Potential Competition: Theory, empirical evidence and legal practice

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Preface

Potential competition is a very important concept in the application of competition law. Most competition authorities, including the Swedish Competition Authority and European Commission's competition directorate, will base their assessments of mergers partly on how quickly existing or new firms can enter the market if the incumbents were to raise their prices. In the present report, Associate Professor Mats Bergman of ECON has surveyed the existing knowledge of the effects of potential competition, on behalf of The Swedish Competition Authority.

According to some theories in economics, potential competition is enough to limit market power even when one or a few firms has a very strong position in the market, in terms of actual market shares. Even a monopolist will be restrained by the mere fact that there exists a potential entrant. These theories, however, build on some rather restrictive assumptions. Most importantly, there must be low entry barriers, no sunk costs, and consumers must not be "locked in" with their present supplier. Because these assumptions rarely hold in practice, most theoretical, as well as empirical, studies conclude that potential competition is less effective than actual competition in restraining dominant firms.

In some circumstances, however, potential competition may be an effective restraint on the behavior of the dominant firm. An example is public procurements. If the government maintains the ownership of physical assets, and the procurement contract covers only the *operation* of those assets, potential competition is much more important than if ownership lies with the competing firms and the procurement covers both providing and operating the assets.

The Swedish Competition Authority believes that the present paper is a substantial contribution to the ongoing discussion regarding the effects of potential competition. The views expressed in this paper are those of the author and do not necessarily represent the views of The Swedish Competition Authority.

Jan-Erik Ljusberg

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1 Summary

Theory

According to the contestable-market hypothesis, potential competition is very effective, since it forces even a monopolist to set prices equal to average costs. However, that theory is dependent on a number of restrictive assumptions, e.g., that the entrant quickly can capture the whole market and that there are no sunk costs of entry. Although the development of the theory has provided valuable insights into the effectiveness of potential competition, it is nowadays thought that the theory as applicable only in special circumstances.

Possibly, the theory is applicable to some markets where long contracts are signed. One example would be long-term public procurement contracts where sunk costs are not important. That could be the case if the government maintain ownership of the physical assets and where the procurement contract only covers *operation* of those assets. This type of contracts have been signed for operation of underground trains and commuter trains, where the procurer maintains ownership of tracks, stations and trains. However, it appears that even in such settings, there are other types of sunk costs that may be important, such as investments in human capital and in computor systems. Nevertheless, potential competition is clearly much more important in such a setting, than it would be without procurement.

Another example of contracts markets where potential competition is important is the quickly growing market for private-label products for the food retail market. Normally, higher consumer recognition and an established reputation for quality favours the incumbent owners of the large brand names in consumer-products markets, and creates an entry barrier for potential competitiors. However, the large retail chains sell an increasing number of products, such as detergents, kitchen rolls and canned vegetables, under their own label. The products are purchased from producers that remain anonymous to the consumer, and are produced according to well-specified quality standards. The fact that the brand name is owned by the retail chain, not by the producer, makes each individual producer replaceable. If the producer tries to raise prises, it can easily be replaced by another producer that can meet the same quality standard.

In markets for homogenous products and services, and in markets for industrial supplies, it is often the large investment costs for building or redesigning production facilities that create entry barriers. A typical example

of a market with a homogenous product would be the electric utility industry; a typical industrial-supplies market would be the market for parts to the car industry. As discussed above, one method to make potential competition more effective would be to separate ownership of the assets from management of the assets. This may, however, not always be practical. When the producer must undertake significant R&D activities, it does not make sense to separate asset ownership from asset management. Another alternative would then be to make the supply contracts long enough that a potential competitor can bear the risk of building or redesigning production facilities or invest in R&D. For potential competition to be maximally effective, the procurement process must be timed so as to give new entrants time enough to build new electric utilities, to perform R&D or to set up the production facilities for a particular car part et cetera.

As seen by these examples, whether the contestable-market hypothesis is applicable to a particular market or not depends on the specific characteristics of that market. The sellers and the buyers in the market can influence the effectiveness of potential competition by strategically using brand names, the length of contracts or the allocation of ownership of physical capital.

According to the limit-pricing theory, the incumbent can keep entrants out of a market by lowering the price somewhat. According to this theory, potential competition will provide a competitive restraint for the incumbent, but less so than according to the contestable-market hypothesis. The incumbent will in many cases be able to earn substantial monopoly rents. Again, the theoretical foundations of this theory has been criticized, but modern and more robust versions of the theory have developed.

Potential competition is typically seen as something positive, but it can sometimes be negative. Potential competition can trigger wasteful or predatory actions by the incumbent firm or it can lead to excessive entry. The effectiveness of potential entry is related to the likelihood of entry, which in turn is related to the height of the entry barriers.

A large number of theories deal with various types of entry barriers. Entry barriers can be classified into administrative, natural and endogenous entry barriers. According to Sutton (1991), sunk costs are a fundamental determinant of industry structure. Sunk costs, in turn, are determined by the industry's technology and by its advertising intensity and R&D intensity.

Economic theory is inconclusive as to whether the incumbent or the entrants are more likely to produce a successful innovation in R&D intensive

industries. Similarly, theory is inconclusive as to whether monopoly is beneficial or detrimental for innovation.

Porter (1980, 1990) views potential competition as one of the fundamental forces that determine long-term industry profitability. Porter agrees with most economists in viewing the level of the entry barriers as critical for the effectiveness of potential competition.

Empirical evidence

There are relatively few empirical studies of potential competition. This is so for studies of the "pure" effect of potential competition, for studies of the likelihood of entry, as well as for studies of the effect of entry. The studies that do exist are concentrated to a few specific industries, e.g., the pharmaceutical market and the airline industry. The empirical studies suggest that entry barriers are critical for the effectiveness of potential competition. In addition, some studies have clearly demonstrated that the *identity* of the most likely potential entrant is important.

The empirical evidence suggests that potential competition is less effective than actual competition. However, as demonstrated by the mixed empirical evidence, the effectiveness of potential competition appears to depend on the specific circumstances.

Potential competition is of importance also because it increases the likelihood of entry. The likelihood of entry, in turn, appears to be strongly (and inversely) related to the height of the entry barriers. If entry do occur, prices are likely to fall.

Legal practice

The European Commission does not consider "potential competition" when it evaluates the relevant market, but it does consider "supply substitution". Here, "potential competition" is defined as supply responses that would occur within a year, but not *very* fast. Very fast supply responses are defined as "supply substitution". American antitrust authorities, on the other hand, do not consider supply substitution at all when defining relevant markets. On both side of the Atlantic, however, potential competition is an important factor when evaluating the competitive effect of, e.g., a merger. It is of less importance in *what* stage of the analysis potential competition (or supply substitution) is considered. It is, however, important that it is considered in *some* stage.

In merger cases, the most important factor when evaluating whether a dominant position would be created or not appears to be market shares.

The second most important factor appears to be the level of the entry barriers into the market. The former factor is related to actual competition, while the latter is related to potential competition. In some recent cases, the Commission appears also to have focused on the *identity* of the most likely potential entrant. This has been so in some cases where the existence of potential competition could sway the decision in a "negative" direction, i.e., towards blocking the merger. Compared with American (and Swedish) courts, it appears that the Commission has been relatively less inclined to view strong potential competition as a reason to *allow* a merger for high market shares. This appears to be the result of slightly different standards for blocking mergers. In the US, mergers can be blocked at lower *levels* of market power, while in Europe a smaller *increase* of market power is required. On the other hand, European competition law requires a higher level of market power for a merger to be blocked.

In Article 81(3) cases (exemptions), the Commission has looked at potential competition as a possible reason for not granting an exemption. When joint ventures are concerned, it appears that the Commission has closely analysed whether the mother companies have the technological capacity to be active in the relevant market on their own, i.e., whether they are potential competitors or not.

The on-going reform of the European competition rules, in particular the abolition of the notification and individual exemption system, will of course have implication for the application of Article 81(3). According to the reform proposal, Article 81(3) will be directly applicable, which means that the firms will not have to apply for exemption. This will shift the task of evaluating the pro and anti competitive effects of agreements between firms, from the Commission and the national competition authorities, to the firms themselves and their lawyers. However, this does not imply that the need to evaluate the effect of potential competition will be smaller in the future. On the contrary, the shift towards an economic evaluation of the effects of an agreement implies that the need to evaluate, i.a., the effect of potential competition is likely to be *greater*.

In general, it appears that both theoretical analyses and empirical studies suggest that actual competition is more forceful than potential competition as a competitive restraint on dominant firms. This provides a justification for the strong emphasis competition authorities put on market shares. Similarly, both theory and empirical evidence suggest that entry barriers are important

determinants of the strength of potential competition.

Perhaps to a lesser extent, it has been recognized that there are two sides of the coin, also when potential competition is concerned. Potential competition can, in itself, restrain the behaviour of the incumbent. However, the incumbent's reason to show restraint is of course that low prices (et cetera) will reduce the likelihood of entry. If price reductions become too aggressive, this has very much the flavour of predatory behaviour.

Even less attention has been paid to the notion that potential competition in itself can be excessive or detrimental. In industries with fixed costs, there can, conceivably, be too much entry. Alternatively, the threat of entry may trigger costly but socially unproductive responses by the incumbent, such as premature or excessive investments in capacity.

In conclusion, an analysis of potential competition is highly relevant in many competition law cases, including, in particular, merger cases and analyses of whether Article 81 applies to agreements between firms. Clearly, there are valuable insights to be gained from the academic literature in such situations. Both theoretical analysis and empirical studies are relevant. In the end, the conclusion must be drawn that it is imperative that the analysis takes the particularities of the case at hand into consideration, including, of course, the specific functioning of the market. Naturally, proper analytical tools must be used. A general recommendation for competition cases where potential competition appears to be important is that the possibility of using empirical analyses to evaluate the effectiveness of potential competition should be considered.

2 Introduction

For the purposes of this report, potential competition will be defined as the competitive pressure exerted on a market exerted by one or several firms that are not presently active in that market. Potential competition has a positive connotation: potential competition can restrain a dominant firm from exploiting its market power and will typically have the effect of reducing prices and improving quality and service. The positive effects of potential competition can come about in two principally distinct ways. First, the mere threat of entry can discipline the incumbent firm into reducing price and improving quality. Second, the existence of potential competition increases the probability that entry will occur; if entry occurs, competition may increase further, with further benefits for consumers.

That potential competition can be effective as a disciplinary competitive constraint, even for an incumbent firm that holds a monopoly, sounds like good news. However, the defensive actions taken by a monopoly threatened by entry are also known as entry deterrence - which has a negative connotation. Entry deterrence are activities by which an incumbent firm tries to block the entry of competing firms. These actions may be by price reductions, investments in production facilities, marketing or R&D, introduction of a wide variety of brands or product versions and so on. At least some of these activities are for the benefit of consumers, but they come at the cost of preventing the even greater benefits that would result from entry.

Hence, potential competition is closely related to entry. One of the ancestors of the Industrial Organization literature, Joe Bain, has expressed this relation in the following way: "the condition of entry, characterizing the extent to which established sellers have advantages over potential entrants, determines the relative force of potential competition as an influence or regulator on the conduct and performance of sellers in a market."[1] According to the influential writer on business strategy, Michael E. Porter, potential competition, in turn, is one of the five fundamental competitive forces, that determine firm profitability.[2]

However, there exists different views as to the effectiveness of potential competition. According to the contestable-market hypothesis, potential com-

[1] Bain (1968), p. 8.

[2] Porter (1980, 1990). The other forces are rivalry among incumbent firms, bargaining power of buyers, bargaining power of suppliers and the threat of substitute products.

petition is *very* effective. Even if an industry is completely monopolised, the existence of potential competition may be enough to force the monopoly to set competitive prices. According to the limit-pricing theory (or theories), potential competition is of some importance. Even though entry may be prevented by a limit price set by the incumbent firm, the price is at least reduced some way below the monopoly level. According to the critics of those theories, potential competition may not be important at all.[3] There are, goes the argument, no reasons for the incumbent to reduce prices in advance of entry. When a potential competitor decides whether to enter or not, it will rationally look at the market conditions that will prevail *after* entry, not at the price level before entry.

In competition law and competition policy, potential competition is typically seen as something good. Potential competition is, however, not considered when relevant markets are defined. On the other hand, it is an important factor when analysing whether the market is dominated by one or several firms.

In merger cases, potential competition can sway the decisions of the regulatory authorities either way. If a merger eliminates a potential competitor, this may be a reason to block the merger. Three such examples are the Commission cases *BOC/Air Liquide*, the *Telia/Telenor* and the *EdF/EnBW*. On the other hand, the existence of potential competition may be the factor that makes the authorities *allow* a merger. An example of this is the U.K. Competition Commission's decision in the *CHC Helicopter Corporation and Helicopter Services Group ASA* case, where a merger was cleared largely because of potential competition. In 1996, The Swedish Competition Authority asked the Stockholm City Court to block a merger between two processors of cinematographic films, *Skandinaviska Filmlaboratorier/FilmTeknik*. The request was rejected by the Court, on the grounds that actual and potential competition from foreign film processor was sufficient to maintain competition in the Swedish market.[4]

When evaluating agreements between firms, potential competition may also be of relevance. Article 81 of the EU Treaty applies to agreements that have as their object or effect to restrict competition; if the firms are neither actual, nor potential competitor, then an agreement between them will typically not restrict competition. Hence, the Commission's Notices

[3] See Dasgupta and Stiglitz (1988) and the discussion in Gilbert (1989a) , p. 485.

[4] For references to cases, see chapter 5.

on vertical and horizontal agreements applies to firms that are actual or potential competitors on one or several relevant markets. The Commission's opinion on what constitutes potential competition is expressed in the Notices and in the cases *Elopak/Metal Box - Odin.*, *Vacuum Interruptors II*, and *De Laval/Stork*. Conceivably, the existence of strong outside competition can be a reason to exempt an agreement between two firms that would otherwise dominate a market.

In the end, whether potential competition is a weak or a strong competitive restraint on dominant firms is an empirical matter. There exists relatively few empirical studies of the issue, and the existing studies gives somewhat contradictory evidence. However, the literature on entry and price-concentration relations can also shed light on the issue.

3 Theory

Economic theory describes, among other things, interaction between firms. One dimension along which such interaction can be categorised is the number of firms: from monopoly markets, over oligopolies to the numerous firms in perfectly competitive markets. Firm interaction can also be classified according to whether the interaction occurs between incumbent firms, between entrants and incumbents or solely between entrants. Combining the two dimension gives Table 1.

Table 1. Number of firms and type of interaction

Number of incumbent firms	Type of interaction		
	Incumbent only Incumbent vs. incumbent	Incumbent vs. entrant	Entrant vs. entrant
0	-	-	R&D-competition, investment races
1	Monopoly	Entry deterrence, Contestable markets[5]	-
Few	(Standard) Oligopoly	Entry, Entry deterrence[6]	-
Many	Perfect competition, Monopolistic competition	Free-entry long-run competition	-

[5] See also the literature on sequential entry, e.g., Vives (1988).

[6] For analyses of multi-firm entry deterrence, see Bernheim (1984), Gilbert and Vives (1986), Waldman (1987, 1991) and Church and Ware (1996). A typical result is that depending on the specific assumptions made in the model, there can be either under-provision or over-provision of entry deterrence, from the incumbents' perspective. See also the discussion in Gilbert (1989a), section 4.2.

In the table, the type of theories that are pertinent to a particular combination are indicated. For example, interaction between a few incumbent firms is described by oligopoly theory. Of course the table does not include all theories that may be relevant to a certain situation.[7] Note also that it is possible to make other delineations. For example, oligopoly theory is normally taken to include all situations where two, three or a few firms interact, irrespective of whether they are incumbents or entrants (i.e., oligopoly theory includes all cells in the third and fourth column). The point is that, by definition, potential competition is not an issue if there are no (potential) entrants. Furthermore, competition that occurs solely between entrants - R&D-competition, investment races - is usually not seen as potential competition. This leaves the middle column, where one or more (potential) entrants challenge one or a few incumbent firms, as the focus of the analysis in this report. The bottom cell in this row is a special case. In the long-run free-entry equilibrium, with competition between numerous incumbent firms and numerous potential entrants, potential competition is of course an essential ingredient. This issue, however, will not be further explored.

As mentioned in the introduction, different theories have different views as to the effect and effectiveness of potential competition. Below, some of the most important theoretical contributions that relate to potential competition will be surveyed.

3.1 The Contestable-market hypothesis

As an introduction to the contestable-market hypothesis, consider a perfectly competitive market. In such a market, firms and consumers are small and numerous (or, to be more specific, all sellers and buyers are price takers) and they produce a homogenous good. For simplicity, assume that they all employ the same production technology and that there are no fixed costs. Consumers have full information on price and quality, and choose to buy from the firms that sell at the lowest price (for a given quality). Consequently, a firm that sets its price above its competitors' prices will not be able to sell anything, while a firm that sets prices below its rivals' prices will capture the whole market. This means that firms will be forced to set price equal to marginal cost. (It can also be shown that under these assumptions and under the assumption that the markets are "complete", the outcome of the

[7] For example, R&D-competition can occur between incumbents and entrants.

market will be Pareto optimal. This is the First fundamental theorem of welfare economics.[8])

Next, consider the Bertrand model of price competition. (See also section 3.5.) Here, two or more firms that produce identical products compete in prices. For simplicity, assume again that the firms have identical cost functions and that there are no fixed costs. The consumers buy goods from the firm that offers to sell at the lowest price. If there are no capacity constraints and if the firms do not collude, competition between them will force them to set prices equal to marginal costs. That is, even though only two firms compete in the market, the outcome will be the same as in a perfectly competitive market.[9]

According to the contestable-market hypothesis (Baumol *et al*, 1982), under certain conditions, the same result carries over even to monopoly industries. An incumbent monopoly firm is sometimes completely unable to exploit its monopoly position, even if the market is characterized by increasing returns to scale. That is, in order to prevent entry, the incumbent must charge prices equal to average costs. Contestable markets are "efficient", in the sense that the market outcome cannot be improved on by regulatory interventions. This means, for example, that competition policy is redundant.

The conditions for this to hold are that the product is homogenous, that there are no sunk entry or exit costs, that the entrant has access to the same production technology and can buy inputs at the same price as the incumbent and, most critically, that the price charged by the incumbent is fixed for a longer period than it takes a rival firm to enter and capture the whole market.[10] Under the assumptions of the hypothesis, if the monopolist tries to set price above average costs, an entrant firm can offer to sell the product at a price below the monopolist' price, but still earn a profit. It will enter and immediately capture the whole market. Possibly, the incumbent monopolist will lower its price and recapture the market, but then the entrant can costlessly exit the market. This process is know as "hit-and-run" competition.

[8] See, e.g., Mas-Colell, Whinston and Green (1995), chapters 10 and 16.

[9] This is true in a static model, i.e., if the firms interact only once. If the firms sell in several periods, there are less competitive solutions to the "game". According to the "folk theorem", if periods are sufficiently short, it will be a Nash equilibrium for the firms to set any price between the competitive price and the monopoly price. See, e.g., Tirole (1988), sections 6.3 and 6.7.3.

[10] See Martin (1993), chapter 11, for a thorough discussion.

The contestable-market model was proposed as a bench-mark model that, although rarely an accurate description of actual markets, can serve as a useful instrument for analysing oligopolistic markets. Even though entry costs are never zero, they are small in some industries. Conceivably, the model could be a good approximation for such industries. (Just as the perfect-competition model is a reasonably good approximation for many industries with many sellers.) However, several authors have pointed out that if prices move quickly, relative to the time it takes for the entrant to capture the whole market, then even small entry costs are enough to drastically change the theoretical predictions.[11] If prices move quickly, then incumbent firms can earn supra-competitive profits without entry occurring.

The type of markets that most closely approximates the assumption of slow-moving prices appears to be markets where long-term contracts are signed. If the entrant wins the contract, the incumbent can not recapture the market for the duration of the contracts. However, most long-term contracts markets appear to violate one or several of the other assumptions. For example, most contracts markets involve fixed assets, the cost of which are at least partially sunk.

Some critics have focused on the capacity requirement: Which firms can reasonably be assumed to have the capacity to quickly serve the whole market - without incurring sunk investment costs? Cairns and Mahabir (1988) and van Wegberg and van Witteloostuijn (1992) suggest that the most natural candidates are incumbents in related markets. By re-directing their supplies, from their home market to the market into which they enter, they may be able to serve the entire market, without incurring sunk investment costs. However, unless they have excess capacity, so that both markets can be served simultaneously, there is an opportunity cost associated with re-directing supplies. Selling in the new market then means forgoing profits in their home market. This comes at a cost. Possibly, entry into the home market is induced by the firm's expansion into another market. This may further depress profits.

van Wegberg and van Witteloostuijn develop a symmetric duopoly model, in which two incumbent monopolies sell identical goods in two related markets. They show that if each firm has the capacity to serve both markets, and each can enter the neighboring market without cost, then the contestability

[11] See Farrell (1986), Gilbert and Harris (1984) and Stiglitz (1987). See also Paech (1998) for a discussion of the effects of introducing small entry and exit lags.

result holds.[12]

3.2 Limit-pricing and entry-deterrence theories

Another theory of potential competition is the limit-pricing theory (Bain, 1949, Sylos-Labini, 1962, and Modigliani, 1958). This holds that the incumbent firm can prevent entry - or slow entry down - by setting a "limit price", and then earn supra-competitive profits. The limit-pricing theory comes in a number of versions. According to the classical theory, the incumbent firm sets a "limit quantity", such that the residual demand is insufficient for the potential entrant to break even. In other words, the potential entrant observes what quantity the incumbent firm produces. When considering whether to enter or not, the entrant assumes that the incumbent will continue to produce this quantity, irrespective of whether it enters or not. This means that the entrant only can sell to the "remaining" consumers. If the quantity chosen by the incumbent is large enough for entry to be unprofitable (i.e., if what remains of the market after the incumbent has sold its quantity is too small), the potential entrant will abstain from entering. The critical quantity that is just large enough for this to be the case is called the "limit quantity". The price that corresponds to this quantity is known as the "limit price". This is the price that, according to this theory, the incumbent can charge. In this setting, the incumbent will be able to earn a supra-competitive profit.

Under the assumptions of the contestable-market hypothesis, no rents can be extracted from an incumbency position. Under the assumptions of the limit-pricing theory, on the other hand, the incumbency position can yield relatively large profits. The underlying reason for this discrepancy is that while the contestable-market hypothesis is essentially a two-period model of price competition, the limit-pricing theory (in its classical version) is a two-period model of quantity competition. Being the first mover in a game of quantity competition (or, more generally, with competition in "strategic substitutes") is advantageous, while being the first mover in a game of price competition (competition in "strategic complements") is disadvantageous.[13] This is fairly intuitive. If one firm gets to chose price first, this may in fact be favourable for the other firm, which can just undercut that price. On the

[12]Their model is related to the "multi-market contact" literature, e.g., Brander and Krugman (1983).

[13]See Tirole (1988), pp. 207-208, for a discussion of the concepts of strategic substitutes and complements.

other hand, if one firm gets to chose quantity, this is an advantage, since it can chose a relatively large quantity. The other firm will be forced by its own rationality to accommodate this by choosing a relatively small quantity. (See also the discussion in the following section.)

The contestable-market hypothesis has been criticized for being based on unreasonable assumptions - i.a., that the entrant can enter more rapidly than the incumbent can change its price. The logical weakness of the (classical) limit-pricing theory is that, once entry has occurred, it may be profitable for the incumbent to raise the price. Therefore, the entrant may have reason to believe that the threat of a low limit price is "empty", or "not credible". (The problems that arise when an agent have different optimal choices at different points in time are discussed in the next section.)

The limit-pricing theory presents an example of strategic entry deterrence. The incumbent takes actions that prevent potential entrants from entering the market. However, just as in all models of strategic entry deterrence, the incumbent has an incentive to act aggressively before entry only if this has an effect on the rival firm's entry decision. Otherwise, it should maximise short-run profits as long as it is alone in the market. Gilbert (1989a) has expressed this in the following way:

"Strategic entry deterrence requires an intertemporal linkage between actions that the incumbent may take prior to entry and the probability or extent of subsequent entry."

Such a linkage may not exist, if, as noted above, the entrant realises that the incumbent will not stick to its pre-entry quantity after entry has occurred. According to the classical limit-pricing theory, the incumbent sets a quantity (and a price) once and for all, which it maintain whether entry occurs or not. However, even though that quantity was optimal before entry, it is not optimal after entry.[14] This creates an inconsistency in the behaviour of the incumbent.

Spence (1977) and Dixit (1981) solve the inconsistency by assuming that the incumbent can sink costs by building capacity, which will lower the future marginal cost of production. This introduces a post-investment asymmetry between the incumbent and the entrants, which the former benefits from. If the entrant enters, it will have to pay, first, the cost of building the production capacity it chooses and, second, the marginal cost of producing the quantity it

[14]Friedman (1979). Strictly speaking, it is of course only optimal before entry if it succeeds in keeping the rival out.

chooses. On the other hand, at the time of entry, the incumbent has already built its capacity. Therefore, it only needs to calculate with the marginal cost of production. This means that, effectively, the incumbent has a lower marginal cost of production than the entrant. This, in turn, means that the incumbent will produce more and earn a higher profit than the entrant. There is a possibility that the resulting asymmetry in quantities will be large enough that the entrant will earn a negative profit, if it enters, even though it would earn a positive profit if it captured half of the market. In such cases, entry is said to be deterred by the incumbent.

Milgrom and Roberts (1982) address the weaknesses of the limit-pricing theory in another way. They assume that the entrant is uncertain as to the marginal cost of production of the incumbent. If this is sufficiently low, then the incumbent will be too tough a competitor for the entrant ever to profit from entering. If they are relatively high, on the other hand, it *is* profitable to enter. In Milgrom and Robert's model, the incumbent can "signal" its true marginal cost by setting a low price *before* entry occurs. This is so, since a monopolist with very low marginal costs of production will set a lower price than a monopolist with relatively high marginal costs. Hence, even if the monopolist has relatively high marginal costs, it can be profitable for it to set a low price before entry, since this will make the potential entrant believe that its marginal costs are low. Possibly, this will deter the entrant from entering. In that case, the incumbent will remain a monopolist, which increases its future profits. This may more than make up for the reduction of profits caused by setting a low entry-deterring price.[15]

Another strand of the limit-pricing literature introduces dynamic. Here, the incumbent does not deter entry altogether, but it retards entry in order to maximise its (discounted) profit. Gaskin (1971) develops a model, where the rate of entry depends on the price set by the incumbent. A high price means that the incumbent earns a high profit today, but that entry into the market is fast, so that it will earn relatively little in the future. A low price today reduces today's profit, but retards entry and increases future profits. A theoretical weakness of the dynamic limit-pricing model is that the behaviour of the entrant(s) is described by an ad hoc assumption, i.e., not based on profit-maximising behaviour. However, models along these lines

[15]This is an example of a "game of incomplete information". Cooper *et al* (1997) provide experimental evidence that support Milgrom and Robert's predictions.

have successfully been used in empirical studies of dominant firm pricing.[16]

3.3 Commitment and subgame perfection

This section explains the concepts of Nash equilibrium, subgame perfection and commitment. Readers familiar with these concepts can go directly to the next section.

One of the most important concepts for analysing markets with few firms - i.e., markets where competitive concerns are most likely to arise - is the Nash equilibrium, or NE.[17] A Nash equilibrium is a situation where the agents (firms, consumers, the government, nations et cetera) that interact, for example in a market, each chooses the action that is the best possible for themselves, given the choices of all other agents. A simple example is the choice of which side of the street to drive on. Given that everyone else drives on the right, the best choice (or best response) of an agent is also to drive on the right. However, if all others were driving on the left, driving on the right is not a good choice. Another way to express the same thing is to say that if everyone is driving on the right, no one has an incentive to deviate, by driving on the left.

In other contexts, it may be optimal to deviate from the behaviour of the others. For example, assume that several firms produce a homogenous good, at a marginal cost of, say, 1. Assume also that there are no capacity constraints. Consider then a situation where every firm has chosen to sell the good at a price of 10. Is this i Nash equilibrium? Clearly not. One of the firms could deviate, by setting the price 9. Since the good is homogenous and since there are no capacity constraints, this would allow that firm to sell substantially more. Given that the other firms continue to offer the good for a price of 10, it would be able to capture the whole market. It follows that the only NE is the situation where every firm sets the price 1.[18]

This type of "games" between firms are often represented by matrices,

[16] See Blackstone (1972), Brock (1975), Aronsson *et al.* (2001) and the discussion in Gilbert (1989a), pp. 511-515.

[17] Perfect-competition equilibria are also Nash equilibria.

[18] This is the argument that shows that in Bertrand competition prices will collapse to marginal costs. However, if the interaction between the firms is repeated, matter becomes more complicated and higher prices may be NE. Hence, the simple Bertrand model is most appropriate for situations where the interaction only takes place once - for example biddings for a unique project.

like the following:

		Entrant	
		Entry	No entry
Incumbent	Small quantity	1,1	2,0
	Large quantity	0,-1	2,0

The first figure in each cell represents the profit of the incumbent for the combination of actions taken by the incumbent and the entrant, and the second figure represents the profit of the entrant. For example, if the (potential) entrant does not enter, it will earn zero profit. If it enters, and if the incumbent chooses "small quantity", then it earns 1. If it enters, and if the incumbent chooses "large quantity", it will earn -1, i.e., a negative profit. The incumbent earns 2, irrespective of its quantity choice, as long as no entry occurs. If entry occurs, it earns 1 if it produces little, and 0 if it produces much.

If the incumbent chooses "high quantity", the best option for the entrant is to stay out. On the other hand, if the incumbent chooses "small quantity", the entrant should enter. Conversely, if the entrant enters, the incumbent is better off if it produces little, while if the entrant stays out, it is indifferent between producing much or little. In this game, there are two Nash equilibria.[19] In one equilibrium, the entrant stays out and the incumbent produces much. Neither party can profit from choosing the alternative action. In the other equilibrium, the entrant enters and the incumbent produces little. Also in this case, neither of the two firms can profit from choosing an alternative action.

The example given above corresponds to the limit-pricing theory. By producing much (the "limit quantity"), the incumbent deters the entrant. However, if the entrant makes its choice *before* the incumbent, then the analysis changes. Above, it was implicitly assumed that the two firms made their choices simultaneously. Given that it enters, the best response of the incumbent is to produce a small quantity. This allows the entrant to earn a profit of 1. Given that the entrant does not enter, the incumbent is indifferent between its two responses, but in both cases the entrant earns 0. Since 1 is more than 0, the entrant has an incentive to enter. This puts the incumbent

[19] Actually, there are three NE. Besides the two described above, there is one equilibrium in mixed strategies. This means that the incumbent randomises its choice between small and high quantity, and the entrant randomises between the choices of entry and no entry.

in a position where it is in its own interest to produce a small quantity, i.e., to "accommodate" the entry.

On the other hand, if the incumbent makes its choice before the entrant, things are again different. Given that the incumbent chooses a high quantity, the entrant stays out. This gives the incumbent a profit of 2. If the incumbent chooses a low quantity, the entrant enters. This gives the incumbent a profit of 1. Since 2 is more than 1, the incumbent chooses a high quantity, and the entrant stays out.

Depending on the sequence in which the firms make their decisions, we get quite different predictions. So which assumption is the right one? That depends on the specific circumstances in the case that we analyse. In most contexts, it appears natural to assume that the decision to enter is taken earlier than a decision to produce a certain quantity. An entry decision means acquiring licenses, building production facilities, hiring production and marketing staff et cetera. Unless production can be stock-piled, the decision to produce is likely to occur much later. Even if a firm announces that it intends to produce a certain quantity, this decision can often easily be revised later on - for example if entry occurs. From an analytical perspective, a decision is not taken before it has become irreversible.

Assume that the game between the entrant and the incumbent has the following timing. First the entrant decides whether or not to enter, and then the incumbent decides whether to produce a "small" or a "large" quantity. The entrant's quantity, given that it enters, is fixed.[20] A natural requirement for a "reasonable" equilibrium in a game like this is that, at all points in time, both firms make optimal choices. For example, when the incumbent has observed whether the entrant has entered or not, it adopts the action that is most favourable, given the observed choice of the entrant. This is the essence of an equilibrium concept called subgame perfection. Hence, the NE described above, where the incumbent chooses a large quantity, is *not* a subgame-perfect equilibrium. If the incumbent announces that it will choose a large quantity, and then the entrant enters, it will at that point in time be optimal for the incumbent to revise its decision, and instead choose a small quantity.

[20] A somewhat more realistic, and somewhat more complicated, game would be the following. First the incumbent decides on its production capacity. Then the entrant decides on *its* production capacity. Finally, both firms choose quantities (or prices), given their respective capacity choices.

As mentioned, the sequence of the moves in the game is given by the specific circumstances. However, sometimes one (or more) of the agents can influence this sequence. Specifically, an agent may be able to make a "commitment" to choose a certain action at a later time. In our example, the incumbent may somehow commit itself to produce a large quantity. For example, it may produce and then stock-pile its production for later sales. Alternatively, it could contract with the customers to deliver large quantities. Often, an effective "commitment device" is investments, in production facilities, in R&D or in marketing. In the models of Spence and Dixit, mentioned in the previous section, investing in production capacity serves as a commitment. It reduces the effective marginal cost of the incumbent, and makes it more aggressive than if investment decisions are taken later.

3.4 Entry deterrence and entry barriers

Fundamental for an incumbent's ability to deter entry is its ability to take actions *before* entry, that reduces the probability that entry occurs, or the extent of entry, if it occurs. Typically, these are actions that make the incumbent a tougher competitor - or that makes the entrant weaker. Some of these actions benefit consumers. For example, signalling low costs by selling at a low price will benefit consumers. Some actions will not benefit consumers at all, for example actions that increase the rivals' (entrants') costs. These actions can be seen as entry barriers, or more specifically as endogenous entry barriers.

Entry barriers can be classified into three categories: natural, administrative and strategic (or endogenous) entry barriers. Alternatively, natural and administrative entry barriers are together classified as exogenous entry barriers. Natural entry barriers are such barriers to entry that exist because of fundamental aspects of an industry's demand and supply. For example, there may be strong economies of scale, there may be large sunk costs associated with entry, the incumbent may have an absolute cost advantage (because of access to less expensive factors of production - e.g., lower wages - or superior technology) or the consumers may have high switching costs. Examples of administrative entry barriers are trade barriers, legal monopolies or entry restrictions, expensive government licenses and patents. Strategic entry barriers are actions taken by established firms that restrict entry. Examples are (low) entry-deterring prices, excess capacity, (excessive) marketing ex-

penses, (excessive) product differentiation[21], control over strategic resources and actions that raise rivals' costs.[22]

[21] See Schmalensee (1978). Judd (1985) argues that product proliferation may not be credible/subgame perfect. For empirical evidence, see Shaw (1982), Swann (1985), Smiley (1988) and Harrison and Harrison (2000).

[22] Another example is "limit qualities". Donnenfeld and Weber (1995) present a model, where the incumbent firms can choose the degree of product differentiation between their goods. In certain situations, they may choose a low degree of differentiation ("limit qualities"), so that price competition on the market will be intense. This will make it unprofitable to enter; hence entry will be deterred.

Table 2: Entry barriers

Exogenous entry barriers
- *Administrative entry barriers*
  - Tariffs and tolls
  - Non-tariff trade barriers
  - Legal monopolies
  - Entry restrictions
  - (Expensive licenses)
- *Natural entry barriers*
  - Returns to scale/natural monopoly
  - Sunk costs of entry
  - Absolute cost advantages (i.e., lower factor costs)
  - Consumer switching costs

Endogenous entry barriers
- Limit pricing
- Excess capacity
- (Excessive) product differentiation
- "Raising rivals' costs"
- Refusal to provide access to bottleneck facilities

The distinction between the different types of entry barriers are not always clear. For example, an administrative entry barrier may be the result of the incumbent's lobbying efforts (i.e., an endogenous entry barrier), it could be the result of a genuinely exogenous political decision or it may just reflect the existence of a natural monopoly. Similarly, incumbent firms could take actions that increase consumers' switching costs, for example by introducing loyalty schemes, by making products incompatible et cetera.[23] As a final example, refusal to provide access to bottleneck facilities is an (endogenous) entry barrier only if there exists large returns to scale (or even a natural monopoly) in some stages of the production. Hence, in certain cases switch-

[23] One mechanism, by which the incumbent can endogenously introduce switching costs, is to write "take-or-pay" contracts with the customers prior to entry. Such contracts oblige customers to pay a penalty to the incumbent, if they choose to buy from the entrant. This makes it more difficult to enter. Of course, the obligation comes at a cost. The incumbent must offer a lower price, but will, on the other hand, sell with a higher probability. This mechanism can be used by the incumbent to increase its own profit, at the expense of the entrants' profits. See Aghion and Bolton, 1987.

ing costs should be classified as endogenous entry barriers, rather than exogenous. As a final example, product differentiation may be the inevitable result of consumer demand and industry characteristic, in which case it should be seen as a natural entry barrier, not as an endogenous entry barrier.[24]

Sutton (1991) argues that a fundamental determinant of industry structure is the level of the sunk costs. If sunk costs are low, the industry will be fragmented, while high sunk costs will result in a concentrated industry. He considers investments in production facilities, necessary to reap scale economies in production, and investments in advertising and R&D expenditures as the most important sunk costs. The degree of scale economies, measured as the minimum efficient production level, i.e., the smallest size a firm (plant) can have and still produce at competitively low costs, is determined by technological factors. Such technologically determined scale economies are exogenous and independent of the market's size. Hence, industries where the sunk costs are predominantly investments in production facilities will tend to be more concentrated in small countries and on small markets than in large countries and on large markets. Advertising and R&D-expenditures, on the other hand, are endogenous choice variables for the firm and tend to increase with the market size. Hence, industries that are intensive in advertising and R&D can be expected to be concentrated also in large countries.

In general, there should be a relation between the level of entry barriers and the incumbent's ability to set prices above the competitive level. If entry barriers are low, prices should be close to the competitive level. If entry barriers are high, prices should be close to the monopoly level, while intermediate entry barriers should be associated with prices in-between the competitive level and monopoly prices. For example, in the absence of any entry barriers, the contestable-market hypothesis predicts that prices will be at the competitive level, even if there is only one firm in the market. However, if limit pricing or predatory pricing is used to deter entrants, then entry barriers may be high, although prices are kept at a relatively low level.

[24]For discussions of entry barriers, see, e.g., Stennek (1998), pp. 108-110, or Shepherd (1997), pp. 208-214.

3.5 Excessive entry and excessive potential competition

It has long been recognised that there can be socially excessive entry into industries with fixed costs (Dixit and Stiglitz, 1977; von Weizsäcker, 1980; Mankiw and Whinston, 1986). The reason is that the profit of the entrant comes from two sources. First, entry increases competition, which reduces prices and increases demand. This means that more social surplus is generated; some of which is captured by the new entrants. Second, there is a "business-stealing effect", whereby some of the profits that originally went to the incumbents now go to the entrant. The potential entrant enters if the sum of these two profit components is greater than the fixed cost of entry. However, only the increase in surplus represents a social gain, while the cost of entry is a social cost. This means that entry may occur even if this is not socially desirable. Such will be the case when the increase in consumer surplus is lower than the cost of entry, which in turn is smaller than the profit the entrant will earn.

Unrealised potential competition can be excessive in at least three respects.

First, the existence of potential competition may trigger entry-deterring strategies, as described above. Some of these strategies are for the benefit of consumers, e.g., limit-pricing. Other entry-deterring strategies, however, may only raise the costs of the incumbent, e.g., holding excess capacity. In extreme cases, the incumbent's profits may be completely dissipated, while prices remain constant. This means that, in some cases, potential competition will only have the effect of reducing welfare, by reducing firm profits.[25]

Second, an individual firm may have *less* incentives to enter, the larger is the number of (other) potential entrants. This is so, since (at least under certain assumptions) there is a greater risk that one or more other entrants will follow, leaving less profits for each entrant.[26]

Third, incumbent firms may, in certain situations, *raise* the pre-entry price in order to deter entry, when they face potential competition. This phe-

[25] Stiglitz (1981), Dasgupta and Stiglitz (1988).

[26] Dasgupta and Stilitz (1988), Nti (2000). See also references in Harrington (1987), p. 225. Nti develops a "contest model", where potential entrants can spend resources to increase their respective chances of winning the right to enter. This reduces the costs associated with simultaneous (excessive) entry, but introduces "contest costs". In either case, potential competition may *decrease* welfare.

nomenon may arises when there are more than one incumbent firms and when the entrants do not fully know the cost structure of the industry (when they have incomplete information concerning costs). Harrington (1987) shows that if the incumbent firms raise their prices, this will, given certain assumptions, make the entrants believe that costs are high in the industry, for the incumbents as well as for the entrants. This, in turn, makes the entrants believe that entry is unprofitable. Therefore, a high price signals *low* profitability, i.e., the converse of Milgrom and Robert's (1982) result. This means that the existence of potential entry *raises* the price in the market. Harrington also shows that in some cases, lower entry barriers or a larger number of potential entrants will raise the pre-entry price further.

3.6 Innovation and potential competition

What is the effect of potential competition on firms' incentives to innovate? This question has been addressed in the context of innovation competition between asymmetric firms.[27] The typical setup is one where an incumbent firm has access to a technology, which gives it a monopoly position in some market, but where there are prospects for improving this technology by innovation. Innovations can only be made after costly "R&D efforts"; such efforts can be made either by the incumbent firm, or by the potential entrant(s).

There are two basic paradigms for describing competition in innovation. According to the first paradigm, the firm that spends the most on R&D will (with certainty) be the first to innovate. This means that R&D competition will be very much like an auction, where the firm that spends the most "wins" the innovation. According to the second paradigm, increased spendings on R&D increases the likelihood that a firm will innovate, but the paradigm recognises that innovation is a random process, so that a firm that spends less on R&D than another firm may be lucky, and may be the first to innovate.

Gilbert and Newbery (1982) analyse competition in R&D between an incumbent, that currently holds a monopoly position, and a number of potential entrants. Using the first paradigm, they show that the incumbent will spend more on R&D and, hence, that it will be the first to innovate, so that it can maintain its monopoly. The simple intuition behind the result is that the incumbent has more to loose from entry, than the entrant has to gain by entering the market. This follows from the assumption that

[27] See Reinganum, 1989, for a review of the literature.

$\pi^m > \pi^e + \pi^i$, where π^m is the (incumbent's) monopoly profit, π^e is the profit of the entrant and π^i is the profit of the incumbent if there is entry. In words, the monopoly profit is higher than the sum of profits in a duopoly. The entrant can of course spend no more than π^e on innovation, while the incumbent can spend $\pi^m - \pi^i$, which, by assumption, is more than π^e. In equilibrium, the incumbent will spend (slightly more than) π^e and maintain its monopoly. In practice, this means that we should expect market leadership to be stable in industries that evolve rapidly by technological innovations. The potential competitors do have an impact - their presence increases the incumbent's R&D spendings - but we should rarely see potential competitors making significant technological innovations. This, however, is at odds with the conventional view of innovative industries: that market shares fluctuate a lot and that technological leadership passes between the firms. It does, however, have some relation to the "winner-takes-it-all" hypothesis, popular with advocates of the new economy.

Reinganum (1983) analyse R&D competition between an incumbent and potential entrants, but under the assumption of the second paradigm, i.e., that innovations are stochastic. She finds that if innovations are *drastic*, i.e., if a successful innovation allows the innovator to capture the whole market, then it is the *entrant* who has the strongest incentives to innovate. Hence, under these assumptions R&D intensive industries will be characterised by changing market leadership, rather than by cemented positions. Note, however, that for non-drastic innovations, the predictions are less clear. For marginal innovations, the incumbent will still have the strongest incentives to innovate. The intuition for Reinganum's result is the following. As long as there is no innovation, the incumbent will earn the monopoly profit, but the entrant will earn nothing. Therefore, the entrant has strong incentives to shorten the period before innovation occurs, by spending more on R&D. The incumbent, on the other hand, has no interest in shortening the pre-innovation period *per se*, but spends money on R&D only to preempt the entrant.[28]

As often, the empirical evidence that is available is rather inconclusive as to which of the two paradigms that best correspond to what we see in actual markets. According to Scherer and Ross's (1990) review, small (sometimes

[28] Chen (2000) analyses the issue of who wins the strategic bidding for a new market: the incumbent or the (potential) entrant. Chen assumes that entry may occur into a market that is *related* to the incumbent's market. Chen's contribution is that he considers the possibility of entry also into the incumbent's market.

entrant) and large (often incumbent) firms spend more or less equal fractions of their turnover on R&D, and are awarded patents more or less in proportion to their R&D spendings. However, there is no denying that entrant firms play an important role, and their policy recommendations are that "barriers to new entry be kept at modest levels" and "a subtle blend of competition and monopoly, with more emphasis in general on the former than the latter, and with the role of monopolistic elements diminishing when rich technological opportunities exist" [29]

As an alternative to spending resources on R&D, firms can obtain technology through licence agreements. This complicates the interaction between firms. A small literature studies the incentives for incumbent firms to license technology to potential entrants. The entrant can benefit from the arrangement, by savings on R&D expenses. If this eliminates the entrant's incentives to obtain a technology of its own, the competitive situation for the incumbent will be more favourable, and it can obtain a license fee. If there are several potential entrants, the incumbent can of course improve its own position by playing them off against each other. Such strategic use of licensing is studied by, e.g., Gallini (1984), Gallini and Winter (1985) and Yi (1999).[30]

3.7 Porter's "competitive forces"

The above discussion has focused on what the industrial organization literature has to say about potential competition. However, the question of potential competition borders into the area of strategic management theory. Porter (1980, 1990) has proposed an analytical scheme for evaluating the

[29] P. 660, see also pp. 651-660. The "role of monopolistic elements" refer to the Schumpeterian idea that innovations are spurred by (the prospect of) monopoly positions. The above discussion has focused on the issue of who wins the R&D race. The discussion of Schumpeterian competition is more focused on the issue of what market structure is best at stimulating innovation; Schumpeter's answer is that often a monopolisitc market structure is. However, most modern researchers into this issue agree that although this may be the case in some circumstances, there are both theoretical and empirical reason to believe that in other circumstances, the opposite is true. See Scherer and Ross (1990), chapter 17, Tirole (1988), chapter 10, and Cohen and Lewis (1989) for an introduction into this litterature.

[30] A similar idea is persued by Chen and Ross (2000) for (production) alliances, with applications to airline alliances in particular. The incumbent firm can "bribe" the potential entrant not to enter independently, by sharing its existing facilities at a low price. Hence, only a more limited entry will occur.

competitive situation of individual firms and within industries. According to Porter, there are five "competitive forces" that determine long-term industry profitability. These forces are: 1) the threat of new entrants, 2) the threat of substitute products or services, 3) the bargaining power of suppliers, 4) the bargaining power of buyers and 5) rivalry among existing competitors.

Porter's way of reasoning is very much in line with the way competition authorities view markets. The threat of substitutes, or substitutability, is the fundament for defining relevant markets, while rivalry among existing competitors is one of the bases for analyses of, for example, dominance in the defined market. Measures of market concentration and individual market shares are used as a first approximation of the intensity of competition and of dominance. The threat of new entrants (or potential competition) and the bargaining power of suppliers and buyers are used as additional indicators of the competitive pressure in the market. Of course, the perspectives differ, in the respect that Porter advises firms on what strategies they should deploy in order to be sheltered from the competitive forces, while competition authorities aim at maintaining the competitive pressure at a sufficiently high level.

While stressing that each firm has a unique optimal strategy, drawing on the firms' idiosyncratic strengths and adapting to its particular circumstances, Porter suggests three base strategies that can be used to improve a firm's competitive stance and increase its long-run profitability. The strategies correspond to the firm's positioning within the industry. The base strategies are 1) cost leadership, 2) differentiation from competitors and 3) focusing. Lower costs than the rivals (cost leadership) will of course confer competitive benefits, but successful differentiation may be equally - or even more - beneficial. Differentiation may be achieved by, e.g., superior quality or services, marketing that creates a unique image et cetera - so that the firm can sell its products at premium prices. A firm with a focus strategy deliberately chooses a narrow competitive scope, focusing on one or a few segments within an industry. It could use a cost focus strategy - i.e., aim at producing a narrow range of products at low costs - or it could use a focused differentiation strategy - i.e., aim at superior quality within a narrow range of products.

Porter argues that the effectiveness of potential entry depends on how high the barriers to entry are and on the incumbents' expected reactions to entry. According to Porter, the seven main barriers to entry are returns

to scale, product differentiation, capital requirement, customers' switching costs, access to distribution channels, government policy and cost disadvantages unrelated to scale. The latter can be the result of the incumbents having patents, favourable access to inputs, favourable locations, or a larger cumulated production experience ("learning effects"). Government policy includes entry restriction, licenses or subsidies to incumbent firms. By and large, these entry barriers have been discussed above, in section 3.4. Porter stresses that returns to scale typically is a more lasting entry barrier than the effect that comes from the incumbent's larger cumulated production experience. However, all types of entry barriers may be subject to change. For example, the returns to scale may fall drastically due to technological innovations.

How intense the incumbent's reactions to entry can be expected to be depends on the incumbent's reputation for "toughness" (acquired by aggressive action towards previous entrants), the incumbent's retaliatory capacity (e.g., financial resources and unused production capacity), the incumbent's dedication to the industry and on the industry's growth rate. The prospects for entry are poor in stagnant industries.

Most of Porter's general hypothesis concerning (for example) potential competition are based on research within the industrial organization literature. However, Porter supports his argumentation with numerous real-world examples, and stresses the importance of a thorough analysis of the industry at hand.

3.8 Conclusions

There are an almost uncountable number theories that relate to potential competition. Some theories predict a very strong effect of potential competition, some predict a moderate effect and some predict that potential competition will only have a very small effect - or perhaps no effect at all. Most theories assign a positive role to potential competition, i.e., suggest that potential competition increases welfare, through lower prices, higher quality, better service or wider product choice. Some theories, however, suggest that the existence of potential competition may actually *reduce* welfare - typically by triggering incumbent firms to engage in socially costly entry-deterring activities. Sometimes, however, even the entry as such can be detrimental to welfare. On the other hand, some entry deterring activities are beneficial. In fact, the low price achieved in a contestable market can be seen as an

extreme example of an entry-deterring price. In practice, it may be hard to distinguish between contestable-market pricing and predatory pricing.

Most theories single out entry barriers as the critical determinants of the effectiveness of potential competition. An important distinction is the one between exogenous and endogenous entry barriers. Endogenous entry barriers are created by the activities of the incumbent firm(s).

A general conclusion is that the effectiveness of potential competition depends intrinsically on the specific characteristics of the industry. How effective potential competition will be as a competitive constraint depends on the height of the (exogenous) entry barriers, on the incumbents' incentives to deter entry and on the direction of the possible entry-deterring activities. Which theory is the most relevant for the analysis depends on the idiosyncrasies of the industry and of the situation at hand.

This calls for a thorough understanding of the particular industry as well as for a general understanding of incentive mechanisms. It also calls for empirical evidence, which may help the analyst in the qualitative choice between different theories, and in the quantitative assessment of potential competition's effect.

4 Empirical evidence

Potential competition is based on a threat of entry. This threat may in itself provide a competitive restraint for existing firms, i.e., incumbent firms may reduce prices, improve quality and so on even though there is no entry, since there is a threat of entry unless they meet the customers' expectations. The threat of entry may also be realised. Thus, potential competition may result in actual competition. From an ex ante perspective (e.g., when a merger is evaluated), this second benefit can be decomposed into the probability of entry and the benefits that accrue if there is entry.

4.1 The effect of unrealised potential competition

The effect of unrealised potential competition can be studied in several ways. Stronger potential competition may reduce prices and profits, increase quality and variety, improve service, foster innovation and so on. In addition, if there are such effects, consumers' demand for the product should increase. How powerful potential competition is in real markets can in principle be subject to empirical analysis. Often, price is the variable that is the easiest to analyse. Normally, prices for individual products are available, although sometimes real transaction prices are not available. Profit levels can normally only be found at the company level, and hence reflect the firms' profits for all products. In addition, reported profit may differ substantially from "true" or "economic" profit. Quality, variety and service levels are often difficult to measure, but quantities are sometimes available.

The most direct method is to compare markets with different numbers of actual and potential competitors, and to evaluate if there are systematic differences in prices (quantity, quality, variety et cetera) between markets with or without potential competition. Alternatively, the same market can be studied over time, to see the effect of *changes* in the number of actual and potential competitors. It is normally relatively straight-forward to determine how many actual competitors there are in a market, and their respective market shares. However, it is often difficult to determine which firms that have the capacity to act as potential competitors - and to what extent. One approach, followed by Neal (1987) and Bergman and Rudholm (2001), is to use legal or regulatory restrictions to entry into certain markets. Neal makes comparisons across options markets, where certain options can be traded on one exchange only, while others can be traded on several exchanges - but are

in practice traded on one exchange only. Bergman and Rudholm use a panel dataset of pharmaceutical prices, where potential competition is assumed not to exist for the duration of the patent. At patent expiration, potential competition becomes possible, and in most cases there will eventually be actual entry.

4.2 The likelihood of entry and its effect

In principle, it is a simpler task to estimate the probability of entry and to identify the effect of actual entry, than it is to identify the effect of (unrealised) potential entry. It is much easier to identify actual entrants than potential entrants. Similarly, the probability of entry can be estimated, conditional on the characteristics of the market. Consequently, there exists a relatively large literature on the probability of entry. However, there appears to exist fewer studies of the effect of entry.

The likelihood of entry

Empirical studies of the likelihood of entry will typically estimate the probability of entry as a function of firm and industry characteristics. The measure of entry probability can be an aggregate measures, e.g., the number of entries into an industry or the entry rate. Alternatively, entry hazard rates can be estimated from individual observations of entry, i.e., from firm-level data. Often, industry variables that are thought to represent entry barriers are used as explanatory variables. For example, the sunk costs of entry has been represented by the capital-output ratio or by the product of the capital-output ratio and the minimum efficient scale. High rates of depreciation, a high fraction of capital being rented and a high fraction of capital consisting of equipment *reduces* the sunk cost, and hence increases the probability of entry.

Geroski (1995) reviews the literature on entry. He reports a number of stylized facts, including the following:

- Entry is common; the entry rate, measured as the number of new firms in a market divided by the number of active firms, varies between 2,5 and 15 percent for UK manufacturing. Entry *penetration*, i.e., the fraction of sales accounted for by new entrants, ranges from 1,5 to 6 percent.

- Entry rates varies significantly between industries, but the differences are not stable over time. The latter finding contradicts the hypothesis that high and persistent entry barriers makes entry into certain industries partic-

ularly difficult.

- The survival rate of entrants is low; most entrants exit relatively quickly and most of the surviving entrants capture market share quite slowly.

- Firms that enter by diversification are more successful than those that enter "de novo".

Sembenelli and Vannoni (2000) analyse firm-level data of the entry and exit decisions of large Italian manufacturing firms. They show that large and profitable firms are more likely to enter into new markets, and that entry is more likely into growing industries. However, profitable industries do *not* attract more entrants than other industries. Furthermore, firms are more likely to enter industries that are (upstream or downstream) vertically related to an industry in which the firm is already active. They are also more likely to enter industries that have similar levels of advertising and R&D intensity as the firm itself has and they are more likely to enter industries with similar levels of set-up costs as industries in which it is active.

The price effect of entry and exit

According to Stennek (2001), there are surprisingly few studies of the price effects of mergers. One industry that has been studied fairly extensively is the airline industry. There are studies of the effect of mergers as well as the effects of entry for the airline industry. The typical result is that after a merger, prices increase, and after entry, prices fall (see below).

Similarly, according to Thomas (1999), there are relatively few studies of the price effect of entry. Thomas studies the ready-to-eat cereal industry, and find that incumbent prices *rise* in response to entry. However, most instances of entry are new product introductions by firms already established in the industry, i.e., incumbent firms entering a new market segment. When outsiders enter, *large* (but not small) incumbent firms respond by reducing prices. Both types of entry (i.e., entry by incumbent firms into a new niche, as well as entry by outsiders) leads to increased advertising by the incumbents. Another industry where at least the effect of entry has been studied is the pharmaceutical market. Here, both positive and negative effects of entry on prices have been reported (see below).

4.3 The persistence of profit

An indirect way to analyse the effect of potential competition is to look at the profit levels. If profits are high in concentrated markets, this suggests

that potential competition is a weak competitive restraint. Although some studies show a positive relation between concentration and profit levels, other studies show the opposite, or no correlation. Hence, the empirical evidence on concentration and profits could be interpreted as support for the contestable-market hypothesis. Similarly, the reported profits in highly concentrated industries appear to be significantly lower than they *should* have been, had the firms had significant market power.[31] Again, a possible interpretation is that potential competition *is* effective as a competitive restraint.

On the other hand, the differences in profit levels between industries and firms that do exist are persistent. This suggests that entry barriers are of importance for the profitability of incumbent firms. This hypothesis is also supported by direct estimates of the effects of variables related to entry barriers on profitability. Examples of variables that have been shown to be positively related to profits are measures of scale economies and capital requirement, advertising intensity and R&D-intensity.[32]

Furthermore, it is well documented that a large fraction of the increase in profits that comes from market power is passed on to employees and other input suppliers. This has been shown for, e.g., the airline industry (Ng and Seabright, 2001). In other words, competition can be hampered and prices can be raised above the competitive level, without this being reflected in dramatically higher profit levels. In conclusion, it appears that studies of firm or industry profit levels do not give strong support to the contestable-market hypothesis. Instead, it appears that also this line of research points to the importance of entry barriers.

4.4 Concentration and prices

In a number of industries, it has been shown that prices increase with concentration.[33] Weiss (1989) surveys studies of the airline, beef slaughter house, cement, gasoline, retail food and railroad freight industries. Lamm (1981), Cotterill (1986), Asplund and Friberg (1999) and Claycombe (2000) study the retail industries in particular, with similar results, and Asplund and Sandin

[31] See Schmalensee (1989) for a survey of studies of the profit-concentration relationship.

[32] Schmalensee (1989).

[33] Given the finding that profits do *not* appear to increase when markets become more concentrated, this gives additional support for the hypothesis that profits are passed on to employees and other suppliers, or that profits are wasted in efforts to maintain the high level of concentration.

(1999) study the driving school market, again with similar results.

4.5 The airline industry

Joskow et al (1994) use a dataset of prices and quantities on 375 city pairs to address three pairs of questions. First, do supra-competitive prices lead to entry and do infra-compeitive prices lead to exit? Second, how do entry and exit, respectively, affect prices? Third, how do incumbents respond to entry and how do survivors respond to exit? In order to answer the first pair of questions, they model prices on the city-pair routes as a function of, i.a., distance. Prices above (below) the expected prices are seen as an indication of supra-competitive (infra-competitive) profits. They find that high profit levels (high prices) do *not* result in above average entry rates. They also find that prices fall about ten percent following entry (of one firm) and increase about ten percent after exit. Following entry, output increases with more than 50 percent, while exit results in an output reduction of around 20 percent. The incumbents' respond to entry by reducing prices about ten percent and maintaining their output; the survivors' response to exit is to increase prices with around ten percent and increase their output with around 20 percent.[34] The authors conclude that while entry is an important competitive force, potential entry cannot be counted upon to prevent price increases after mergers in the airline industry, since there is no tendency that supra-competitive prices lead to entry. On the contrary, their analysis indicates that mergers result in substantial price increases.

Morrison and Winston (1987) study changes in welfare as the number of actual and potential competitors changes. Welfare is calculated from a demand model for air travel and from an estimated cost function for airlines. An actual competitor on a city-pair route is defined as an airline that flies directly between the two cities, or that operates routes to both airports that connect at a third airport. A potential competitor on a city-pair route is defined as an airline that operate one or several routes to at least one of the cities, but which is not an actual competitor. By this definition, all routes have at least one potential competitor, since in their sample of 769 city pairs, there are no pair of airports that both are served exclusively by one airline. Their main findings were that both actual and potential competition increased welfare, but that one actual competitor was about three times as

[34] Kim and Singal (1993) get similar results.

effective as one potential competitor.

Peteraf (1995) also studies performance in city-pair air routes, but restricts her sample to routes where there is only one actual competitor. Her measure of excess profit is the price margin above the prices that would have prevailed if the industry still had been regulated, i.e., according to the formula used by the Civil Aeronautics Board to set prices before deregulation. In contrast to Morrison and Winston, she does not use the *number* of potential competitors, but dummies representing the existence potential competitors at each of the two airports ("EACH"), the existence of at least one potential competitor with presence at both airports ("BOTH") and whether at least one of the potential competitors is known as an aggressive price cutter ("PCUTTER"). An hypothesis is that potential competition on a route should be stronger if there is potential competition on both airports, and that the sunk costs of entry should be lower for airlines with presence at both airports. Hence, both EACH and BOTH could be expected to have a negative effect on the price margin. However, both variables significantly *increases* prices. Instead, PCUTTER has a strong and significant effect; when a known price cutter is a potential competitor, prices are on average five percent lower than otherwise. Peteraf interprets her results as contradicting both the hypothesis that the airline industry is perfectly contestable and the hypothesis that it is imperfectly contestable. If it were perfectly contestable, then PCUTTER should have no effect; if it were imperfectly contestable, then lower sunk costs of entry should reduce prices. The results are interesting, in that they suggest that the entrant's ability to be an effective competitor, if it enters, is at least as important as the costs of entry as such. In other words, not only the level of the entry barriers determined the strength of potential competition, but also the identity of the potential entrant(s).

4.6 The pharmaceutical industry

There are a large number of studies concerning the effect of generic entry on original-drug prices, as well as on the determinants of generic entry in the pharmaceuticals industry. The studies that focus on the US market before 1984 typically find no or very small effects of generic entry on the prices of the incumbent. In 1984, a reform reduced the sunk costs of entry. Grabowski and Vernon (1992), the first study of entry effects for the post-1984 period, find that generic entry *increases* the price of the incumbent. An explanation

for this phenomenon may be that there exists (at least) two segments in the market: one price sensitive and one price insensitive. After generic entry, the original manufacturers focus on the price insensitive segment of the market, leaving the price sensitive segment to the entrants. Suh et al. (1999) report that prices continue to increase after the patent has expired. See Aronsson, 2001, for a brief review of the literature. Aronsson et al. (2001) studies of the impact of generic competition on brand-name market shares for Swedish pharmaceuticals. They find, in contrast to some earlier studies, that generic entrants capture market share at a faster rate if the price differential between the original and the generic is larger.

Scott Morton (1999), Rudholm (2001) and Ekelund (2000) focused on the determinants of entry of generic products. The results indicate that entry by generic substitutes usually lowers the price of brand-name products, and that the most important factor in explaining entry is the expected profits of the potential entrants. For example, large pharmaceutical markets are more likely to attract entry. Another strand of the literature focus on strategic entry deterrence in pharmaceuticals markets. Ellison and Ellison (2000) study how marketing, product proliferation and pricing strategies affect entry by generic substitutes. In particular, they find that prices increase (relative to a pharmaceutical price index) during the final years of patent protection. After the patent has expired, prices fall for the group of pharmaceuticals where entry is predicted to be likely, and continue to rise for pharmaceuticals where the probability of entry is low or medium high.

Bergman and Rudholm (2001) explicitly try to distinguish between the effects of potential and actual competition. They assume that potential competition does not exist during the period of patent protection, but that it arises as soon as the patent expires. They use panel data with the prices of 18 original drugs during a period of up to 25 years to isolate the effects of patent expiration and generic entry. Their findings indicate that prices fall with about 5 percent in response to potential competition, and with a further 5 percent for each actual (generic) rival that enters the market. Hence, both actual and potential competition appears to be effective in this market.

4.7 Retailing

Carree and Thurik (1994) study the effect of incumbent, entrant and potential competition with a panel dataset of small Dutch retail firms in 36 different markets or segments (e.g., pet shops, menswear shops, ladieswear

shops, mens- *and* ladieswear shops et cetera). Their dependent variable is excess profits (defined as actual profits minus modal income[35]), and they use an error-correction model to analyse how profits return to the long-run equilibrium parity with modal income. They find that only the competitive pressure from incumbent firms influence profit levels. However, incumbent, entrant and potential competition are not measured in comparable units. Entrant competition is measured as the change in the number of firms that are active in the market; potential competition is measured as the gross number of firms leaving or entering the market; while the measure of incumbent competition is just the profit deviation in that market.[36] Hence, the measure of potential competition is really a measure of the height of the entry barriers, which, in turn, is related to potential competition. The effect of incumbent competition is treated as a residual, in the following sense: If Carree and Thurik's variables are able to capture both entrant and potential competition, then all competitive pressure that remain must be from incumbent firms.

Carree and Thurik's study gives some support to the notion that potential competition has *no* effect. At least, this appears to be the case for the profit levels in small-scale retailing.

4.8 Banking and financial markets

Devaney and Weber (1995) study the relation between changes in deposit growth and changes in concentration, for local rural US banking markets. Using a simultaneous-equation system, they find that growth in deposits reduce market concentration - i.e., promotes entry - and that increased concentration increases deposit growth. Their original hypothesis was that if the banking markets are not perfectly contestable, then *reduced* concentration should increase deposit growth - since increased competition should reduce prices and therefore increase the transaction quantity. On the other hand, if markets were perfectly contestable, then actual concentration should not influence the level of competition. However, as mentioned above, Devaney and Weber found the opposite relation, which does *not* support the notion that banking is less then perfectly contestable; they interpret the positive relation as an indication that there are returns to scale in this industry. However,

[35] Modal income is the most common income level.

[36] Cf. also Porters theory, according to which profit is a function of the competitive forces. Incumbent rivalry and the threat of potential competition are two of these forces.

they find some other evidence that the market is less than perfectly contestable. For example, liberalisation of state banking laws increase deposit growth. In conclusion, their study suggests that potential competition is relatively powerful in US retail banking.

A more direct measure of potential competition is used in a study by Neal (1987). He studies the bid-ask spread for stock options listed on one or more exchanges. On which exchange(s) an option is listed is determined by an "allocation plan", sanctioned by the US Securities and Exchange Commission. For more than half of those options that are listed for trade on more than one exchange, all actual trade occurs at just one exchange. For *all* options in the sample that can be traded on more than one exchange, at least 90 percent of the trade occurs at the largest exchange. Even so, the predicted spread for low-volume options with multiple listings is 20 percent smaller than for options with single listing. For high-volume options there is no effect of the number of listings on the spread. This is what can be expected, since higher volumes tend to reduce spreads, and since there is a minimum spread of one sixteenth of a cent. Since there is almost no actual trade on the second largest exchanges, no comparison can be made between actual and potential competition. However, the empirical facts conforms well with the contestable-market hypothesis: almost all trade occurs at the largest (most efficient) exchange, but there is a strong effect of potential competition on prices.

4.9 Auctions and bidding markets

Brannman (1996) studies the effect of actual, expected and potential competition in sealed-bid and oral auctions of US Forest Service timber. The extent of actual competition is measured as the number of bidders in a given auction. The expected number of bidders is obtained from a probit model of the number of bidders in a given auction - i.e., from a model prediction of how many competitors a firm would face in a given auction. The number of potential competitors is defined as the number of timber-purchasing firms located within 115 miles (about 185 kilometers) from the timber stand. Brannman's research agenda does not focus on the question how important potential competition is, relative to actual competition. Instead, he focus on whether the number of potential, the number of actual or the number of expected competitors has the best explanatory power in the model. Consistent with the theoretical predictions, actual competition is alone in affecting

prices in oral auctions, while potential and expected competition influence prices in sealed-bid auctions. However, contrary to the theoretical predictions, the number of actual competitors has the highest predictive power also in sealed-bid auctions.[37] From the parameter estimates, it appears that the effect on prices of one actual competitor is about twice as strong as the effect of a potential competitor.

4.10 Conclusion

The empirical support for the contestable-market hypothesis appears to be weak. For some industries, potential competition in its pure form, i.e., before entry has occurred, has been demonstrated to have some effect This appears, for example, to be the case for the airline industry and the pharmaceutical industry. However, as demonstrated by the mixed evidence also for these industries, the effectiveness of potential competition appears to depend on the specific circumstances. For example, it appears to matter *who* the potential competitor is. Similarly, the level of entry barriers into the market appears to be important.

Potential competition is of importance also because it increases the likelihood of entry. The likelihood of entry, in turn, appears to be strongly (and inversely) related to the height of the entry barriers. If entry do occur, prices are likely to fall.

[37] Brannman argues that this is an indication that collusion may be occuring in the sealed-bid auctions. However, he also stresses that, in general, collusion is more likely in oral auctions - and that there are other indications in this specific dataset that suggest that collusion may also be occuring in the oral auctions.

5 Legal importance of potential competition

5.1 Definition of potential competition

In the Commission Notice "Guidelines on Vertical Restraint" (2000 C 291/00), the following definition is provided: "A potential supplier [i.e., competitor] is an undertaking that does not actually produce a competing product but could and would be likely to do so in the absence of the agreement [between it and a firm that is active in the relevant market] in response to a small and permanent increase in relative prices. This means that the undertaking would be able and likely to undertake the necessary additional investments and supply the market within 1 year. This assessment has to be based on realistic grounds; the mere theoretical possibility of entering a market is not sufficient."

5.2 Relevant market, supply substitution and potential competition

In order to assess whether a certain conduct (e.g., an agreement between firms, a unilateral conduct or a merger) is consistent with the competition rules, the competition authorities need to define a relevant market. Only after the relevant market is defined can the analysis proceed with issues such as whether a dominant position is created or whether the agreement or the merger reduces competition. When a market is defined, the competition authorities typically looks at the substitutability between products of different brands/varieties, and between products sold in different locations. Products that are sufficiently close substitutes, product-wise and geographically, are said to be on the same relevant market. In other words, a relevant product market and a relevant geographical market is defined.

In the US Merger Guidelines, it is explicitly stated that supply substitution is *not* considered when the market is defined.[38] In the EU Commission's Notice on the definition of relevant markets, it is explicitly stated that supply substitution *should* sometimes be considered, although an analysis of demand substitution should form the basis for the market definition.

[38]US Horizontal Merger Guidelines, footnote 10. On the other hand, the Guidelines stresses the importance of a thorough analysis of whether the mitigating effects of entry are strong enough to offset the negative effects of the merger.

According to the Commission's Notice, in order for supply substitution to be considered, it must be sufficiently swift:

"This requires that suppliers be able to switch production to the relevant products and market them in the short term without incurring significant additional costs or risks in response to small and permanent changes in relative prices. When these conditions are met, the additional production that is put on the market will have a disciplinary effect on the competitive behaviour of the companies involved. Such an impact in terms of effectiveness and immediacy is equivalent to the demand substitution effect."[39]

According to the Commission, such situations typically arise when the producers sell a wide range of similar products which are not substitutable for an individual consumer. When suppliers can only switch production to the relevant market after significant adjustments of existing assets, after investments or other strategic decisions and only after a certain time delay, this is not considered as supply substitution, but it may be seen as potential competition.

This evaluation, in combination with the Commission's views on potential competition expressed in the Vertical Guidelines, provides an interesting delineation of potential competition: Potential competition is supply substitution that cannot occur more or less immediately, but which, on the other hand, occurs within a year.

5.3 Existence of a dominant position

When the relevant market has been defined, the analysis proceeds with the next step. In merger cases and in cases that concerns abuse of a dominant position, the next step is the issue of dominance.[40] Since the European Court's *United Brands* decision, dominance has been defined as:

"a position of economic strength enjoyed by an undertaking which enables it to prevent effective competition being maintained on the relevant market by giving it the power to behave to an appreciable extent independently of its competitors, customers and ultimately of consumers."[41]

Interestingly, before that decision, the Commission relied on a definition

[39] Commission Notice on the definition of the relevant market for the purposes of Community competition law, Official Journal: OJ C 372, 9/12/1997, at 19.

[40] I will not discuss collective dominance in this report.

[41] *United Brands*, (27/76) [1978] E.C.R. 207, para. 65.

that came closer to the economists' concept of "power to control price".[42] Korah (1997, p. 78) note that Court's definition focus more on a firm's ability to foreclose and exclude rival firms (i.e., an ability to prevent effective competition), than on its ability to exert control over prices. The recent development, with the introduction of the SSNIP-test and merger simulation methodologies, and with the growing critique against European competition law of focusing on protecting competitors, not consumers, may signal a reversion to the Commission's stance before *United Brands*.

In practice, the most important indicator of dominance is the firm's market shares. Obviously, such calculations are based on actual competition. However, the second most important factor is probably entry barriers. Clearly, entry barriers are closely related to potential competition, as discussed in section 3.4. Some importance is also attached to the *variability* in market shares, which is related to the level of entry barriers. In addition, *behaviour* is sometimes used as an indicator of dominance: certain types of discriminatory or exclusionary behaviour are supposedly only possible (rational) for a firm that holds a dominant position. Finally, the price and profit levels are to some extent used as indicators of dominance. Typically, one would expect a dominant position to be associated with prices above the competitive level and, consequently, with a high profit level for the dominant firm. Note the parallel to the structure-conduct-performance paradigm: market shares and (exogenous) entry barriers are structural factors; firm behaviour, including activities that raise endogenous entry barriers, are conduct factors; and prices and profits levels are performance factors.

5.4 Mergers

For a merger[43] between two firms to be incompatible with the European competition rules, two key criteria must be satisfied:[44]

- The merger must create or strengthen a dominant position
- As a result of which effective competition would be significantly impeded.

It has often been noted that, in practice, the distinction between these

[42] See *Continental Can*, [1972], C.M.L.R. D11, para. II.3.

[43] Here, the term "merger" is used, even though the term "concentration" is the one used in EC competition law.

[44] Council regulation No. 4064/89, article 2.3. In addition, criteria for minimum turnover, for concentration and for Community dimension must be satisfied.

two criteria is blurred. A factor that gives a firm with high market shares a dominant position (e.g., high entry barriers) is also a factor that gives this firm an ability to impede competition. On the other hand, as Stennek (1998) has pointed out, there is a clear analytical distinction between, on the one hand, the existence (or creation) of market power and, on the other hand, *increases* in the level of market power. It appears that while European competition law has required a relatively high *level* of market power (i.e., "dominance"), in order for a merger to be blocked, it has not required a large *increase* in that level. Potentially, this could be seen as an unmotivated asymmetry. Possibly, a large increase in the market power of a firm with a moderate market share could be as detrimental to welfare as a small increase in the market power of a firm that already had a strongly dominant position.[45] Interestingly, although somewhat outside the focus of this report, Swedish courts appear to have required a higher standard for the increase in market power. In other words, the Swedish cours appear to have required that there would have been a relatively substantial reduction in competition for a merger to be blocked.

The existence (or lack of) potential competition can sway the antitrust authorities' and the courts' view of a merger in two ways. First, the existence of strong potential competition after a suggested merger may make it possible to permit a merger that results in high market shares. This could either be because there will not be a dominant position, even after the merger, or because the competition will not be significantly impeded. Second, the elimination of potential competition due to a merger may make a merger incompatible with the competition rules, even though market shares do not increase significantly in any relevant market due to the merger. This could be the case if two firms that are active in related markets merge.

5.4.1 High-market-share-mergers accepted because of strong potential competition

Optiroc/Stråbruken

Optiroc and Stråbruken, the two leading Swedish producers of bricks, mortar, plaster and other stone-based construction materials, merged in 1997. The Swedish Competition Authority asked the Stockholm City Court

[45] The introduction of the concept of "collective dominance" has, to some extent, reduced the required minimum level of market power.

to block the merger, and, after losing this case, appealed to the Market Court.[46] The latter, however, confirmed the City Court's decision. The combined market shares in at least some of the relevant markets were found to be above 50 percent, and the Courts appear to have inclined towards accepting that this resulted in dominance. (The Authority had claimed market shares in the range 62 to 85 present for the different markets.) However, the Authority failed to convince the Courts that this would impede competition significantly.[47] To a large extent, this was because the Courts viewed potential competition as strong in these markets.

The Authority claimed that actual competition was not effective, for a number of reasons. The market shares of the competitors were small, in most cases less than ten percent, and the import ratio was low. The merging firms were the only firms that could offer a full product line. The acquiring firm, Optiroc, was owned by the Swedish monopoly producer of cement, which is an essential input for many of products concerned. Similarly, potential competition was not effective, for a number of reasons. Most significantly, the merging firms had strong brand names and, because of low building activities, there were a lot of excess capacity in the market.

Optiroc and Stråbruken claimed that the buyers of their products were retailers (almost three quarters) or building and construction firms (almost one quarter)[48]. Because of increased concentration in the downstream markets, the (balancing) market power of the buyers had increased. In addition, the increased scale of their operation enabled them to purchase the relevant products abroad. This would add transport costs corresponding to ten percent of the price of bulk products, but less for high-value added products. Potential competition was strong, because of balancing buyer market power and because of the relatively low costs of setting up production facilities in Sweden. Except for bricks, the cost of a production facility would be no more than 5-6 million SEK (about 600 000 euro). There existed several large European firms in the industry, which might be interested in establishing

[46]Swedish Competition Authority, case No 809/97, Stockholm City Court, case No. T 8-1002-97 and Market Court, case No. A 4/98.

[47]In addition, the Swedish Competition Act at that time required that a merger was detrimental from a general point of view. The Courts did not believe that the Competition Authority had demonstrated this. However, it is clear from the ruling that the Court did not even believe that it had been demonstrated that competition would be significantly impeded.

[48]In addition, a small fraction was sold to wholesalers.

a branch in Sweden. The merging parties denied that brand names had a significant effect in this industry. Finally, the prices of the products had fallen in recent years (relative to the CPI), Swedish prices were competitive in comparison with European prices and the profitability of the industry was poor.

These arguments led the Courts to accept the view that potential competition was a significant competitive constraint. Hence, the merger was allowed. Bernitz (1999) has argued that the Authority focused too much on establishing narrow product markets, which, if accepted, would have resulted in high market shares. On the other hand, he argues, the Authority should have made a more thorough investigation into the consequences of the merger on the competitive situation in the market. Bengtsson and Marell (2001) analyse the market structure two years after the merger. They find that prices have neither increased, nor decreased (relative to other buildings and constructions materials). They also find that no entry into the market has occurred. As a conclusion of their analysis, they stress that vague arguments as to the strength of potential foreign competition should not be accepted too easily.

Skandinaviska Filmlaboratorier/FilmTeknik

Another Swedish example of a merger for a monopoly-plus-fringe position that was allowed by the Courts is the 1996 merger between Skandinaviska Filmlaboratorier (and its subsidiary, Swelab Filmlaboratorier) and FilmTeknik.[49] Also in this case potential competition was an important issue. The relevant market was found to be technical services for cinematographic films, like developing and copying, in Sweden. In its request to the Stockholm City Court to block the merger, the Swedish Competition Authority argued that potential competition was not effective enough to make the merger innocuous. The authority stated several reasons. First, the laboratory, on the one hand, and the director and the photographer, on the other hand, need to cooperate closely - almost on a daily basis. The film must be returned quickly - preferably the following day. Hence, the geographical distance makes foreign laboratories less effective competitors. The language barrier adds to this problem. An evidence of the necessity of local presence that was demonstrated was the decision of two British laboratories to set up front-end laboratories in Manchester, Birmingham and Glasgow, to comple-

[49] *Skandinaviska Filmlaboratorier/FilmTeknik*, case No. 661/96, Swedish Competition Authority and The Stockholm City Court, case No. T 8-669-96.

ment their existing laboratories in London. Second, the price level for these services was twice as high in Sweden, compared to the level in the UK, even though the service level and the quality of service was superior in the UK. Despite this, only a small fraction of the Swedish films were processed in the UK. Third, the authority claimed that there were non-negligible costs associated with sending the raw films to British laboratories. Fourth, the establishing of a competing laboratory in Sweden was not a realistic prospect, because of the high investment costs in relation to the small size of the market. Fifth, the fact that the two merging laboratories were owned by a number of large firms, with large financial resources and which accounted for a large share of film production in Sweden, added to the risks of establishing a new laboratory. The Court found that the laboratories *would* attain a dominant position, but that the competitive pressure from foreign laboratories and certain domestic niche firms was sufficient to guarantee that competition would *not* be significantly impeded. The basis for these findings were not elaborated. However, the Court appears to have listened to the arguments of the merging firms. These, in turn, claimed that a growing fraction of cinematographic films were sent to the UK and that there were niche firms active in certain segments of the market. Hence, the market share of the merging firms would be a little less than 50 percent, not 100 percent as claimed by the Authority. In addition, the merging laboratories faced growing competition from the new video and digital film techniques. Furthermore, the British laboratories were able to develop films and deliver copies just as fast as the Swedish laboratories, the cost of sending the film to the UK was negligible and there did not exist a significant language barrier.

It appears that the best argument for not allowing the merger was the finding - not contested by the merging firms - that the price level in Sweden was twice that in the UK already before the merger, suggesting that foreign laboratories were not an effective competitive restraint. Furthermore, it appears as if the Authority made a tactical mistake in claiming that the market share of the parties would be 100 percent. The latter were able to convince the Court that their combined market share would be less than 50 percent. Hence, what the Authority viewed as potential competition was viewed by the Court as actual competition.[50] Perhaps the Authority would have been more successful if it had argued that the merging parties would

[50]Another way of expressing this is to say that the Court made a wider definition of the relevant market, including niche firms and imports of laboratory services into Sweden.

become dominant with a market share of around 50 percent, and if they had focused more on demonstrating the negative effects on competition of this. On the other hand, with regards to the precedence of merger cases under European competition law, it was not surprising that the Authority focused on demonstrating the existence of dominance.

CHC Helicopter Corporation and Helicopter Services Group

In the *CHC Helicopter Corporation and Helicopter Services Group ASA*[51], the UK Competition Commission allowed the merger between the two firms. Their subsidiaries, Bond and Brintel respectively, were two of the three firms that offered helicopter services to offshore oil and gas facilities in the northern zone of the UK sector of the North Sea. Hence, the merger created a duopoly. The reason for allowing the merger was twofold: the buyers in the market (oil companies) were large firms, and potential competition was considered as a powerful force in this market. That, in turn, was a consequence of the characteristics of the market.

There existed a pool of helicopter suppliers that operated in other markets, and that could potentially enter the northern UK North Sea sector. These potential entrants used the same technology as the merging firms and had similar costs. There were no substantial costs associated with entry or exit - the entry cost was estimated to be a few hundred thousand pounds. Perhaps most importantly, the market was a contracts market, with contracts that lasted at least three to five years, and which each gave the helicopter providers revenues of several million pounds. This suggested that the market would approximate the assumptions of the contestable market relatively well. This hypothesis was further supported by the empirical observation that prices were lower in the Norwegian sector of the North Sea, even though only two firms were active in that markets (as compared to three firms in the UK market).[52]

FTC vs. Promodes SA

FTC sought to block the merger between Red Food Store and seven supermarket stores owned by the Kroger Company.[53] However, although the merger led to a 67 percent market share of the Chattanooga supermarket chain market, the court allowed the merger because entry was expected to quickly reduce prices, if they were increased. In other words, the merger was

[51] The case is also known as *Helicopters II.*

[52] See Oldale (2000) for a discussion of the case.

[53] *FTC vs. Promodes SA*, 1989-92 Trade Cases, 68, 688, Northern District of Georgia.

allowed because of strong potential competition.

5.4.2 Mergers between firms in related markets blocked because potential competition would be reduced

Air Liquide/BOC

The Commission declared its intention to block the proposed merger between Air Liquide and BOC. The two firms are among the largest European producers of industrial gases, and are based in France and the United Kingdom, respectively.[54] Air Liquide did not operate on the British islands, while BOC had an "extremely strong dominant position" in the UK and in Ireland, with close to 100 percent of some markets. The Commission objected against the merger because it would have removed the most likely potential entrant into the British market. In addition, the merger would have created a uniquely strong European distribution network. This would have increased the entry barriers in a broader geographical area and would also have had the effect of reducing potential competition.

EDF/EnBW

The Commission raised strong objections against the acquision by EDF of EnBW.[55] EDF is the state owned dominant producer and distributor of electric power in France. Its market share is in the order of 97 percent. In addition, EDF has shareholding in power producers in more than ten other European countries. EnBW is a vertically integrated electric utility in the Southwest of Germany. EDF already controlled around 25 percent of EnBW, when it announced that it would set up a joint venture together with the largest shareholder, OEW. The creation of this joint venture constituted a concentration within the meaning of the Merger Regulation.

The relevant geographical market was found to be France. The Commission found that the entry barriers into the French electricity market were high. In principle, there are four ways to enter the market: by buying capacity, by building new capacity, by importing capacity into France and by buying power from other producers. A firm that adopts the last alternative will of course only establish itself in power distribution, not in power generation. The Commission argued that it was difficult to buy existing capacity.

[54] *Air Liquide/BOC*, Case No. COMP/M 1630, 18.01.2000. The case has not been published as of October 24, 2001. See, however, The XXXth Report on Competition Policy, 2000, The European Commission, at 266-267.

[55] *EDF/EnBW*, Case No COMP/M.1853, 7.2.2001.

Building new capacity would take a long time and would be very risky, because there existed excess capacity and because there existed no electricity spot market. Importing power was difficult, because of limited interconnection capacity and because balance power must be bought from EDF. Finally, relying on power from other producers would in practice mean relying on power from EDF, with obvious risks for the entrant.

EnBW is the third largest producer of electricity in Germany, but it had no activities in France. However, EnBW's main supply area border France and it owns two of the four interconnectors between France and Germany. In fact, EnBW is the only German interconnected electricity company that owns such interconnectors. In principle, EnBW could supply 10-20 TWh to France from Germany, corresponding to 2-5 percent of French consumption, or to 5-15 percent of the consumption of those consumers that had the right to freely chose whom to buy electricity from. The Commission argued that because of this interconnection capacity, EnBW was one of the three foreign firms that were best placed for entry into the French market - and perhaps even the very best placed. This conclusion was reached by a detailed analysis of the location and ownership of production facilities which potentially could be used for supply into France, as well as an analysis of access to interconnection capacity. A further argument for viewing EnBW as a likely potential entrant was its strategy of closing "pan-European supply contracts" with multinational firms. It already owned subsidiaries in several European countries, although not in France.

In addition, EnBW owns, together with two other firms, a controlling shareholding in the Swiss electricity company WATT, which in turn controls more than half of Switzerland's interconnector capacity with neighbouring countries. Because of its abundant supply of hydroelectric power, Swiss electricity producers are well positioned to supply peak load electricity to France. France, on the other hand, is dependent on Switzerland for peak load supply, because of its dependence on nuclear power.

The merger of EnBW would, according to the Commission, strengthen EDF's dominant position in France by removing one of the most likely potential entrants into France. Since EDF was already so extremely dominant on the French market, this reduction in potential competition was enough to cause serious concerns that competition would be significantly impeded. However, the parties submitted a number of commitments that removed the competition concerns. The main commitments were to relinquish EDF's con-

trol of the French electricity generator CNR, which has around four percent of the French market; to sell EnBW's 24.5 percent shareholding in WATT and to auction off power needed for setting up a virtual power plant in France. EDF agreed to auction capacity corresponding to four to five percent of the French market for at least five years. This would allow a competitor to build a customer base in anticipation of further liberalisations of the French market, but would of course allow EDF to act as the supplier of the virtual power plant.

Telia/Telenor

In 1999, Telia and Telenor notified the Commission of their intentions to merge.[56] Telia is the state-owned former telecom monopoly in Sweden and Telenor has a similar position in Norway. A large number of relevant product markets were defined, including provision of local loop infrastructure, provision of long distance and international infrastructure, subscriber access to telephony services, mobile telephony, business data communications, internet service provision, internet advertising and local telephone directory advertising. The geographic markets were in general defined as national markets. The market shares of the two firms in their respective home markets ranged from 50 to 100 percent for the various telephony markets, and were in some cases as low as 30-40 percent (internet service provision in Sweden) or even around 15 percent (internet advertising in Sweden).[57]

Not surprisingly, the Commission required the two firms to sell off their overlapping businesses, i.e., Telia's Norvegian daughter Telia Norge and Telenor's Swedish daughter Telenordia. The parties had already during the Phase I investigation offered to do so. However, the Commission argued that this would not be enough to off-set the anticompetitive effects of the merger, since Telia and Telenor were each other's "most significant and largest potential competitor[s]"[58]. The advantages their respective daughters derived from branding, technical and financial support, proximity of their respec-

[56] *Telia/Telenor*, Case No IV/M. 1439, 13.10.1999.

[57] I will focus on the telecom markets. However, both Telia and Telenor are active in several television distribution markets, e.g., cable TV and satellite TV distribution. There were no substantial horizontal overlaps in these market, since the geographical markets were considered as national. However, the vertical integration of Telenor's Scandinavian satellite business with Telia's Swedish cable TV network led the Commission to require that the parties divested Telia's cable TV operations. Hence, the Commission required that there should be no increases in market shares, calculated on a Scandinavian basis, although the relevant geographical markets were considered to be national (at 386).

[58] At 141.

tive supporting networks and the strong bargaining position achieved by being associated with a dominant incumbent in a neighbouring country made "Telia and Telenor unique as potential competitors" to one another.[59] The Commission agreed that neither party had a unique financial strength - there exists many larger international telecom companies. The claimed advantages derived from geographic proximity for branding and technical support were supported by the observation that most telecom companies tend to enter neighbouring markets first. However, in most product markets these claimed unique advantages were not reflected in the *actual* market shares. Although Telia was one of the largest competitors in many product markets in Norway, and, similarly, Telenor was one of the largest competitors in many product markets in Sweden, they were each other's *largest* competitor only in relatively few cases (e.g., in the market for business data communication in both countries and in the market for dial up access internet service provision in Norway). A theoretical argument supporting Telia and Telenor's unique ability to exert potential competition concerned what was coined "mutual dependency" (or "mutual moderation"). A certain fraction of Telia's international calls are terminated in Telenor's network, and vice versa. This gives the firms incentives to set relatively low access charges (which, in turn, could also benefit third parties).

There were some arguments as to why a merger between Telia and Telenor would raise entry barriers into the markets and reduce the effectiveness of actual and potential competition. The new entity would face lower marginal costs for calls between Sweden and Norway, since it would calculate with actual marginal costs, not access charges. Predatory (and costly) actions in one country would be perceived by potential entrants as increasing the risks of entry into markets in the other country; hence, predatory actions would be more effective in deterring entry. Because of more stringent local access rights in Denmark and Finland, than in Norway and Sweden, the new entity would have a unique ability to bundle services across the Nordic region.

In order to remove the competitive concerns raised by the reduction in potential competition, besides divesting overlapping telecom business, the parties agreed to undertake "local loop unbundling", i.e., they agreed to "allow competitors access to their local access networks in order to provide any technically feasible services on non-discriminatory terms".[60]

[59] At 142.

[60] At 381.

5.5 Exemptions from Article 81

An agreement can violate Article 81 of the EU Treaty if the parties of the agreement are actual or potential competitors. The Commission has expressed its general views on how to assess whether two firms are potential competitiors in the context of cooperative joint ventures that potentially violate Article 81 in its 13:th Report on Competition (1983). According to the Commission, two firms are potential competitors if they each have the financial and technical capacity to be active in the market and if they also have access to the necessary distribution channels.

Elopak/Metal Box - Odin

Elopak manufactured carton for liquid food (e.g., milk and juice) containers, as well as machines for filling these cartons aseptically. Metal Box was active in the markets for cans for foods and liquids, PET and polythene bottles and general plastic packaging for food and other products. Cans are typically sterilized, but Metal Box had the technology for aseptically filling a polypropylene container for milk. The two firms set up a joint venture, Oden, in order to develop an aseptic carton container with a metal lid, as well as the machinery for filling these containers. After its investigation, the Commission gave the joint venture negative clearance.[61]

The firms were found to be neither actual, nor potential competitors, since they were active in separate market and since they lacked the technological capacity of entering each other's markets. In addition, neither of the firms had the technological capacity to undertake the necessary R&D alone. The conclusion that the firms were not potential competitors were based on an analysis of their respective technological capacities.

Vacuum Interrupters

In 1970, General Electric Co. Ltd and Reyrolle parsons Ltd formed a joint venture for developing so called vacuum interruptors, a device used for interrupting heavy electric currents in switchgear for generating stations. Vacuum interruptors was a new technology, with potential benefits compared with traditional interruptors, where the high tension arcs were interrupted in oil, compressed air or inert gases. However, the manufacturing of vacuum interruptors presented significant technological challenges. The Commission gave the joint venture exemption.

[61] *Elopak/Metal Box - Oden*, 90/410/EEC Case No. IV/32.009. 13.7.1990. OJ L 209, 08/08/1990, p. 0015-0022.

In 1978, Brush Switchgear Ltd entered the joint venture as a partner. All three firms were large electric engineering companies, which each had the technological capacity of producing vacuum interruptors. Hence, again the Commission investigated the firms' technological capacity in order to determine whether they were potential competitors or not. However, even though they were found to be potential competitors, the new joint venture was exempted. This was due to the fact that there existed international competition, and to the fact that even for the three companies combined, the joint venture was just barely economically viable.

De Laval - Stork

De Laval, an American firm, and Stork, a Dutch firm, were both active in the markets for development, manufacturing and marketing steam turbines, centrifugal compressors and pumps used in, e.g., the electric utility, natural gas, petroleum and petrochemical industries. In 1973 the parties notified the Commission of an agreement between the firms and applied for exemption. The agreement set up a joint venture for design, manufacturing and marketing of the concerned products within the European Union, most other Western European countries and some other countries. The aim of the joint venture was to increase De Laval's presence in Europe and to expand Stork's business in the compressor and turbine markets. Know-how and immaterial property were transferred to the joint venture.

The Commission found that each firm had previously been active in most of the product markets throughout the world. In particular, De Laval had already exported the relevant products to Europe, while Stork had the economic resources and technological capacity of developing such compressors and turbines as it did not already sell. Hence, they were at least potential competitors and in many instances also actual competitors. In addition, both firms were large multinational companies. The fact that the joint venture was limited to a certain geographic area and the inclusion of certain additional restrictions on the activities of the parents further demonstrated that the firms were able to compete with one another.

However, in light of the relatively low market shares of the parties - 10 to 15 percent combined - the Commission concluded that the economic benefits resulting from the joint venture would be passed on to consumers, and that the joint venture would not enable to parties to eliminate competition for a substantial part of the products. The joint venture was exempted, after the parties had removed certain exclusivity clauses from the agreement.

5.6 Conclusions

To some extent, the principles for *when* to evaluate and consider potential competition in competition law are arbitrary. The Commission does not consider "potential competition" when it evaluates the relevant market, but it does consider "supply substitution". Here, "potential competition" is defined as supply responses that would occur within a year, but not *very* fast. Very fast supply responses are defined as "supply substitution". American antitrust authorities, on the other hand, do not consider supply substitution at all when defining relevant markets. On both side of the Atlantic, however, potential competition is an important factor when evaluating the competitive effect of, e.g., a merger. It is of less importance in *what* stage of the analysis potential competition (or supply substitution) is considered. It is, however, important that it is considered at *some* stage.

In merger cases, the most important factor when evaluating whether a dominant position would be created or not appears to be market shares. The second most important factor appears to be the level of the entry barriers into the market. The former factor is related to actual competition, while the latter is related to potential competition. In some recent cases (*Telia/Telenor, EDF/EnBW* and *Air Liquide/BOC*), the Commission appears also to have focused on the *identity* of the most likely potential entrant. This has been so in some cases where the existence of potential competition could sway the decision in a "negative" direction, i.e., towards blocking the merger. The Commission appears to have been less concerned with evaluating what the consequences of the diminished potential competition will be - at least in any quantiative sense. The underlying principle appears to be that when a firrm holds a "super-dominant" position, any reduction in the competitive pressure, no matter how small, is enough to justify blocking a merger. Compared with American and Swedish courts, it appears that the Commission has been relatively less inclined to view strong potential competition as a reason to *allow* a merger for high market shares. This is consistent with the different approaches in American and European merger regulation. In the US, focus lies on preventing mergers that significantly reduce competition, while in Europe, focus lies on preventing mergers that create or strengthen a dominant position. In other words, in Europe, blocking a merger requires that the *levels* of market power is high, but the required *increase* in market power is small. (Swedish courts appear to apply a double standard, in requiring both a high level of market power and a large increase of market power.)

Hence, for the Commission it suffices to establish that potential competition has (to some extent) been reduced, in order to block a merger. On the other hand, if actual competition is reduced, market power will typically increase at least somewhat, even if potential competition is very strong. Therefore, the existence of potential competition may not be enough to allow a merger, unless the potential competition is strong enough that no dominant position exists.

In Article 81(3) cases (exemptions), the Commission has looked at potential competition as a possible reason for *not* granting an exemption. When joint ventures are concerned, it appears that the Commission has closely analysed whether the mother companies have the technological capacity to be active in the relevant market on their own, i.e., whether they are potential competitors or not.

The on-going reform of the European competition rules, in particular the abolition of the notification and individual exemption system, will of course have implication for the application of Article 81(3). According to the reform proposal, Article 81(3) will be directly applicable, which means that the firms will not have to apply for exemption. This will shift the task of evaluating the pro and anti competitive effects of agreements between firms, from the Commission and the national competition authorities, to the firms themselves and their lawyers. However, this does not imply that the need to evaluate the effect of potential competition will be smaller in the future. On the contrary, the shift towards an economic evaluation of the effects of an agreement implies that the need to evaluate, i.a., the effect of potential competition is likely to be *greater*.

6 Discussion

In general, it appears that both theoretical analyses and empirical studies confirms that actual competition is more forceful than potential competition as a competitive restraint on dominant firms. This provides a justification for the strong emphasis competition authorities put on market shares. Similarly, both theory and empirical evidence suggest that entry barriers are important determinants of the strength of potential competition. For good reasons, the contestable-market theory, which suggests that potential competition is *very* effective, has not had a large impact of the competition authorities' practices. The possible exception is contracts markets with low sunk costs. Again, this is consistent with both theory and empirical evidence.

Perhaps to a lesser extent, it has been recognized that there are two sides of the coin, also when potential competition is concerned. Potential competition can, in itself, restrain the behaviour of the incumbent. However, the incumbent's reason to show restraint is of course that low prices (et cetera) will reduce the likelihood of entry. If price reductions become too aggressive, this has very much the flavour of predatory behaviour.

Even less attention has been paid to the notion that potential competition in itself can be excessive or detrimental. In industries with fixed costs, there can, conceivably, be too much entry. Alternatively, the threat of entry may trigger costly but socially unproductive responses by the incumbent, such as premature or excessive investments in capacity.

There are relatively few empirical studies of potential competition. This is so for studies of the "pure" effect of potential competition, for studies of the likelihood of entry, as well as for studies of the effect of entry. The studies that do exist are concentrated to some industries, e.g., the pharmaceutical market and the airline industry. However, also the empirical studies suggest that entry barriers are critical for the effectiveness of potential competition. In addition, some studies have clearly demonstrated that the *identity* of the most likely potential entrant is important.

In conclusion, an analysis of potential competition is highly relevant in many competition law cases, including, in particular, merger cases and analyses of whether Article 81 applies to agreements between firms.[62] Clearly, there are valuable insights to be gained from the academic literature in such

[62]The on-going US Microsoft case illustrates that potential competition can be highly relevant in monopolization cases.

situations. Both theoretical analysis and empirical studies are relevant. In the end, the conclusion must be drawn that it is imperative that the analysis takes the particularities of the case at hand into consideration, including, of course, the specific functioning of the market. Naturally, proper analytical tools must be used. A general recommendation for competition cases where potential competition appears to be important is that the possibility of using empirical analyses to evaluate the effectiveness of potential competition should be considered.

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