence on past collusive conducts, one has to account for the fact that firms will adapt their conduct to accommodate the new environment created by the merger, which again requires some prospective analysis.

Antitrust enforcement against collusion

Antitrust authorities can attack explicit forms of collusion where, say, managers meet, exchange information and conclude agreements on prices or market shares. The main difficulty in that case is to establish the existence of such explicit agreements and get hard evidence that would stand in court. Antitrust enforcement can launch detailed investigations and down-raids – and rely on indirect or informal evidence to target likely suspects.

Another possibility is to encourage informed parties to come and provide the needed evidence. The interest of this approach is exemplified by the development of leniency programs which have already encountered substantial successes, first in the US and then in Europe.[91] Leniency programs vary in design and scope: they may apply to companies or individuals, provide full or limited protection, concern first informants or be extended to later ones as well, and so forth. The performance of these leniency programs also varies,[92] which provides some ground for enhancing and fine-tuning their design.[93]

In the absence of any hard evidence of explicit agreements, which could be caught in the EU under Article 81 and in the US under Section 1 of the Sherman Act, it is difficult if not impossible to directly fight collusion *per se*. There might actually be a debate as to whether antitrust authorities should take actions against purely tacit collusion, where by definition

[91] In the US, firms bringing information before an investigation is opened benefit from such a leniency program since 1978. The EU has adopted a leniency program in 1996, which allows firms that bring information to benefit from reduced fines. The Office of Fair Trading in the UK and the recent competition bill in France have also introduced leniency programs.

[92] In the US for example, it is only after the reform of 1993 extending leniency to firms that bring information after the investigation has been opened (as long as the Department of Justice has not yet been able to prove collusion), that the leniency programs became effective. Thanks to this reform, on average 2 cartels are now disclosed every month, and the fines often exceed 100 million $ (not to mention jail for some managers). In 1999 only the Antitrust Division secured more than 1 billion $ in fines, which is more than the total sum of fines imposed under the Sherman Act since its adoption more than a century ago. The EU has also recently amended its leniency program to improve its performance.

[93] These programs have also triggered a body of theoretical work. See e.g. Spagnolo (2000a,b) and Motta-Polo (2000).

firms set prices non-cooperatively. Such actions would come close to regulating prices, something that competition authorities and courts are generally reluctant to do. In the US, Section 2 of the Sherman Act condemns for example monopolization but not the exploitation of market power through high prices. In the European Union, charging an excessive price can constitute an abuse of dominant position. Article 82 thus provides a basis under which tacit collusion could be attacked. However, building a case on the abuse of a dominant position requires establishing dominance, which in this case would amount to prove that collusion indeed occurred and, as noted, raises large difficulties both on legal and economic grounds.[94] Overall, it is unlikely that an abuse of collective dominance case could rely solely on the past realisation of prices or market shares.[95]

Short of fighting collusion directly, competition authorities can attack those practices that facilitate collusion. Thus, for example, antitrust authorities may want to block *Resale Price Maintenance* when it facilitates collusion by generating more uniform prices. In the same vein, competition agencies may want to have a close look at marketing practices that tend to make the market more "transparent", in the sense that they allow the market participants to infer more easily the pricing strategies of their competitors.

5. Dominance versus monopolization – a legal overview

Throughout the world, antitrust authorities aim to maintain effective competition on markets by fighting cartels, by constraining the behaviour of firms that are insufficiently disciplined by the competitive process itself, and by controlling mergers. In this section and the next we look at two jurisdictions, the US and the EU, and at two of these policy domains, i.e. we do not look at issues related to agreements and cartels. Although phrased in different terms, superficially, the US Antitrust Laws and the EU Competition Laws in these domains appear very similar, but here we will focus more on the differences between the two systems. This section focuses on the policies with respect to dominance and monopolization, while the next section compares policy towards mergers in these two jurisdictions.

5.1 The rules of the game

The Sherman Act, which dates from 1890, constitutes the core of the US competition regime. Section 1 of that Act prescribed agreements in restraint of trade, it is very much like Article 81 EC, and will not be dealt with here. Section 2 of the Sherman Act prohibits monopoly abuse. It states:

[94] While the past history of prices and market shares brings information, it will not in general provide a definite conclusion – even the most advanced econometric models only provide probability estimates. From a legal perspective, establishing collusion would involve a standard of proof similar to the high standard established by the European Court for Article 81 in its *Woodpulp* Judgement (1993). The Court basically required to prove that no other behaviour than collusion could explain the observed realisation of prices, a rather insurmountable task.

[95] This suggests that a « pure » Article 82 case is unlikely for collective dominance. However, cases could be built – and have already been so, see e.g. *Compagnie Maritime Belge* – on both Articles 81 and 82. Competition authorities can also use past behaviour to alert industry "supervisors" about abnormally high prices. They can for example provide such information to consumer associations, in order to increase customers' awareness of the problem. In regulated industries, competition authorities can also alert regulators or point to deficiencies in the regulatory environment.

"Every person who shall monopolize, or attempt to monopolize, or combine or conspire with any other person or persons, to monopolize any part of the trade or commerce among the several States, or with foreign nations, shall be deemed guilty of a felony..." (15 U.S.C §2).

Note that the offence is monopolization, not monopoly itself, and that two types of abuse are distinguished: attempted monopolization and monopolization. Attempted monopolization is the use of improper business strategies to attain monopoly status; monopolization is the use of improper methods to attain or maintain a monopoly, or to extend it still further. Here, monopoly should not be taken literally, the use of improper tactics is also forbidden for firms that do not have 100% market share; what matters is whether the firm has considerable market power, i.e. the ability to control price.

In Europe, "dominance" is the key concept in the two areas of competition policy on which we focus. Article 82 of the EC Treaty (formerly Article 86), which was signed in 1958, aims to constrain the behaviour of firms that are not constrained by other competitors on the market, it forbids firms to abuse a dominant position. The article states:

"Any abuse by one or more undertakings of a dominant position within the common market or in a substantial part of it shall be prohibited as incompatible with the common market in so far as it may affect trade between Member States.

Such abuse may, in particular, consist in:

a) directly or indirectly impose unfair purchase or selling prices or other unfair trading conditions;
b) limiting production, markets or technological 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."

These articles raise the questions whether a dominant position should be interpreted as a (near) monopoly, whether monopolization should be interpreted similarly to abusing a dominant position, and how to deal with combined monopolization, respectively joint dominance. We will discuss these issues in turn.

Before going into differences, let us, however, stress the similarity in procedures that are used in both jurisdictions. In the US, as well as in Europe, antitrust analysis starts with the identification of the relevant market and the competitive situation on that market: both dominance and monopoly refer to a certain relevant market. The Notice on the Definition of the Relevant Market, which has been published by the European Commission, gives a good description of how that market is identified. It also shows how economic thinking, as represented by the SSNIP-test, which originated in US antitrust practise, influences policy making . In this respect, it is interesting to note that both the authorities in the US and those in Europe have been criticised for having identified an aftermarket (i.e. the market for

complementary services associated with a durable product) as a separate relevant market, even in cases where the durable product itself is offered on a market with effective competition, see Kodak , Hugin and Hilti. It will be clear that the issue of whether "locked-in" consumers should receive special protection is a controversial issue. In Europe, the next step in the procedure is to see whether there is a position of dominance on that market, where after it is studied whether that position has been abused by a certain business strategy. In the US, the procedure is roughly similar, but there is somewhat less emphasis on the second step, as we will explain below. In any case, the tests and economic theories that are used in the third step are similar, although different weights may be attached to them.

5.2 Dominance, monopoly and market power

In cases that come under Section 2 of the Sherman Act, after having identified the relevant market, the authorities next investigate whether the firm in question has attained monopoly status. Typically, if the market share is about 75 percent or more, that is said to be the case. In the third step, the behaviour in question is investigated. Here, the distinction between "attempt to monopolize" and "monopolization" is relevant. As in actual antitrust practise, emphasis is on the behaviour and not on the status of the firm, we defer that discussion to section 6.2.

Individual dominance

In contrast, in Europe relatively much importance is attached to the status of the firm: is it dominant or not? In one of the early cases arising out of Article 82, United Brands, the ECJ (the European Court of Justice) gave a definition of dominance that it has frequently relied upon since. One year later, in Hoffmann-La Roche, the ECJ somewhat refined that earlier definition, and that definition still stands today:

"38. The dominant position thus referred to relates to a position of economic strength enjoyed by an undertaking which enables it to prevent effective competition being maintained on the relevant market by affording it the power to behave to an appreciable extent independently of its competitors, its customers and ultimately of it consumers.

39. Such a position does not preclude some competition, which it does where there is a monopoly or a quasi-monopoly, but enables the undertaking which profits by it, if not to determine, at least to have an appreciable influence on the conditions under which that competition will develop, and in any case to act largely in disregard of it so long as such conduct does not operate to its detriment."

The reader notices that this definition has two elements to it. First, the dominant firm is able to behave (to an appreciable extent) independently of others; secondly the dominant firm is able (to an appreciable extent) to influence how competition on the market will develop. While the definition is not one that one finds in economics textbooks, the second element should make it clear that dominance is a broader concept than "uncontested monopoly": a firm that is able to influence the "parameters of competition" may be found to be in a dominant position. An economist is inclined to think that a dominant firm is one that has considerable market power, i.e. that is able to profitably set price considerably above (marginal) cost. Of course, market power is a matter of degree and there is no clear dividing line between monopoly and perfect competition. Also note that, in contrast to the SMP-framework known from the European telecommunications sector, dominance is not a label

that a firm carries with it and that brings special obligations. In the telecommunications sector, there is asymmetric regulation and firms that are classified as having SMP (i.e. significant market power) do have special obligations imposed upon them. Furthermore, the label "SMP-operator" is assigned in advance, and is withdrawn only by a decision of the regulator in charge. In competition policy, a firm is found dominant (or not) in the course of an investigation and also a dominant operator "just" has to follow the law. Nevertheless, as we will see below, there I some asymmetry: some types of behaviour that would be considered "unproblematic" for firms that are non-dominant, are considered to be violations of the law for dominant firms.

Market share and market power

In assessing whether or not a firm is dominant, the European Commission and the European Court place great emphasis on the market share of the firm. Already in Hoffmann-La Roche, the Court held that very large market shares are in themselves indicative of dominance:

"41. Furthermore, although the importance of market shares may vary from one market to another the view may legitimately be taken that very large market shares are in themselves, and save in exceptional circumstances, evidence of the existence of a dominant position."

In the case in question, several markets were investigated; when market shares were above 75%, the Court did not look beyond the market shares; where the share was lower (around 50%), the Court looked at other factors, such as the market shares of the competitors, and in one market (that for Vitamin B3), the Court annulled the Commission's finding of dominance since the Commission had not looked at these other factors. Later, in AKZO, the Court ruled that a share of 50% was a very high market share. We may conclude that, if the market share is above 50%, there is, essentially a presumption of dominance. In United Brands, UBC was found to be dominant with a market share of 45%. To date, there have been no cases where a firm with a market share of 40% or less was found to be dominant, although the Commission has not excluded that possibility.

In both the US and in Europe, the antitrust authorities have frequently been criticized for attaching too much weight to market shares and for paying relatively little attention to entry barriers. Of course, economists are well aware (for example through the theory of contestable markets) that high market shares are, in themselves, no indication of market power. In the absence of entry barriers, firms with very high market shares need not have much market power. Conversely, firms with relatively small overall market shares may nevertheless enjoy high market power in special circumstances. Here, one may think of electricity markets, where the ability to influence price is also related to the flexibility of the production technology that is employed: if the market is tight and large-scale base-load facilities are operating at full capacity, then a small-scale producer that has the opportunity to turn units on or off may be able to drive up the price considerably by withholding capacity from the market. In other words, market share is a very imperfect indicator of market power and it should not be looked upon in isolation: other factors, such as entry barriers and flexibility, and the time it takes to adjust competition variables, play an equally important role.

For sure, it is true that the European Commission and the Court do take into account a variety of other factors to assess dominance. In addition to the market share of the firm concerned, one looks at the relationship between the market share of this firm and those of its competitors, at entry barriers, and at whether the firm has a superior technology, or better

access to financial markets, or to other key inputs than its competitors, etc. The current thinking of the European Commission of the relevance of market shares and other factors for assessing dominance is well described in the recent Draft Commission Notice on the appraisal of horizontal mergers, to which we refer the interested reader for further details.

Collective dominance

Article 82 forbids "any abuse by one or more undertakings of a dominant position", a formulation that leaves room for the possibility that several firms collectively hold a dominant position, and that such a position might be abused either collectively or by at least one of the firms involved. The question under what conditions firms can be considered collectively dominant, that is whether Article 82 can be used to restrain behaviour in (tight) oligopolies, has been extensively discussed in the literature. In a couple of relatively recent judgements, Flat Glass , Almelo , and Compagnie Maritime Belge the CFI (Court of First Instance) has provided some clarity on this issue. In the latter, most recent, case, the CFI wrote:

"36 (…) a dominant position may be held by two or more economic entities legally independent of each other, provided that from an economic point of view they present themselves or act together on a particular market as a collective entity. That is how the expression 'collective dominant position', as used in the remainder of this judgement, should be understood."

To an economist, the wording "independent firms acting together as a collective entity" is very much like the definition of collusion, hence, an economist is tempted to interpret the above as "firms, in a tight oligopoly, that tacitly collude, may be found to be collectively dominant". While this may clarify the definition of collective dominance, it is not clear, however, that this is of much help. For one, having a dominant position is not forbidden, only abusing it is. Secondly, since (tacit) collusion constitutes a violation of Article 81, the question is: what is the "added value" of being able to classify firms in an oligopolistic industry as being collectively dominant? For sure, even if one could perhaps agree that tight oligopolies need special scrutiny, it seems that one would not want to classify non-cooperative oligopolies as holding a dominant position. We will return to these issues in Section 7 where we will discuss mergers. As we will see there, the concept of collective dominance also plays a role when evaluating mergers, and the term (collective) dominance has the same interpretation under the European Community Merger Regulation (ECMR) as under Article 82.

5.3 Abuse and monopolization

The essence of the US-system is that honest, tough competition is never forbidden. In other words, whether a business strategy is proper or not does not depend on the position that the firm occupies. In this respect, there is a difference with Europe, where dominant firms have a special responsibility towards competition on the market. Hence, in Europe some strategies that are legal when pursued by non-dominant firms are no longer so when employed by dominant firms. Of course, in the US, whether or not the antitrust authorities scrutinizes a firm may depend on that firm's position, but (in theory at least) the classification of the strategy adopted does not depend on the status of the firm. Whatever the situation of the firm, conduct is improper if it is other than competition on the merits, and such improper conduct may be declared illegal if it could lead to monopolization.

Somewhat more formally, in the US, unfair business tactics that attempt at monopolization are illegal whenever, in the view of the court handling the case, there is a "dangerous probability" that the attempt could be successful. Most courts would look at the market power of the firm in question to gauge that probability and market shares of around 40-50 percent may be indicative of the probability being dangerous, hence, in such cases, the behaviour will be scrutinized more closely. The Court will then investigate whether there is "monopolistic intent", i.e. is there evidence that the firm wanted to destroy competition and create a monopoly. The evidence can be direct, in the form of company documents, or indirect, in the form of business strategies that are only rational when part of a plan to eliminate competition.

What about a firm that already has acquired a monopoly position? We note that, although having a monopoly is not illegal, neither in the US, nor in Europe, there is an essential difference in treatment in the two jurisdictions. In the US, a monopoly may exploit its monopoly position, but such "monopolistic exploitation" is not allowed in Europe. While Section 2 of the Sherman act aims (only) at preventing "monopolization" of markets, Article 82 EC primarily seems to focus on constraining monopolies. Historical factors may explain this difference in emphasis. While in the US, the main goal of policy was to prevent dominant firms coming into existence; in Europe at one time it was (and, in some circles, it perhaps still is) thought that large European firms are necessary to profit from scale activities and to successfully compete on world markets. According to this view, competition policy should not stand in the way of firms trying to become dominant. In this respect we may also note that, in Europe, merger control has become an instrument of competition policy only in 1990, 32 years after signing the Treaty of Rome, which included provisions for cartels and dominant positions, and that, even at present, the policy with respect to mergers is much more lenient than the policy with respect to cartels.

Exploitation and anti-competitive behaviour

In the US, just as any other firm, a monopoly simply may not use improper methods to suppress competition on the merits, but it is not forbidden to maximize its profits through any regular means. This is not to say that regulation of dominant firms does not play a role in the US, it certainly does, but it is not done by the Competition Authorities, but by sector-specific regulators. In these cases, the monopoly usually does not result from superior entrepreneurship, but rather is the natural consequence of technology or the outcome of political privilege, hence, in such cases, no special reward is necessary. In Europe, when the competition laws were established, there were few such regulators, and perhaps this is another reason why more regulatory powers were given to the European Commission.

In the text of Article 82, four examples of possible abusive behaviour are given. One notices that the examples all deal with the relation between the dominant firm and its customers, where (b) also refers directly to the final consumers. All of these examples, therefore, deal with straightforward monopolistic exploitation. In fact, there has been a discussion about whether Article 82 only aimed to deal with exploitative behaviour, or whether, like Section 2 of the Sherman act, Article 82 could also catch "monopolization", i.e. anti-competitive behaviour directed at competitors of the dominant firm. This discussion was at least in part fuelled by the fact that the French and German texts of Article 82 speak of "abusive exploitation". The French competition lawyer Joliet, at one time a judge in the ECJ, has argued that Article 82 was only intended to deal with monopolistic exploitation, and not with preservation of the competitive process, hence, in his view the only aim of the article was to

regulate monopolistic market power; see Joliet (1970). In Continental Can, the ECJ made it clear for the first time that Article 82 does not only apply to exploitative behaviour, but also to anti-competitive conduct which weakens competition that is already weak:

"20 (...) The question is whether the word 'abuse' in Article [82] refers only to practises of undertakings which may directly affect the market and are detrimental to production or sales, to purchasers or consumers, or whether this word also refers to changes in the structure of a market, which lead to competition being seriously disturbed in a substantial part of the Common Market.

26 (...) the provision is not only aimed at practises which may cause damage to consumers directly, but also at those which are detrimental to them through their impact on an effective competition structure, such as is mentioned in Article [3(1)9] of the Treaty. Abuse may therefore occur if an undertaking in a dominant position strengthens such position in such a way that the degree of dominance reached substantially fetters competition, i.e. that only undertakings remain in the market whose behaviour depends on the dominant one."

Since Continental Can, the ECJ has confirmed on various occasions that Article 82 may apply to anti-competitive conduct. A particularly clear statement is found in Hoffman-La Roche, where the ECJ used a wording that it has frequently used since then

"91 (...) The concept of abuse is an objective concept relating to the behaviour of an undertaking in a dominant position which is such as to influence the structure of the market where, as a result of the very presence of the undertaking in question, the degree of competition is weakened and which, through recourse of methods different from these which condition normal competition in products or services on the basis of the transactions of commercial operators, has the effect of hindering the maintenance of the degree of competition still existing in the market or the growth of that competition."

The conclusion thus is that Article 82 does not only deal with exploitative behaviour but also with anti-competitive behaviour that aims to weaken competition on a market where competitive pressure is already weak. In fact, since the Commission has dealt with only very few cases of monopolistic exploitation, the European Commission has been unwilling to act as a price regulator, the emphasis in Article 82 cases has been on anti-competitive behaviour, and the difference with US law thus appears not to be so great.

Monopolistic exploitation

The reason for the fact that the Commission has dealt with few cases of "excessive pricing" probably is that the Commission burnt its fingers in United Brands, the leading case of this type. The ECJ annulled that decision and since then the Commission was careful not to burn its fingers again. Of course, it may be very difficult to decide which prices are fair and which prices are excessive. Furthermore, if it is found that prices are excessive, then the only remedy may be price regulation and this may not be something for which a competition authority is well-equipped: it may require relatively many resources, and may not yield benefits proportional to the importance of the case; see the discussion in Section 2.

Whether a price is excessive may (perhaps) be determined by comparing the price in question with prices of comparable products in comparable markets, but, of course, the question is: what is comparable? In United Brands, the Commission adopted this methodology and while

the ECJ accepted it as a valid one, the ECJ did not accept the data presented by the Commission. Even if the Commission claimed price differences of about 100%, the ECJ annulled the decision on this point. The ECJ also accepted that prices that do not bear a relation to the product's economic value could be excessive, and that a high price-cost margin, or high profits might be signals of excessive pricing, but it did not want to commit itself to levels. Consequently, there is even now quite some ambiguity about when prices should or could be classified as being excessive, see Pijnacker Hordijk and De Vries (2002).

Undeterred by this state of affairs, competition authorities that are new entrants to this game, such as the Dutch NMa, which came into existence only in 1997, have shown a willingness to investigate claims of excessive prices, with an equal willingness to perform detailed cost studies. The methodology used in some of these cases is the usual one adopted by regulators in capital intensive industries, such as telecoms: a price is "reasonable" if the return on the assets invested is not (much) higher than the return on capital that investors demand, as measured by the WACC of the company. One of us has argued elsewhere, Van Damme (2001) that this methodology is flawed and that, in any case, competition authorities should only behave like regulators and do detailed cost studies if the dominant position has been clearly established and there are substantial entry barriers. After all, absent entry barriers, high prices will invite entry; hence, it is unlikely that prices could be excessive.

Anti-competitive behaviour

Moving from exploitative behaviour to anti-competitive behaviour, we note that, in contrast to Joliet's views referred to above, European policy with respect to "anti-competitive behaviour" appears to have been more hostile and more interventionist than policy in the US. The above quotation from Hoffmann-La Roche raises the question about how to differentiate "normal competition" from "anti-competitive actions" and here it seems that the EU-authorities are inclined to readily label actions as being "anti-competitive". In this regards, the Commission and the Court frequently refer to the fact that dominant firms have a special responsibility towards their competitors and the competitive process. For example, in Michelin the Court stated

"57 (...) A finding that an undertaking has a dominant position is not in itself a recrimination but simply means that, irrespective of the reasons for which it has such a dominant position, the undertaking concerned has a special responsibility not to allow its conduct to impair genuine undistorted competition on the common market"

The Court returned to this phrasing in later important decisions such as Irish Sugar and Compagnie Maritieme Belge. Note that this quote suggests that even a firm that has obtained its dominant position as a result of its own economic strength will have special responsibilities and may not be able to use business strategies that would, under situations of non-dominance, be unobjectionable. US authorities would not be willing to go that far: one may scrutinize dominant firms, but why should one deny them the use of usual business practises? Not surprisingly then, the EC-policy has been criticized in this respect; for example, see Jebsen and Stevens (1995).

Refusal to supply

It is in cases where a dominant firm refuses to supply an existing customer or a potential competitor on the output market, that the difference between EU and US policy most probably

traditionally is largest. Ordering the dominant firm to supply is a strong interference with business freedom; hence, authorities should be most reserved in adopting such measures. In the US, the antitrust authorities have always shown considerable restraint, but in Europe, policy has typically been much more interventionist. It is here that the special responsibility towards competition that a dominant firm is said to have is playing an important role. Leading cases of this type, Commercial Solvents, United Brands and Hugin, all referred to already above illustrate this very clearly.

In Commercial Solvents, a pharmaceutical company cancelled orders for a certain raw material, presumably expecting to be able to buy it cheaper elsewhere. When the alternative supplies did not prove satisfactory, it turned to the original supplier again, but it did not want to supply anymore, as it wanted to vertically expand into the end product market itself. The ECJ ruled that the dominant producer of the raw material had abused its dominant position as its strategy could eliminate all competition from the market. Hugin is essentially similar: a manufacturer no longer wanted to supply spare parts to a retailer is it wanted to build up its own spare parts business. In United Brands, UBC wanted to punish a distributor for the fact that it had participated in a promotional campaign of a competitor of UBC. According to the ECJ, the counter-measure of no longer supplying this distributor was not proportional and, hence, abusive. It is remarkable that, in all these cases, there is little attention to efficiency arguments: the dominant firm is simply said to have a responsibility to keep competition alive.

Essential Facilities

In some of the refusal to supply cases discussed above, a competitor could not compete on the market for some final product if it did not have access to some raw material that is produced by the dominant firm. In the case of essential facilities, the situation is similar, but now a competitor needs access to the production facilities of the dominant firm. The question now is under what conditions, and against which terms, the dominant firm should be forced to share its facilities.

The first essential facility cases that the Commission considered were related to physical infrastructure, harbours in particular. In these cases, a vertically integrated company that owned the facilities at a harbour A, also offered a ferry service between this harbour and harbour B. A competitor also wanted to offer ferry services between A and B, but, in order to do so, it needed access to the facilities at harbour A. Should the incumbent be forced to offer harbour services? If so, at what price? Cases that the Commission dealt with are, among others Sealink/B&I Holyhead and Sea Containers Ltd. vs. Stena, and in these it established the position that the integrated company was not allowed to discriminate between its own ferries and that of the competitor, hence, it should offer access. The first, non-infrastructure case in this domain was Magill where broadcasting stations were not willing to hand over their programming data to a publisher who wanted to publish a complete programming guide. The ECJ argued that the refused to supply prevented a new product, for which there was apparent demand, from coming on the market, hence, that the refusal to supply constituted an abuse according to Article 82(b).

These decisions have been criticized for being too interventionist and for eliminating firms' incentives to invest. Quite interestingly, in these cases, the European Commission has made use of the so-called "essential facilities doctrine" that originates in the US, and that it has also been extensively criticized there, mainly for the fact that it deters investment both in existing

and in competing infrastructure and, hence, prevents infrastructure from coming into existence; see Areeda (1990).

In a recent important essential facilities case, Bronner, the ECJ has, however, taken a very much different attitude. In this case, the ECJ shows its awareness of the investment issue and it shows restraint in granting a competitor access to the facilities of a dominant firm. Bronner deals with a small newspaper company, with low circulation, that wants to get access to the nationwide distribution system of a larger competition. Bronner argues that its circulation is too small for it to have its own viable system, hence, that it should get access to the unique nationwide distribution system, that of its competitor. The ECJ, in essence argues that, given the current market shares, the claim might be true, but that this fact does not justify getting access. If Bronner would have an equal market share as the leading firm, then a nationwide distribution system would be viable from Bronner itself; hence, the competitor should not be forced to share. It has been argued in Bergman (2000) that this Bronner-test constitutes a formidable hurdle for new entrants: it may simply not be feasible to reach a comparable market share within a reasonable time frame. It has also been argued, in Hancher (1999), that, if the Commission would have adopted this stringent Bronner test in earlier cases, it would not have been able to come to the conclusion that access should be granted, as was the conclusion at the time.

6. Dominance versus substantial lessening of competition

Both the US and the EU know a system of merger control. Remarkably, in both jurisdictions, this instrument of structural control over the market was introduced only some 20 years after the first behavioural controls over business were introduced. While the Sherman Act dates from 1894, merger control was introduced in the US only in 1914. The EU came much later: laws prohibiting cartels and "regulating" dominant firms were introduced in 1958, while the EC Merger Regulation (ECMR) came into effect only in 1980. Already in 1966, the European Commission had remarked that, as both Article 81 and 82 deal with behaviour, it did not have a strong instrument to control essential changes in the structure of the market, and that a full system of merger control was needed to maintain effective competition in the common market and to reach the goals of the EEC Treaty. As the change required unanimous approval by the Council and since different Member States had different views on what the goals of merger policy should be (and, in particular, about the role of industrial policy), it took 23 years until the ECMR was finally adopted.

Indeed, it is an interesting question what the goals of merger policy should be. Two broad goals may be distinguished. Given the difficulties involved in constraining the behaviour of dominant firms, the main purpose of EC merger control seems to be to prevent dominant firms coming into existence. On the other hand, in the US, the main goals seems to be to prevent "anti-competitive" market structures. The differnce in emphasis leads to a different test: while the US authorities check whether a merger would lead to a significant lessening of competition, the European Commission verifies whether or not it would lead to a dominant position. In this section, we investigate the consequences of these different substantive tests, and we also briefly touch upon differences in procedures.

6.1 Rules and procedures

In the US, Section 7 of the Clayton Act, first enacted in 1914, controls mergers. It states that forbidden are acquisitions

> "... where in any line of commerce or in any activity affecting commerce, in any section of the country, the effect of such acquisition may be substantially to lessen competition, or to tend to create a monopoly" (15 U.S.C. §18).

The EC Merger Regulation (ECMR), which was adopted in 1989 and which came into force on 21 September 1990 states in Article 2(3):

"3. A concentration which creates or strengthens a dominant position as a result of which effective competition would be significantly impeded in the common market or in a substantial part of it shall be declared incompatible with the common market."

We note that in the ECMR, dominance has the same meaning as in Article 82; hence, the definition was provided in the previous section. Of course, one important difference is that merger analysis is prospective, whereas Article 82 sees at the firm's past behaviour. Also note that the substantive test in merger appraisal is a two-part test: the merger should create or strengthen a dominant position and, as a result of that, effective competition should be

significantly impeded. It is thus possible that a merger creates or strengthens a dominant position, but is nevertheless allowed, since it does not significantly impede competition. Furthermore, according to this test, mergers that significantly impede competition without creating or strengthening a dominant position should be allowed as well. The EU-test thus appears permissive: both conditions have to be satisfied for merger to be forbidden. In contrast, the Clayton Act states that mergers that substantially lessen competition or tend to create a monopoly are forbidden. In practise, since competition will usually be lessened already before monopoly is reached, cases in the US focus on "significant lessening of competition", while in Europe the focus is on "dominance".

Firms that want to merge have to notify to the agencies that are responsible for those jurisdictions where the merger has effects. There are important procedural differences in the way merger notifications are handled in the US and in Europe. In the US, one has to notify to both the Federal Trade Commission and to the Antitrust Division of the Department of Justice. One of these agencies will handle the merger and will decide whether there is no anticompetitive effect and it can go through, or whether to file suit to prevent the merger from taking place. The US-system is an adversarial system. If the Antitrust Division wants to block a merger, it has to bring a court case, and the Court will weigh the arguments of the merging parties against those of the Department of Justice. In Europe parties notify to the European Commission, which investigates the case, which negotiates with parties to get remedies to relief competition concerns, and which decides to block the merger in case the latter are judged to be unsatisfactory. Consequently, the European Commission has a rather large discretionary power.

In Europe, parties can appeal the Decision of the Commission, with the Court of First Instance (CFI), but it takes long before that Court will decide. For example, in Airtours, the Commission blocked the merger in 1999, and it took 2 years before the CFI annulled that decision. Of course, the industry might have changed considerably during such a long period, and it is, hence, not too surprising that relatively few cases have been appealed, although as of recent, there is more activity, with also more cases being annulled by the CFI. It has been argued that, as a consequence of these procedural differences, the European Commission faces less effective checks and balances and, therefore, has more room to fall prey to "demonstrably erroneous economic theory, and speculation contrary to the weight of the evidence", this leading to a larger probability of mistaken decisions: see Patterson and Shapiro (2001).

Patterson and Shapiro also point to the notable fact that, until recently, the European Commission has not been willing to commit itself by issuing guidelines on how it will evaluate mergers. In the US, the first merger guidelines were published in 1968, in Europe it took till the end of 2002 before the Commission published its first draft of the guidelines for horizontal mergers. Remarkably, this draft shows a close resemblance to the US Merger Guidelines.

The US Horizontal Merger Guidelines

The Merger Guidelines describe the analytical framework and methodology used by the Antitrust Division and the Federal Trade Commission to determine whether a horizontal merger is likely substantially to lessen competition and, hence, should be challenged. The unifying theme of the Guidelines is that mergers should not be permitted to create or enhance

market power. They specify a five-step procedure to answer the ultimate inquiry in US-merger analysis: is the merger likely to create or enhance market power or to facilitate its exercise?

In the first step, the relevant (affected) markets and the players on these markets are identified, and it is assessed whether the merger would significantly increase concentration. The Herfindahl-Hirschman Index ("HHI") is used to measure market concentration and three broad regions are distinguished: unconcentrated markets (HHI below 1000), moderately concentrated markets (HHI between 1000 and 1800), and highly concentrated markets (HHI above 1800). In evaluating a merger, both the post-merger market concentration and the increase in concentration resulting from the merger are considered. If the post-merger market is moderately concentrated (resp. highly concentrated) and the merger increases the HHI by more than 100 (resp. more than 50) points, then the merger potentially raises competitive concerns, and should be investigated. In highly concentrated markets, it is presumed that mergers that increase the HHI by 100 points or more are likely to enhance market power. In all other cases, the Agency regards the merger as unlikely to have adverse competitive effects and ordinarily to require no further analysis. The authorities consider that market share and market concentration data may either understate or overstate market power, hence, the rule cannot be mechanical. A variety of other market characteristics (such as volatility of market shares, and the importance of innovation) are therefore considered.

In the second step, it is studied whether the merger could have potential adverse competitive effects. Two channels through which a merger may harm competition are distinguished. First, a merger may diminish competition by making it easier for firms to coordinate their actions, hence, to collude either tacitly or overtly. To check whether this possibility is real, the authorities go over a checklist of market factors (“facilitating circumstances”) as in Section 4, in order to check whether it is possible for firms to coordinate and to discipline potential deviators. Here, also factors that would make such coordination more difficult, such as the existence of “maverick firms” are investigated. Secondly, as a merger eliminates one competitor from the market, it loosens a competitive constraint, and this may enable the merged firm (and indeed, in response also its competitors) to raise prices. This is the second channel through which a merger may diminish competition, the so-called unilateral effects: the merging firms may find it profitable to alter their behaviour unilaterally following the acquisition by elevating price and suppressing output. Of course, if competitors could easily substitute the offerings that, as a result of the merger, are withdraw from the market, then the competitive constraint will not be much loosened and there need not be much reason for concern.

It is realized that a merger is not likely to create or enhance market power or to facilitate its exercise, if entry into the market is so easy that existing market participants could not profitably maintain a price increase above premerger levels. Such entry likely will deter an anticompetitive merger in its incipiency, or deter or counteract the competitive effects of concern. The third step of the analysis thus involves checking whether new market entry could counteract the competitive effects of concern. The Agency investigates whether entry is possible and likely, whether it would be timely and would be sufficient to return competition and market prices to their premerger levels..

In the fourth step, the Agency assesses any efficiency gains that reasonably cannot be achieved by the parties through other means than the merger. Here it is realized that efficiencies generated through merger can enhance the merged firm's ability and incentive to

compete (for example, two high cost producers may join forces and obtain cost savings, making them a more effective competitor), which may result in lower prices, hence, higher consumer surplus. The Agency will thus investigate whether such efficiencies are likely to be achieved, and whether they are merger specific. Cognizable efficiencies are defined as merger-specific efficiencies that have been verified and do not arise from anticompetitive reductions in output or service. If such cognizable efficiencies likely would be sufficient to reverse the merger's potential to harm consumers in the relevant market, e.g., by preventing price increases in that market, then the Agency will not challenge the merger.

Finally the Agency assesses whether, but for the merger, either party to the transaction would be likely to fail, causing its assets to exit the market. In such cases, the merger will have no effect on competition on the market, it is not likely to create or enhance market power or to facilitate its exercise, and can be allowed.

Merger Appraisal in Europe

Broadly speaking, the MTF (Merger Task Force) of the European Commission follows a similar procedure as outlined in the US guidelines, but there are important differences in the second and fourth step. Before turning to these differences, let us briefly discuss the elements of communality. In the first step, there is not much difference, certainly not in the way the relevant market is identified. The Commission also looks at ease of entry. Furthermore, the "failing firm defence" is also allowed in Europe. Recall that the ECMR specifies a two-part test: proscribed are mergers that create a dominant position as a result of which competition is significantly impeded. It is possible that a merger creates or strengthens a dominant position, but is nevertheless allowed. Kali and Salz or, more generally, any case in which a failing firm is taken over by a dominant firm, provides a real life example of this possibility: dominance is strengthened, but there is no significant effect on competition. For example, in Kali and Salz, the Court remarked

"124. It follows from the foregoing that the absence of a causal link between the concentration and the deterioration of the competitive structure of the German market has not been effectively called into question. Accordingly, it must be held that, so far as that market is concerned, the concentration appears to satisfy the criterion referred to in Article 2(2) of the Regulation, and could thus be declared compatible with the common market without being amended."

On the other hand, the two-part test implies that, in Europe, mergers that significantly impede competition without creating or strengthening a dominant position should be allowed. As such mergers may well have negative consequences for welfare or consumer surplus, this may be considered undesirable. As a theoretical example of this possibility, think of a merger between the numbers two and three in a triopoly where the leader has 51 per cent of the market: competition is impeded, but no individually dominant firm is created or strengthened. It should thus be not surprising that the Commission has attempted to stretch its powers. In this specific case covered by this example, and indeed more generally, the Commission has done this by invoking the concept of "collective dominance".

In the remainder of this section, we first discuss this concept of collective dominance. Our discussion will lead to the conclusion, as also drawn by the Commission, that stretching "dominance" to "collective dominance" is not the way to go and that an alternative way is to

be preferred. Already at this stage we can remark that there are two obvious ways by means of which the substantive merger test in the EU could be strengthened:

i) by dropping the reference to dominance, in which case the test would become very much like the SLC-test (significant lessening of competition) that is used in the US and, since recently, in the UK
ii) by dropping the reference to "competition being impeded", in which case one would have a pure dominance test.

After having discussed "collective dominance", we will see that the Commission has recently proposed a third, and different, way to strengthen (or at least to clarify) the merger test from the ECMR.

6.2 Collective Dominance

We have already encountered this concept in the previous section. Note, however, that while Article 82 explicitly refers to a dominance position that may be held by one or more undertakings, there is no such reference in the EC merger test, hence, the question has arisen whether mergers that would create or strengthen situations of joint (or collective, or oligopolistic) dominance could be blocked: can mergers that produce tight oligopolies be forbidden?

While the European Commission already argued in 1986 that, in its view, mergers creating collective dominant positions were forbidden by the Regulation , it took till 1998 before the ECJ clarified, in Kali and Salz that collective dominance was caught by the Merger Regulation:

"178. It follows from the foregoing that collective dominant positions do not fall outside the scope of the Regulation."

This decision, however, left unclear what situations would be classified under the label of collective dominance, in particular, what links (structural or economic) between the firms were needed for these to be able to adopt a common policy on the market. This is the issue that we have already visited in the previous section. Clarity was provided in Gencor, a decision in which the CFI also referred to Flat Glass, and used similar wordings as in that case, making it clear that collective dominance has the same meaning in merger cases as in abuse cases. In particular, in Gencor, the CFI made it clear that contractual links between firms are not necessary for these to be collectively dominant: it is sufficient for there to be a tight oligopoly in which tacit collusion is a possibility

"276. Furthermore, there is no reason whatsoever in legal or economic terms to exclude from the notion of economic links the relationship of interdependence existing between the parties to a tight oligopoly within which, in a market with the appropriate characteristics, in particular in terms of market concentration, transparency and product homogeneity, those parties are in a position to anticipate one another's behaviour and are therefore strongly encouraged to align their conduct in the market, in particular in such a way as to maximize joint profits by restricting production with a view to increasing prices. In such a context, each trader is aware that highly competitive action on its part designed to increase its market share (for example a

price cut) would provoke identical action by the others, so that it would derive no benefits from its initiative. All the traders would thus be affected by the reduction in price levels."

Just as in the previous section, we can conclude that situations of tight oligopoly in which tacit collusion is feasible can carry the label "collective dominance". Indeed, in paragraph 277 of Gencor, the CFI explicitly states that the Commission should be able to control mergers in

"market structures of an oligopolistic kind where each undertaking may become aware of common interests and, in particular, cause prices to increase without having to enter into an agreement or resort to a concerted practise".

Coordinated effects and the folk theorem

The above description allows us to conclude that the coordinated effects that we encountered in the US Merger Guidelines are also covered by the ECMR, hence, in this domain the policies on the two continents should not be different, and the "checklist" from Section 4 applies to both jurisdictions. The model (theorem) that underpins this checklist is the Folk Theorem from the theory of repeated games. Here we wish to stress, however, that the Folk Theorem only tells us that, in tight oligopolies, tacit collusion may be an equilibrium outcome; it does not tell us that firms will necessarily collude. The question, therefore, remains how to assess the likelihood of tacit collusion and whether, in situations where mergers might produce market structure that could be conducive to tacit collusion, it would not be preferable to be more permissive and to rely more on monitoring ex post and intervention through Article 82. Is, given the fact that tacit collusion can be caught by Article 81, the mere fear that a merger possibly might lead to tacit collusion, sufficient to block a merger?

Airtours/First Choice

In 1999, the British tour operator and supplier of package holidays Airtours wanted to acquire its competitor First Choice. It notified the transaction to the Commission, which decided to block the acquisition, as it would lead to a position of collective dominance on the UK market for package holidays. In its Decision, the Commission tried to stretch the notion of collective dominance:

"54 (...) [I]t is not a necessary condition of collective dominance for the oligopolists always to behave as if there were one or more explicit agreements (e.g. to fix prices or capacity, or share the market) between them. It is sufficient that the merger makes it rational for the oligopolists, in adopting themselves to market conditions to act-individually-in ways which will substantially reduce competition between them, and as a result of which they may act, to an appreciable extent, independently of competitors, customers and consumers."

What is suggested in this passage (in particular by using the word "individually") is that the ECMR could also be used to catch non-cooperative adaptation to the changed market conditions. The decision itself was, however, not completely clear on this, as it also went over the checklist from Section 4 of facilitating factors for tacit collusion, hence, in Airtours the Commission added confusion to the meaning of collective dominance.

Airtours appealed the Commission's decision arguing both that the Commission had applied a new and incorrect definition of collective dominance and that it had erred in its

assessment that the merger would create a collective dominant position on the UK-market for short-haul package holidays. In 2001, the CFI annulled the decision of the Commission, arguing that the Commission had not proved to the requisite legal standard that the concentration would give rise to a collective dominance position that would significantly impede effective competition. In essence, the CFI argued that the characteristics of this market were such that tacit collusion was not very likely, or at least that the Commission had not argued convincingly that it was likely. The CFI, however, did not make any comments on the more fundamental point of whether "tight non-cooperative oligopolies" could be caught by the ECMR: "the Decision must be annulled, without it being necessary to examine the other complaints and pleas put forward by the applicant" (para. 295).

While there definitely is not enough space here to discuss the case in detail, it is worthwhile to mention some relevant aspects, so that the reader can form an opinion.

In Airtours, the Commission distinguishes two types of players on the relevant market, which is the market for short-haul package holidays: major tour operators that have market shares exceeding 10% and that are integrated both upstream (operation of charter airlines) and downstream (travel agencies), and secondary operators that have smaller market shares and that typically do not have their own charter airlines or travel agencies. The major companies account for about 80% of the market, divided as follows: Thomson: 27%, Airtours: 21%, Thomas Cook: 20%, First Choice: 11%. Note that with an HHI of over 1800 and an increase in HHI of over 400, the US authorities would start the analysis of this case with a presumption of market power being enhanced. On the other hand, the post-merger market share of 32% would not lead one to conclude that Airtours/First Choice would be dominant. Indeed, the Commission did not argue the case on single firm dominance, but on grounds of collective dominance; see para. 58 of the Decision.

Let us go over the checklist of factors facilitating tacit collusion, as mentioned in Section 4: how likely is tacit collusion? In the words of the CFI "Is it possible for the three major companies that remain after the merger to adopt a common policy on the market?". In para. 62, the CFI writes:

"(...) three conditions are necessary for a finding of collective dominance as defined:
first, each member of the dominant oligopoly must have the ability to know how the other members are behaving in order to monitor whether or not they are adopting the common policy (...) There must, therefore, be sufficient market transparency for all members of the dominant oligopoly to be aware, sufficiently precisely and quickly, of the way in which the other member's market conduct is evolving;

second, the situation of tacit coordination must be sustainable over time, that is to say, there must be an incentive not to depart from the common policy on the market (...) The notion of retaliation in respect of conduct deviating from the common policy is thus inherent in this condition (...) for a situation of collective dominance to be viable, there must be adequate deterrents to ensure that there is a long-term incentive in not departing from the common policy (...);

third, to prove the existence of a collective dominant position to the requisite legal standard, the Commission must also establish that the foreseeable reaction of current and future competitors, as well as of consumers, would not jeopardize the results expected from the common policy."

These conditions are broadly in line with the checklist from Section 4: tacit collusion requires that the players can monitor each others actions, so that they can detect deviations from the common policy; that they can punish deviations, so that deviating is not profitable; and that there are entry barriers, so that outsiders cannot make tacit coordination unprofitable by undercutting.

In its plea, Airtours argued that, in this specific market, none of these conditions was satisfied. First of all, while the Commission argued that the market involved relatively homogeneous product, Airtours argued that there is a lot of product heterogeneity, for example there are 50 holiday destinations and 20 airports of departure in the UK, hence 1000 combinations (and even many more different hotels) and these have different characteristics. The product heterogeneity makes coordination difficult and the market intransparant. Secondly, demand for holiday trips is volatile and demand is difficult to forecast at the point in time when capacity is planned, which is 18 months in advance of the season, hence, this also contributes to intransparency and makes monitoring difficult. Thirdly, because capacity is planned well in advance, retaliation cannot be quick and as a consequence, it is unlikely that deviation from the common policy can be deterred. Finally, Airtours argued that barriers to entry and barriers to expansion for smaller players were low: if the dominant players would tacitly collude and restrict hotel capacity, then the smaller players could easily expand, by making more bookings and by making more seat reservations with competing airlines. As a result, tacit collusion could not succeed.

The CFI reviewed these arguments and concluded that the Commission made various errors of assessment the market (predictability and volatility of demand, and the degree of market transparency), that it wrongly concluded firms could easily coordinate, that it erred in finding that there was a sufficient incentive for a member of the dominant oligopoly not to depart from the common policy, and that the Commission exaggerated the importance of entry barriers. As a result of these findings, the CFI was forced to annul the Commission's Decision.

6.3 SLC or dominance: does it make a difference?

The above discussion has made clear that the ECMR catches mergers that create situations of single or collective dominance. However, these situations are not the only ones in which effective competition may be significantly impeded: in an oligopolistic situation, a merger may considerably reduce consumer surplus also if it does not lead to coordinated behaviour. It seems that, thus far, the Merger Regulation did not catch such mergers and it might be argued that this is undesirable. In 2000, the European Commission published a green paper with which it consulted, among others, whether and how the substantive test of the ECMR should be strengthened deal with such situations. In particular, the question was asked whether the EC should switch and also adopt the SLC-test that is being used in the US. Following this consultation, on 11 December 2002, the European Commission proposed a far-reaching reform of its merger control regime in which, among others, it proposes a New Regulation in order to indeed strengthen its substantive merger test. Before discussing the test proposed by the Commission, we now discuss whether the test would make a difference.

European Commissioner Monti has suggested that the exact substantive test, or at least the wording of it does not make much difference. As illustrative evidence, he has pointed to the

fact that there have been very few cases of conflict between the US and the EU , and that even in cases such as GE/Honeywell, the conflict was not the result of the tests being different, but of the facts of the case being interpreted in a different way on different sides of the Atlantic (also see below). We would like to argue that the tests are very different and that the EC-test is really too weak. Of course, this value judgement relates to the goal one assigns to merger control. In our view, the goal of merger control should not simply be to prevent dominant positions being attained, but rather to prevent market structures in which competitive forces are too weak. The essence of merger control is to prevent mergers that would result in market structures in which competition would be significantly impeded. We remark that this is also the position taken by the European CFI. In Gencor v. Commission , the Court writes:

"106 (…) while the elimination of the risk of future abuses may be a legitimate concern of any competent competition authority, the main objective in exercising control over concentrations at Community level is to ensure that the restructuring of undertakings does not result in the creation of positions of economic power which may significantly impede effective competition in the common market. Community jurisdiction is therefore founded, first and foremost, on the need to avoid the establishment of market structures which may create or strengthen a dominant position, and not on the need to control directly possible abuses of a dominant position."

In our view, the dominance test is too weak to adequately deal with "non-cooperative tight oligopolies" and, for this reason, changing to the SLC-test would be desirable. At the same time we, however, note that the European Commission has a great deal of discretionary power, and that implementation of policy is already imperfect at the moment. The vagueness of the SLC-test, and the associated possible loss of some relevant (constraining) case law, would give the EC greater power to intervene than it currently has, hence, switching to the SLC-test might exacerbate the problems resulting from a too interventionist Commission. In fact, one might argue that this is an argument for retaining the current test. After all, the current test asks both the creation or strengthening of a dominant position and this to lead to competition being significantly impeded; it thus imposes a strict standard.

The proposal for a revised EC Merger Regulation

If, as we argue here, the essence of merger control is to prevent market structures in which competition would be significantly impeded and if the current ECMR is insufficiently powerful for this purpose, there seems an easy fix to the problem: it suffices to simply eliminate the reference to dominance in Article 2 of the current Merger Regulation, hence, the text would become:
"3. A concentration as a result of which effective competition would be significantly impeded in the common market or in a substantial part of it shall be declared incompatible with the common market."

In the proposal for a new ECMR , the Commission has not taken this route, although that it stresses, just like we do, that it should also able to tackle "non-cooperative mergers" in oligopolistic settings. Instead of deleting the word dominance from the ECRM, the Commission proposes to redefine the term. Specifically, the Commission proposes to add a new Article 2 to the Regulation, in which "dominance" is redefined as

"2. For the purpose of this Regulation, one or more undertakings shall be deemed to be in a dominant position if, with or without coordinating, they hold the economic power to influence

appreciably and sustainably the parameters of competition, in particular, prices, production, quality of output, distribution or innovation, or appreciably to foreclose competition."

Although the Commission remarks, in recital 56 of the proposed Regulation, that this proposed definition closely follows the characterization of a dominant position given by the Court, we are not entirely convinced by this. It seems to us that, since the concept is stretched to also include situations in which oligopolists do not coordinate their behaviour, adopting this Proposal by the Commission will have the consequence that dominance will come to mean something different in merger cases than it does in abuse cases, unless, of course, the concept of "oligopolistic dominance" would be stretched in these cases as well. As our discussion in the previous section has shown, such a strengthening would, however, be both unnecessary and undesirable. Given the decisions of the Court in cases such as Airtours, we also believe that the European CFI would be unwilling to stretch the definition in that direction.

Given that the Commission thus proposes in effect to adopt a different definition in merger cases than in abuse cases, we prefer to do away with dominance in merger cases altogether. In order to deal with the problem of discretion referred to above, we advocate using Merger Guidelines, just as is done in the US, and we are pleased that, as part of its comprehensive reform process, the Commission has indeed published draft guidelines for the appraisal of horizontal mergers. This notice is structured around the same five steps that we have encountered in the US Guidelines, with as additional element that buyer power is explicitly taken into account as well. While there are certain differences between these EU Guidelines and the US Guidelines (for example, the Commission states it is unlikely that it will challenge mergers with a HHI below 1000, where the "safe haven" in the US is somewhat more generous), in broad strokes, with the exception, possibly of the treatment of efficiencies, one may state that there is agreement between the two, at least as far as methods of analysis is concerned. Consequently, the Draft Commission Notice in effect describes that the Commission will be performing an SLC–test.

Perhaps this is not that surprising, as it has been claimed that the Commission may also in the past have been using this test. Whish (2001), for example, notes that, in Carrefour/Promodes the combined market share of the merging firms share stood at less than 30% and that still the merger was prohibited. Consequently, it is possible that, in some past merger cases, the Commission would have found dominance, where it would not so have concluded, had the case been one under Article 82.

6.4 Efficiencies

The second substantive issue on which the Commission's Green Paper invited views was the treatment of efficiencies in merger control. The Commission has frequently been criticized for not having a transparent policy with respect to this issue and, in the present consultation process, many respondents argued in favour of treating efficiency claims more explicitly. The Commission, however, decided not to honour these requests; in the proposal for the new ECMR, it writes that it is legally possible to deal with efficiency issues under Article 2(1) (b) of the ECMR, and consequently, the proposal is to leave this aspect unchanged. Article 2(1) (b), however, gives some rather general considerations, it states, among others, that, in making the merger appraisal, the Commission shall take into account "(...) the development of technical and economic progress provided that it is to consumer's

advantage and does not form an obstacle to competition". In reaction to the Proposal, several commentators have, therefore, argued that Article 2(1) (b) of the ECMR is not the proper place to incorporate efficiencies and that these should be taken into account in the substantive test, that is in the Article 2(3) and 2(4) of the Regulation. We are of the same opinion, but, if our analysis in the previous section is correct, then the issue is more semantic than of substance. This reading is also supported by the chapter on Efficiencies in the Draft Commission Notice on the appraisal of horizontal mergers. There we read, in paragraph 88

"The Commission considers any substantiated efficiency claim in the overall assessment of the merger. It may decide that, as a consequence of the efficiencies that the merger brings about, this merger does not create or strengthen a dominant position as a result of which effective competition would be significantly impeded. This will be the case when the Commission is in a position to conclude on the basis of sufficient evidence that the efficiencies generated by the merger are likely to enhance the incentive of the merged entity to act pro-competitively for the benefit of consumers, by counteracting the effects on competition which the merger might otherwise have."

On the face of it, this description does not seem to be different from the way efficiencies are handled in the US and one would hope that the Commission would adopt a similar position also in mergers that are not purely horizontal (see below). Of course, the Commission is right to insist, as it does in the Draft Commission Notice, that the efficiencies that the merging parties claim are verifiable, substantial, timely, merger-specific and of direct benefit to the consumers, but this is not different from the situation in the US.

GE/Honeywell

We conclude from the above that, on paper, it looks that in the future the EU merger policy will be very much like the policy in the US, hence, that there will be little scope for conflict. In the past, however, there has been conflict: in 2001, the US and EU competition authorities reached diametrically opposed conclusions in the proposed merger of General Electric with Honeywell; while this merger was unproblematic for the US authorities , it was blocked by the European Commission. We conclude this Section by briefly discussing this important case: how to explain that different conclusions were reached?

The essence of the European Commission's argument for blocking the merger was that, through packaged offers, the merged entity would be able to charge lower prices and, hence, to foreclose competitors from the market. At the same time, the US authorities viewed these efficiencies that the merged company was able to obtain as being pro-competitive. To appreciate these arguments, some background information on the players involved and the markets on which they are active is needed.

General Electric is a widely diversified industrial corporation, with revenues exceeding $ 125 billion in 2001. In the area of aviation, with which this case is concerned, it produces aircraft engines and it holds a dominant position on several of such engine markets. Through a joint venture with the French company CFMI, for example, it exclusively supplies engines for Boeing's B737. Competitors on this market are Pratt & Whitney (P&W) and Rolls Royce (RR). Honeywell is a leading avionics and technology firm, with revenues of about $23 billion in 2001, of which half came from its aerospace division. Give the breadth of activities of both these companies, there was a remarkable lack of overlap in their aircraft activities, consequently, the usual horizontal market power issues (elimination of a

competitor, thereby relaxing the competitive constraints and allowing increase in price) in this case were not of major concern. Instead, the focus was on “conglomerate effects”.

The European Commission claimed that, by combining the dominant position of GE in the aircraft engines markets with the leading position of Honeywell in several avionics markets, the merged company would be able to offer product packages at discount prices that rivals would not be able to match, and that as a result of that, these rivals would exit, thus leading to a strengthening of the dominant position of GE. In making this argument, the Commission also gave an important role to the financial strength of GE, as derived from its financial arm, GE Capital, and, in particular its important role in the purchasing, leasing and financing of aircraft. The following excerpts from the Decision illustrate the Commission’s concerns: paragraphs 351-355 of the Decision

“353. As a result of the proposed merger, the merged entity will be able to price its packaged deals in such a way as to induce customers to buy GE engines and Honeywell BFE and SFE-option products over those of competitors, thus increasing the combined share of GE and Honeywell on both markets.”

“355. (...) the merged entity’s packaged offers will manifest their effects after the merger goes through. Because of their lack of ability to match the bundle offer, these [i.e. the competing, VCRvD] component suppliers will lose market shares to the benefit of the merged entity and experience an immediate damaging profit shrinkage. As a result, the merger is likely to lead to market foreclosure on those existing aircraft platforms and subsequently to the elimination of competition in these areas.

To an economist, these arguments definitely do not suffice to block the merger: the goal of merger control is not to protect (inefficient) competitors. In fact, in this case, the Commission itself acknowledges that the costumers will benefit from the discount, but it is also worried that, by engaging in short term cost cutting, these customers will ultimately harm themselves:

“449. Airlines generally welcome the financial incentives that come with bundled offers. Given the very nature of their competitive environment, airlines are under great pressure in the short-term to keep their costs under control. Therefore, while airlines are likely to understand that their long-term interests would be better served through the preservation of competition among suppliers, each individual airline also has, and is likely to pursue, a short-term interest in achieving costs savings through bundled offerings.”

What is at issue here is the really fundamental question of the extent to which one can rely on markets being self-correcting: the more one is a market believer, the less one will be inclined to think that there will be a conflict between the short-term and the long-term. Related to that, should one act on the assumption that government officials are better able to take the long-term interests of costumers into account than these costumers themselves? Interestingly, in this case, the costumers were not opposed to the merger, but the competitors (RR in particular) forcefully made the above point. Why would one block a merger from which consumers do benefit? As pointed out already in the Introduction, in the US there is, generally, a stronger belief in the market than in the EU and, indeed, in the US, the same arguments led to the conclusion that the merger should be allowed, since it would lead to lower prices, and, hence, benefit consumers. In other words, in the US, the efficiencies obtained through the merger were considered as a pro, while in Europe, they were considered as a con.

The economist comparative advantage lies in his knowledge of the functioning of markets. He is trained not to believe in markets, but to evaluate them on their merits. While an antitrust economist may not have detailed knowledge of the markets relevant in this specific case, he may bring to bear models that allow one to get a better feeling for the forces that play a role. What about to make of the above arguments? Can the fears of the European Commission be substantiated?

As is known already from the work of Cournot, a merger of firms that active in complementary product lines, may allow them to reduce price, since, after the merger, they internalise externalities. Given price competition, competitors will follow by also reducing price, hence, overall prices will fall and consumers will benefit in the short run. What about the long run? Theory here is less developed and one has to rely more on intuition, aided by stylised ad hoc models that capture some relevant aspects of this case. If the merged entity is much more efficient than its competitors, then it might drive them from the market, and, theoretically, one could imagine that the firm might engage in foreclosure practises in order to speed up this process. Consequently, strengthening of dominance seems possible, but even in those cases, the welfare effects are ambiguous: the merger confers short-term benefits on consumers, while the long term effects are ambiguous, i.e. they depend on the model that is adopted. From an economic point of view, is that sufficient to block a merger? It hardly seems so.

In this specific case, a model was constructed in support of the argument of the competitors and the relevance of that model to the case at hand and for the decision to be taken was discussed extensively . In the Decision, the European Commission summarizes the role of economic analysis as follows:

"352. (…) The Commission has evaluated the theoretical premises of mixed bundling as presented to it in the economic analyses submitted by the parties and thirds parties. The various economic analyses have been subject to theoretical controversy, in particular, as far as the economic model of mixed bundling, prepared by one of the third parties, is concerned. However, the Commission does not consider the reliance on one or the other model necessary for the conclusion that packaged deals that the merged entity will be in a position to offer will foreclose competition from the engines and avionics/non-avionics markets.

In our view, the fact that one cannot rely on one or the other model does not imply that one should not take the lessons of these models to heart and that one can base one's decision on one's instincts.

7. Research agenda

This section sums up the discussion of this chapter. It does so by identifying research gaps in the various fields of interest.

1. The most striking and important research gap lies in empirical work on dominance. There is substantial empirical work on mergers, i.e. the consequences of mergers, but lots of other useful empirical work is needed, but lacking. In the light of the fact that judges require strong empirical foundation, the economic profession falls short of

proving competition authorities with sufficient tools and research. Just to mention a number of fields where empirical contribution will be helpful:

a. Importance of entry barriers. Entry barriers play a vital role in dominance issues, but there is hardly any clue how to assess the importance of entry barriers in a quantitative way.
b. Factors driving collective dominance (tacit collusion). Section 4 introduced a classification of market structure characteristics (necessary ingredients, important factors and other factors). The practical usefulness of this classification can be enhanced if it can be backed up with empirical work.
c. Assessment of government failure. From economic theory we know that government intervention is associated with social costs. It would be good if empirical studies are conducted that assess the importance of government failure under various market structural characteristics.

2. Role of experiments

One of the reasons that empirical studies have not yet generated strong detailed conclusions about the functioning of markets is that they need to measure a wealth of variables. Some of these variables, such as firms' cost structure and demand conditions, may be hard to measure. Moreover, economists have hardly control over the relevant variables. An environment in which the researcher is not confronted with these problems is the research laboratory. In the laboratory, subjects are confronted with oligopoly games of which the researcher knows the characteristics. Even better: the researcher has full control over these characteristics. Therefore, laboratory experiments can help to gain insights in the functioning of markets. This is in particular useful in assessing the importance of certain market structural characteristics, such as symmetry, transparency, the number of firms, pre-play communication and the like. There is already some experimental work on some of these issues[96], but clearly more work is needed.

3. Implementation

This chapter focused on economic analysis of dominance and government responses to anti-competitive conduct and mergers. Economists often ignore the practical problems that governments have when implementing policies. While there is a growing literature on implementation issues, such as pricing rules, leniency programs, agency problems and fighting facilitating practices, the development of (applicable) theory is in its early stages and much more can be done.

4. Applied theory on abuse

There are recent developments in the literature on predation, foreclosure, raising rivals costs and essential facilities, but much more can be done here as well. It would be particularly useful to study the relationship between certain market structural characteristics and the potential for the various types of abuse.

5. Ex ante versus ex post

[96] See Canoy and Onderstal (2003), Chapter3, for some recent references.

There are a number of overview articles discussing the relative merits of ex ante versus ex post intervention. Indeed, our section 2 also provides some general insights on this discussion. What is still lacking, though, are more concrete studies on this issue. One can think of international comparisons between markets which are regulated in one country but left to the competition law in another. One can think of markets that faces a shift in regime (typically from sector specific regulation into competition law). Another idea is to analyse the role of regulation on investment decisions and innovation.[97]

[97] See M. Cave et al (2002) for an example in the telecommunications sector.

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